**negotiating futures**
**design fiction**



n|w University of Applied Sciences Northwestern Switzerland
Academy of Art and Design

6th swiss design network conference 2010

# negotiating futures — design fiction

Basel – Switzerland

SWISSDESIGNNETWORK

*The Sixth Swiss Design Network Conference* **A half decade of Swiss Design Network** *by Martin Wiedmer*

The Sixth Swiss Design Network Conference returns to Basel in 2011, having been the original venue for the first symposium in 2005. Other venues have included Zürich (2006), Geneva (2007), Bern (2008) and Lugano (2009).

The core question after 5 years should be if there has been an objective change over this period. Obviously, my answer is yes, and I notice an enormous shift on different levels.

(1) The SDN Conference has become a relevant reference point for the design research community in Switzerland and its publications are today an essential archive for our researchers. Numerous citations in the Swiss and international community make this visible. In spite of the diversity of addressed topics, of different involved design fields and of controversial understandings of research and design, the Swiss Design Network is the main actor contributing to an already existing image of something which is called ‹Swiss Design Research›.

(2) In the last conference, held in Lugano, another major step in design research became visible: the new master programmes in design within Switzerland. The introduction of research oriented MAs became a boost for focusing research and are a proof of concept, concerning strategies for research and for whole institutions. Previously, research activities were mainly limited to externally financed projects; today the universities are obliged to transfer knowledge from research to education. This year's conference takes this development into account and offers the Junior Researchers a special conference day.

The next step we must take is to promote doctoral programmes in our field. The arguments for this are very clear: we are acting today in an academic system with a severe system failure. There is no PhD in Design in Switzerland and the only way to reach this goal is a political one. This is our common challenge over the coming years.

(3) In comparison to other associations and networks in our heterogeneous research field, we will find another distinctive feature of SDN, which was supported by the activities of our network. It is the fundamental assumption that Visual Communication, Industrial Design, Interior Design, Critical Design, Experience Design, Interaction Design, Architectural Design and others share common knowledge in practice, theory, thinking, doing, creating, prototyping, inventing and so forth. The SDN asserts a shared interest in questioning design as a process concerning all kinds of design fields. The SDN does not focus on one single area of design but offers a platform to bring together knowledge, experience and insights from many different design disciplines.

(4) Furthermore, I observe a consolidation of identified positions within the ongoing discourse about research understandings, methodologies and methods. The quality of this discourse has increased enormously in the last few years. The beginning of our conference series was strongly based on a meta level addressing epistemological and methodological issues in our field. Today our knowledge about design and design research is based on completed research projects. Our standpoints are rooted in experience and not in general assumptions.

This year's conference: Design Fiction. Negotiating Realities.
One specific standpoint will be investigated in this year's SDN conference.
One current controversy in research and design research is about two perspectives: scientific research as a constructive and creative practice and, on the other hand, design and design research as a focus on the world as it could be. As a consequence of this, the core question is how fictions are designed by researchers and designers and how the multiplicity of possible new futures is negotiated and realized. Focusing on the methods, processes and strategies is obviously not limited to design researchers. The question of how to disclose new realities is a productive intersection for practitioners in design and art, but also of other kinds of actors in practice, theory, research etc.

Design, following Herbert Simon, is about changing situations into desirable ones. Design as a ‹science of the artificial› is questioning how the world ought to be, in relation to interacting with the present.

In fact, this question of how to create possible futures is strongly connected to negotiations and politics in existing situations. Finding appropriate methods to face controversial contexts and challenges – climate change, financial crises and embodied technologies – is one of the core challenges of our world today, involving all of us, here and now.

This hybrid constellation between research as a creative activity and design, in a broad sense, as making proposals of how the world could be, is visible in our program in multiples senses.
The keynote speakers are experts from multiple fields: Design History, Product

Design, Technology, Art, Marketing and Theoretical Physics. They represent a whole array of several disciplines, maybe with severe distinctions of their understanding of what they are doing. Nevertheless, my hope is to avoid the discussion of ideologies when comparing disciplines and practice in general and to open up a multidisciplinary platform in order to identify relevant strategies relating to the core conference topic.

On another level, the conference is a hybrid of different kinds of tracks showing implicitly that designing fictions and negotiating realities are grounded in different kinds of practices, in a fuzzy zone of knowledge production, including research and design as creative practice and in a world where boundaries between the scientific lab and the world increasingly disappear. Hence, we combine in our program the presentation of completed design research projects in the call for papers track, insights into ongoing research, design and art practice in parallel workshop sessions, project presentations from MA students in the pre-conference and, last but not least, the keynote speakers in the plenary session: Ruth Durrer, Marc Duseiller and Alexandra Midal on the first conference day titled ‹negotiating futures›; James Auger, Julian Blecker and Franz Liebl on the second day titled ‹design fiction›.

*Martin Wiedmer, design researcher, lecturer and architect. President Swiss Design Network and Head of Institute for Research in Art and Design IDK, HGK FHNW, martin.wiedmer@fhnw.ch*

Introduction

8 *The Sixth Swiss Design Network Conference* **A half decade of Swiss Design Network** *by Martin Wiedmer*

Keynotes

1st Day

18 *Swiss Design Network Conference 29.10.2010, Introduction to the 1st conference day* **Negotiating futures** *by Flavia Caviezel*

20 *Ruth Durrer* **Creativity in Art and Science: similarities – differences**

22 *Marc R. Dusseiller* **Transdisciplinary Approaches on Education at the NanoBioInterface**

24 *Alexandra Midal* **Design and science fiction: all that glitters is not gold.**

2nd Day

38 *Swiss Design Network Conference 30.10.2010, Introduction to the 2nd conference day* **Design Fiction** *by Simon Grand*

42→II *James Auger* **Alternative Presents and Speculative Futures** *Designing fictions through the extrapolation and evasion of product lineages.*

58 *Julian Bleecker* **Design Fiction: From Props To Prototypes**

68 *Franz Liebl* **The Strategic Value of Art:** *What Strategic Management Can Learn From Leadership Hacking*

Papers

80 *Björn Franke* **Design Fiction is Not Necessarily About the Future**

92→VI *Russell Loveridge* **Fantastic Form**

106→VIII *Mònica Gaspar Mallol* **Displaying f(r)ictions.** *Design as Cultural Form of Dissent*

118→X *Regina Peldszus, Hilary Dalke* **Spaceflight Settings as Laboratory for Critical Design**

134 *Betti Marenko* **Contagious Affectivity.** *The Management of Emotions in Late Capitalist Design*

150→XI *Jan Eckert, Marco Mason* **From Social Relevances to Design Issues**

158→XII *Annina Schneller* **The Visual Rhetoric of Public Transport Information Design**

170→XIV *Thomas Müller, Gregor Naef, Andreas Simon* **A Kid's Interface: Designing a Keyboard for Two Year Olds**

184→XVI *Anusha Iyer, Dries De Roeck* **Empowering people to connect & create with smart technology**

194→XVII *Chris Hand, Anab Jain, Tessy Britton, Graham Burnett, Darryl Chen, Christopher Collett, Sanjiv Sharma, Charlie Tims, Liam Young* **The Power of 8: Encouraging Collaborative DIY Futures**

1st Day


208 **Mobile Access to Knowledge: Afrofantasy** *Davide Fornari, Iolanda Pensa*

209 **The Ideal Form – a statistical approach to the prediction of good design** *Michael Kangas, Beat Karrer*

209 **The Everyday Story of Imaginative Time & Space** *Austin S. Lee, Yuseung Kim*

210 **Standard MisDelivery AD 2025** *Ko Nakatsu, Eric Lai*

210 **Curious Interface** *Carina Ngai, Bao Vo*

211 **Bio-Conscious Design Fiction** *Stijn Ossevoort*

211 **The Process of Image Generation as Model of Imagination** *Michael Renner, Nicolaj van der Meulen*

212 **Design Learning Futures – principles and practices of design studio education in the 21st Century.** *Nicole Schadewitz, Steve Garner, Jennefer Hart*

212 **UPGRADE – Perspectives on Corporal Design** *Christoph Zellweger*




2nd Day


214 **Generative and Analog Ornament** *Antonino Benincasa, Jörg Gleiter, Matteo Moretti*

215 **Gender specific end-user experiences inspirational for visual communication?** *Olivia Blum, Cecilia Liveriero Lavelli, Fred Voorhorst*

215 **Phenomenology of Atmospheres** *Alain Findeli, Noëlle von Wyl*

216 **Creative Processes in Collaborative Design of Software Applications** *Claudia Iacob, Li Zhu*

217 **Undesigned for: re-thinking interactions through game-play design** *Vanessa De Luca, Serena Cangiano, Irina Suteu*

217 **NONOBJECT Design** *Branko Lukic*

218 **Using Failures in Design Fictions** *Nicolas Nova, Julian Bleecker*

218 **Historical Graft – a workshop redesigning the past** *Johnathan Puff*

219 **Versus – Diagrams and visualization to observe social Complexity** *Donato Ricci, Giorgio Caviglia, Gaia Scagnetti, Daniele Guido*

220 **How We May Work – Plexwerk as an experimental space for services and products of instant spectacular production.** *Mischa Schaub, Benjamin Schmid, Nicole Wuest*

Images →**I—XXIII**



# Negotiating futures

*by Flavia Caviezel*

Almost simultaneously possible future scenarios are being discussed in Basel: while the first day of the SDN symposium with the theme ‹Negotiating futures› brings together three experts from science, art and design, two days later the Basel city president and an ETH engineer exchange during the Climate Exhibition ‹2°› ideas on Basel's future life in 2050. These differing viewpoints represent a spectrum of what bothers a society in the confrontation with future issues. Although the questions and approaches may be very different, they have something in common: they imagine, design and create future scenarios, oscillate between ‹factual› and ‹fictive› phenomena, and move, alike science fiction writers, starting from present perceptions towards possible, desirable or avoidant models of possible futures.

How such creation processes look exactly is a central theme of the first conference day. The keynote speakers Ruth Durrer, Marc Dusseiller and Alexandra Midal talk about what can be observed in the outline of future scenarios in science and art/design, which methods and procedures are applied and which significance models and simulations may have.

In the work of Ruth Durrer, professor of theoretical physics at the University of Geneva (http://theory.physics.unige.ch/~durrer), creativity in scientific work is central, as the development of a new theory always requires a step outside of the pre-designed path. Also speculation is necessary, because in physical experiments hardly any conditions can be fulfilled. From partly speculative models emerge tests supporting or refuting these models. At that point the inter-relations of ‹fact› and ‹fiction› become visible whereby the conditions of their creation is of interest. In science, the experimental fact always enables at least in principle a check of the theories of physics. Does it apply to art as well, respectively is this it's concern at all?

Situated in the cross-field of these debates is Marc Dusseiller's inter and transdisciplinary work. Located between Nano-Science and Electronic Arts he knows and combines scientific and artistic practices (www.dusseiller.ch). Project initiatives such as ‹Hackteria – Open Source Biological Art› stand for an open approach with knowledge about procedures and technology. Hacking is understood as a procedure that looks for witty, subversive solutions. This know-how is passed by networks and cooperations of the so-called do-it-yourself movement (DIY) of artistic experimental electronics and expanded continously through new experiments. In this field of different methods and procedures, which represent Dusseiller's spectrum, technology is a central issue, as well as in the experimental settings of physics. However, not technical sophistication but simple comprehensible processes are sought – as they are also found in building instructions such as ‹Werkbuch für Jungen› (Workbook for Boys) from the 1960s, which are not consulted without irony. Technology should be freed from the illusion of perfection and transferred from digital computational into sensually analog worlds, which is vividly communicated also to children and young people using soldering irons and electronic material in DIY workshops.

Looking back into the history of design, done by the design historian, design theorist and curator Alexandra Midal, shows a desire to perfect the existing technological possibilities to open up new, even galactic spheres. She considers the developments in design as parallel to those in science fiction, where imagined future scenarios rely again and again on recent scientific and technological developments and their anticipated opportunities and threats to society. In Midal's exhibition ‹Tomorrow now – when design meets science fiction› (www.egodesign.ca/en/article.php?article_id=108) she discussed these relationships in connection to important events: the written word formation in the 19th century, the New York World's Fair in 1939 (with the ultra-modern city model *Futurama* as main attraction), a new understanding of space after World War II (Cosmonautics) or theories of the fourth Dimension (parallel worlds), such as discussed for example in the famous U.S. TV series ‹Star Trek› with time travel, teleportation and other physical ‹still-impossibilities.›

The fact that science fiction in the fields of activity of Durrer and Dusseiller always generated productive interactions, is another example that the view back into the past is relevant when dealing with future scenarios: historical reassessments or revisions allow negotiation on their alternative view basis.
In the case of design history, a revision would entail a new understanding of design, as Midal states, namely one, that is thinking design in relation to science fiction, not only historically, but also currently.

*Flavia Caviezel, ethnologist, film scientist, videast. Researcher and lecturer at IDK, HGK FHNW. www.likeyou.com/flaviacaviezel, flavia.caviezel@fhnw.ch*

Ruth Durrer University of Geneva, Switzerland,
Ruth.Durrer@unige.ch

# Creativity in Art and Science: similarities – differences

Ruth Durrer

Dr. Ruth Durrer is professor of theoretical physics at Geneva University and Head of the department. Her research interests include cosmology and high energy physics, the cosmic microwave background, cosmic magnetic fields, braneworlds, gravitational waves, and dark energy. She has written the book ‹The Cosmic Microwave Background›, published over 100 refereed papers, many conference proceedings (http://theory.physics.unige.ch/~durrer/publications.html) and is Associate Editor of the journals ‹General Relativity and Gravitation› and the ‹Journal of Cosmology and Astrophysics› (JCAP). She teaches and supervises PhD students and post-doctoral fellows at the Institute of Theoretical Physics. Ruth Durrer was the coordinator of different professional networks for many years and co-organized several conferences and schools. During her academic career she has received a ‹Young researchers stipend› (Swiss National Science Foundation) and the ‹Schläfli Award› (Swiss Academy of Sciences). She has been visiting professor at different universities in the US, UK, in France and Italy.

I think it is clear that both, artistic and scientific activities require most of all creativity. I shall attempt to define creativity in my talk, show how it is needed in art, and especially in science. I shall illustrate in a couple of examples how creativity enters in scientific work and how the development of a new theory always requires a step outside of the pre-designed path. In science, the experimental fact always enables us to at least in principle check our theories. Is such a check also possible in art?

Marc R. Dusseiller Switzerland, dusjagr labs, marc@dusseiller.ch

# Transdisciplinary Approaches on Education at the NanoBioInterface

Keywords: Art-Science Collaborations, Education, Creativity, Nanotechnologie, BioInterfaces, DIY

The scientific and technological endeavours currently being conducted on the scale of a few nanometers has led to a merging of disciplines from biology, physics, material science and engineering. At the nanometerwide interface of technological artefacts to living systems various phenomena occur that needs a broader approach for understanding, manipulation and utilization. To be able to conduct such transdisciplinary research projects new ways of communication and collaboration are now being established, which also need to be founded on new methods in education for young scientists. While these future hybrid-devices are being promised to lead to magnificent improvements of quality of life, sustainability or market potential, they also raise fears and misconceptions in the general public. I will try to conclude from personal experiences in educational projects with students in lifesciences, game-designers, artists and children, how these issues can be approached. During collaborations between artists, designers, hackers and scientists, we have developed new concepts, which include hands-on, interactive experimentation combining technology and living systems, methods of cultivating creativity across disciplines and public dissemination of Bio- and Nanotechnology.

Marc R. Dusseiller

Marc R. Dusseiller is a transdisciplinary scholar, lecturer for micro- and nanotechnology at FHNW, cultural facilitator and artist. He works in an integral way to combine science, art and education. He performs DIY-workshops in lo-fi electronics, music and robotics, has made various short movies. He is currently developing means to perform biological science in a DIY fashion in your kitchen or your atelier and is the co-founder of hackteria, open source biological art. He is also co-organizing Dock18, Room for Mediacultures, and various engagments like the diy festival, national and international workshops for both artists, schools and children as the president of the Swiss Mechatronic Art Society, SGMK.

Alexandra Midal Professor of history and theory of design HEAD-Geneva, alexandra.midal@orange.fr

# Design and science fiction: all that glitters is not gold.

Keywords: Science fiction, fiction, design, predictions, Futurama, Gernsback, Ballard

Design and science fiction? How can one conceive of the hypothesis of relationships between two disciplines which are apparently – alien, one from the other? I will get closer and examine the relationships that they maintain with one another from their early forms till today. Both were born in the 1840's as printed matter in England. And later, the ‹heroic› and ‹pioneer› design figure of William Morris, revealed to be the unexpected sci-fi writer of ‹News from Nowhere› (1893). From birth of design with Morris to the futuristic obsession drive of the Americans Streamliners whose creative peak was 1939's New York World Exhibition, and until Marti Guixé 2009's invitation to a psychic to predict the future of design, the association of the two terms is far more than coincidental. So, why such a remarkable relation? Especially if as some wonder, does the future still have a future? Likewise sci-fi, and through the creation of limitless spaces, another history of design needs to be written in its association with the scope of speculation and fiction.

*«Most science-fiction predictions have turned out to be false [...] Of course, H.G. Wells did predict the atom bomb, while other writers predicted our society of overconsumption. [...] But science fiction has generally been wrong about the future [...] for me, science fiction is dead. Is there a future for the future?*
*– No.»*[1]

It is in these definitive terms that James Graham Ballard, the author of *Vermillion Sands, Millenium People* and *Crash* and one of science fiction's most celebrated writers, lambastes the association of the future and science fiction. More precisely, he sees the conquest of space and the July 1969 moon landing as the death knell of the idea of the future. Unlike Philippe Starck's exhibition *La Tentation de l'espace*[2] [The Temptation of Space,] in which he promised interstellar trips in the near future (with the help of Richard Branson), Ballard asks: «Did the future arrive too early, somewhere around the middle of the century at the peak of modern science fiction?»[3] And has it become obsolete? Nevertheless, numerous are the designers who claim the existence of links between prediction and design, like Denis Santachiara for whom the origin of the Italian word for design, ‹progettare›, originally signified a projection into the future. Santachiara also draws a parallel between technology, design and science fiction to define his chosen profession in the following terms: «Technology is not a service, but a language of the senses and a hypothesis, which is the designer's own mode of expression. Playing with science fiction is part of this same logic and due to this is extremely important.»[4] The position taken by Ballard, however, is far from an ambiguous provocation, thanks to it freeing science fiction from the chance circumstances of futurology – the ‹-ology› with which it is normally associated – and its stress on another dimension of critical nature, the same one claimed by design. Continually reshaped by attacking the dialectic of the neo-avant-garde, of the utopic/distopic duo usually deployed, Banham's contradictions propose a singular and subtle reconfiguration of science fiction which refuses to congeal, ready to expand as the site of ongoing struggle.

## Dreaming the Dream of the Future

*«Even today, the future could be anything, provided that there's an aileron on top.»*[5]

The first read of the terms ‹design› and ‹science fiction› dates to the 19th century. But, there were earlier works of science fiction – in the 17th century, the famous Cyrano de Bergerac wrote: *Histoire comique des Estats et empires de la Lune* (1657) and, later, Jules Verne successfully published *De la Terre à*

1 James G. Ballard, «Y-a-t-il un avenir pour l'avenir. « Les débats de l'Obs (2006 February 16-22.): 100.

2 La Tentation de l'espace, Espace Louis Vuitton, Paris, June - August 2007. Exhibition incl. works by following artists: Davide Bertocchi, Mathieu Briand, Russel Crotty, Pierre Huyghe, Yves Klein, Jean Larivière, Nicolas Moulin, Yutaka Sone, Philippe Starck & Virgin Galactic, Jane and Louise Wilson.

3 Ballard, Millénaire, Mode d'emploi, (Auch: Tristram, 2006).

4 Denis Santachiara, La Neomerce, (Milan, Paris: La Triennale, Centre Georges Pompidou,1985), unpaged.

5 Ballard, «Cabaret cosmique.» Op. cit.

*la Lune, Trajet direct en 97 heures 20 minutes* (1865) or Albert Robida and his *Le vingtième siècle: la vie électrique* (1890) – but it was Hugo Gernsback, the American dynamic publisher of a multitude of very popular technical and scientific magazines such as *Modern Electrics* (1908), *The Electrical Experimenter* (1912), *Radio News* (1919), *Science and Invention* (1920), *Practical Electrics* (1921), *Television* (1927), *Radio Craft* (1929), *Everyday Mechanics* (1930) and *Television News* (1931), *Amazing Stories* (1926), *Scientific Detective Monthly* (1930), *Air Wonder Stories* (1929), *Science Wonder Quarterly* (1929), *Superworld Comics* (1940) and *Science Fiction Plus* (1953), who claimed to have coined the term *Science Fiction* in 1929 in the editorial of one of his pulp magazines entitled *Science Wonder Stories*: «The Jules Verne, H.G. Wells and E.A, Poe type of story. A charming romance with scientific fact and prophetic vision.»[6] However, the first printed mention of ‹science fiction› came already in an 1851 essay called *A Little Earnest Book Upon a Great Old Subject* by William Wilson, but probably because it was not widespread like Gernsback's cheap pulps, Gernsback is considered the one who forged the literary subgenre. On the other hand, the word ‹design,› dates from two years earlier, and is by convention attributed to designer Sir Henry Cole, an official observer at Crystal Palace and the London Universal Exhibition of 1851, who in 1849, founded with Richard Redgrave, the *Journal of Design and Manufactures*. And it is not coincidental if within three years, the terms science fiction and design appeared, and for the first time, both in print.

Indeed, within the mass media sphere, design as well as science fiction were motivated by the very desire for an expansionist ‹crusade›. Central here was a shift of attention towards a culture of easily disposable, and momentary pleasures. Already, in the late 19th century, ephemerality became the norm and the periodicity of pulps and journals became the new reference point, thus spanning territories of validation on paper. They stealthily infiltrated the privacy of the home, the place where they are read, and through the process of dissemination, printed matter and ideas became one.

I need to quickly recount the emergence of design, for it is through the setting of its premises that the story can be set up within a frame of historical conditions that fully point to the complexity of a narration and help to escape the discipline's normative function, and maybe replace, instead, or in parallel, the notion of fiction.

As a term, design cannot be confused with design historical first narration which was Nikolaus Pevsner's *Pioneers of the Modern Movement*, in 1936, followed by Siegfried Giedion's *Mechanization Takes Command*, twelve years later, after WWII in the United States, in 1948. Both are generally considered the two original texts that tell a design history. Fiction, as both these texts set aside subjectivity and established the origins of an analytical reference system for design. In addition to constituting a starting point – for the fact that these publications are recent and that we can refer with certainty to the discipline's founding texts, begs the question of the possibility of a design history, given that these two ‹geneses› were written with two aims: Pevsner's project was to explain the origin of the Modern architectural movement and promote it in a context that was hardly inclined to discuss it, and Giedion's strategy was to found an ‹archaeology of technology›, as he coined it.

With such agenda placed outside of its disciplinary system, implemented by two modernist historians of architecture, design history presented a withdrawal from functionalism rooted in the recent capitalist society, and that movement led to the birth of design as a discipline that finds itself fictive if not fictional, even though design became caught within a dialectic of fiction versus function, and imaginary versus technology.

The conjoint problematic raised by design and science fiction was already introduced by Walter Benjamin's *Paris, Capital of the nineteenth Century* (1939), when he distinguishes two kinds of qualities, spatially embodied: «For the private person, living space becomes, for the first time, antithetical to the place of work. The former is constituted by the interior; the office is its complement. The private person who squares his accounts with reality in his office demands that the interior be maintained in his illusions… From this spring the phantasmagorias of the interior. For the private individual the private environment represents the universe. In it he gathers remote places and the past. His drawing room is a box in the world theater.»[7] The transformation of the private home, for Benjamin, was partitioned into two distinct spaces – the study, anchored in the real, and the living space, intentionally dedicated to dreams and artifices promising a world set aside. And such an opposition, even if Benjamin did not apply it precisely to science fiction and design, is an appropriate tool that plans a spatial intelligibility.

From the beginning, design was conceived, as was science fiction, in terms of a greed for the future. «My work is the embodiment of dreams in one form or another,»[8] wrote a young William Morris, the discipline's putative father, as Nikolas Pevsner asserted it in his seminal *Pioneers of the Modern Movement*. It was an idea he clung to, because in 1890, six years before his death, he also published *News from Nowhere or an epoch of the rest*, an utopian and uchronic science fiction novel, and an ideological criticism to Edward Bellamy's *Looking Backward* (1888). Doing so, Morris rejected the trap of the invention of design as a capitalist tool, that rationalizes, reconciles or harmonizes aesthetically its ambiguities and contradictions, and established the autonomy of design as the advent of the imagination and its ability to shape the real. This notion could apply to design as much as science fiction, the latter, a genre that the specialist on the question, Pierre Versins has described in his Hugo-Prized Encyclopedia on Science Fiction, as: «A universe bigger than the known universe […] It invents what could have been, what is without anyone knowing it, and what will or could be […] It is a warning and prediction, dark and enlightening […] It is the dream of another reality and realization of our wildest dreams.»[9] Morris is at the same crossroads of suggestions that is in favour of dreams and design. He struggles not to disassociate politics from socially engaged artistic creation and his *News from Nowhere* is the summit of his life philosophy where a system of coherent codes, fictional or not, cast as

6 *Quoted in Mark Siegel, Hugo Gernsback. Father of Modern Science Fiction, (San Bernadino, California: The Borgo Press, 1988), 39.*

7 *Walter Benjamin, «Paris: Capital of the Nineteenth Century.» Reflections: Essays, Aphorisms, Autobiographical Writings.» Edited by Peter Demetz. (New York: Harcourt, Brace Jovanovich, 1978. Rpt. Schocken, 1986.): 154.*

8 *Morris quoted by V. Dupont, «Introduction.» William Morris, Nouvelles de nulle part. (Paris: Aubier, 1957), 16.*

9 *Pierre Versins, Encyclopédie de l'Utopie, des Voyages extraordinaires et de la Science Fiction, (Lausanne: l'Âge d'homme, 1972)*

a social criticism of the industrialization and its nauseous outcomes. In great detail, Morris depicted a world full of wonder. He obsessively described the artifacts, as they determinate the relation between the system production, the environment and the individuals. His character, William Guest (note his last name) escapes from the technological determinism as he awakes one morning in an apparently ordinary house. As soon as he leaves his house, however, he discovers naively subtle changes and realizes that he is now part of a society regenerated by the combination of art and life in all things. With Morris, the coupling of design and science fiction is held together both by the two disciplines' shared visionary ambition and their need to combine fiction and a romantic reality, which he saw as the site of ethical struggle. These are ideas that Aldous Huxley also explored in a number of works, including «Notes on Decoration,»[10] in which he analyzed the shapes of modernity. Over and above the formalizations borrowed by Huxley's pamphlet or by Morris with his science-fiction novel, these ideas develop a critical analysis that was to supplant the consequences of an all-powerful blind belief in mechanization supported by next key modernist figures. Even if a new generation of technology was to be taken into account by the discipline, the historian Siegfried Giedion discussed these very consequences in *Space, Time, and Architecture*, and especially demonstrated their complexity in *Mechanization Takes Command: a Contribution to an Anonymous History*. Cautiously optimistic, in the preface, he believes, that comprehension can lead to a positive and renewed relationship to mechanization: «…At the origin of the inquiry stood the desire to understand the effects of mechanization upon the human being; to discern how far mechanization corresponds with and to what extent it contradicts the unalterable laws of human nature. The question of the limits of mechanization is bound to arise at any moment, as the human aspect, which is fundamental, cannot be disregarded.»[11] It is in this context, that the technical is increasingly vectored towards an aesthetic of the future of automatism, mobility, immateriality, miniaturization, air-conditioning and gizmos,… all of them hand-held. And even if with the pioneer such as Morris along the 19th century, science fiction acted as a vector for criticism of a technological utopia by turning its own impulses against itself to reveal its true horror, the extreme conscience craved by science fiction moves from technophilia to technophobia without suffering as a result and unfolds as much in the values of modernity as in their liquidation. From this premise, technology claims to be at the service of humanity, but it remains so in appearance only, and actually it subjugates it. The relationship between design and science fiction sits on the edge of this tension orchestrated by the technological. It's not by chance that Bruce Sterling, the author of *Shaping Things*[12] (his major contribution essay about design) and ‹visionary designer,› as he called himself while giving a design class at Pasadena University a few years ago, has termed this: ‹techn-obese›. In *Schismatrix* (1985), his most famous novel, in which the hero Abelard Lindsay works for an alliance between the technological mutations of the ‹Mechanists› and the organic, biological ‹Shapers› to his pamphlet: *Viridian Green*[13], Sterling cultivates a cyber-modernity in which technology and anthropo-technology constitute and reconfigure the environment and the human body, but cannot conceal any longer the violence of the modern technology they face.

## «I've seen the future»

Take the example of the 1939 World's Fair in New York. As war raged in Europe, the city of New York opened its World's Fair with the theme of ‹Building the World of Tomorrow.› The Fair was a celebration of American modernity, epitomized by the idea of ‹streamlining,› the design movement based around the laws of aerodynamics and hydrodynamics. Beside the first-ever talking robot, shops of industrial packaging and model shops, was a program of tomorrow's urbanism and politics, including designer Henry Dreyfuss' exhibits, ‹Perisphere› and ‹Democracity,› as well as Norman Bel Geddes' ‹Futurama,› a technology-loving vision of tomorrow's world. Bel Geddes, invited to the Fair by General Motors, conceived an imaginary landscape at the heart of a building sponsored by the motor company. A large majority of the seventy thousand daily visitors to the Fair rushed to see his panorama. After a long time waiting on a two ramps, they were taken in pairs and placed in headphone-equipped seats, lined up in a row. Moved along by a conveyor belt, the seats slowly passed through the diorama's two levels giving visitors a completely novel vision – one of the future. They were given viewpoints, perspectives and low-angle shots of this landscape, which contained highways along which fifty thousand miniature cars drove, skyscrapers that defied gravity, as well as factories, milk-plants and scientific farms. For sixteen minutes visitors were treated to fatigue-free tourism[14]. Every hour, two thousand visitors,[15] comfortably seated in the air-conditioned décor, were placed perpendicular to the landscape and admired five thousand square meters of the future, while a pre-recorded commentary explained to each of the wonders «that might see the day in the not-so-distant future» as seen by General Motors. They were extracted from the present so they could live in a future world normalized by the insolent fluidity of congestion-free roads and the speed of total streamlining: from the milk lorries to the skyscrapers, cars to model farms, an expanse of model buildings constructed with the aesthetic of speed passed them by. The whole thing pushing in the direction of the unknown associated with happiness, democracy and progress. It's not surprising, perhaps, given ‹Futurama's› spectacular and technological nature, that it became the model for those imagining the future and a complete introduction to science fiction through design. «Visitors were offered a full-scale trip to the crossroads of a veritable ‹tomorrow's metropolis,› with prototypes of futuristic cars (and access to a car showroom), a typical apartment, a theatre, as well as a department store in which visitors could buy souvenir items – almost like tangible proof of their journey through time. If the first part of Futurama was comparable to a sort of 3D cinematic experience, the final section must have given visitors the feeling

10 *Aldous Huxley, «Notes on Decoration.» Creative Art, 7 (Oct., 1930): 240.*

11 *Siegfried Giedion, Space, Time, and Architecture, (Cambridge, Harvard: University Press, 1941), 9.*

12 *For more, see Bruce Sterling, Shaping Things, (Cambridge, Mass., London, England: MIT Press, 2005)*

13 *Bruce Sterling, Viridian Green Manifestoe, posted on his blog on January 3rd, 2000.*

14 *Donald J. Bush described it thorougly in The Streamlined Decade, (New York: George Braziller, 1975).*

15 *Olivier Lugon, «Des Cheminements de pensée ; la gestion de la circulation dans les expositions didactiques.» Oublier L'exposition. (Art Press, n° 21, 2000): 21*

of having effectively adventured into the heart of a science-fiction film, of having penetrated inside a cinematographic vision of the future.»[16]
The dialogue between the present and the future, whether in cinema or design – the projection of a temporal continuum, in which prediction constitutes an arrangement of modernity – makes sense for streamlining, the first movement in American design. Bel Geddes' visionary project embodies this aspiration, as seen in Harold Van Doren's enthusiasm for it. «The real populariser of the streamline idea was a genius of the theatre,» wrote the pioneering industrial designer «who put his talent and enthusiasm into the visualization of a world of the future [...] It was in the air. What Geddes did was to dramatize it, well before it had really arrived, and so convincingly as to crystallize the scattered forces already tending in that direction, and bring reality to a tendency which up to then had consisted of theory and tentative experiment».[17]
«...The strength of Futurama comes from its realization of these imaginary ideas in popular and intelligible forms. It also results from its capacity to stage the space in which these objects sit. Doren was interested in what Bel Geddes had been able to conceive in advance (by bringing together various bodies in a single trajectory) as the world to come. There was a reason that the badge given to each visitor to Futurama read, «I've seen the future» – Bel Geddes and his contemporaries, too.
If we take seriously the potential of Harold Van Doren's statement, that the streamliners, who happen to be the first modern designers, transformed ‹imaginary ideas› into ‹popular and intelligible forms›, design is not captured anymore within the previous dialectic system. But if we can provisionally assert that the intersection of design and science fiction function as a force of vulgarization, that it gives them a socially powerful status, meanwhile the role of a translator subjects them to a limited role, to a mere instrument. Returning to Gernsback whose untiring entrepreneurial spirit led him from the creation of the Electro Importing Company which imported electrical equipment from Europe to sell to handymen, experimenters and American inventors in 1905 to *Forecast*, a booklet sent annually around Christmas from 1934 until the mid-1960's, in which he depicted his own scientific inventions. No fiction, only scheme, facts, and process descriptions, ranging from a ‹dream-recorder,›[18] translating night dreams on screen to a ‹Lunar-o-mobile,› an encapsulated cycling device that would allow explorers to travel on the Moon, no main discrepancy seems to reside between design, technology and storytelling. Gernsback always rejected whatever was not scientifically correct or plausible.

## Artifice

But beyond Gernsback's initial rhetoric of functionality so effective to characterize science fiction, as it does for design, what remains as the main stake for the two subdisciplines is that in rendering visible their agenda, it gives rise to new forms as it unveils their ability to forge a space for a new act. Submitted as the definition presented by the philosopher Vilém Flusser, the new act was introduced by its uncommon definition of design in its etymological relation to artifice: «The Latin equivalent of the Greek *techne* is *ars*, which in fact suggests a metaphor similar to the English rogue's ‹sleight of hand›. The diminutive of *ars* is *articulum* – i.e. little art – and indicates that something is turned around the hand (as in the French *tour de main*). Hence *ars* means something like ‹agility› or the ‹ability to turn something to one's advantage,› and *artifex* – i.e. ‹artist› – means a ‹trickster› above all.»[19] Reflecting on the etymology of the word ‹design›, Flusser points out that it «occurs in contexts associated with cunning and deceit. [...] Falling into the same category are other very significant words: in particular, mechanics and machine. [...] Consequently, a machine is a device designed to deceive; a lever, for example, cheats gravity, and ‹mechanics› is the trick of fooling heavy bodies.»[20] can be placed at the intersection of three traditions brought forth by modernity and long considered discrete: mass media, science fiction and design. Further than to rival the functionality advocated by industrial design, and veering towards superpower and abstract possibilities, by virtue of their fictionalising power, these devices which culminate in narrativity, divert the ordinary function of these seemingly everyday objects, undermining any attempt to rationalize design and consecrate the uses to which objects should be put. It is hardly a coincidence, then, that after the strategy of a mass media invasion, the dialectics of fiction vs. function, intertwined with the notion of artifice as the next development deployed both by design and science fiction to operate inside and outside the technological realm of technological capitalism.
I claimed previously in: «Tomorrow Now: When Design Meets Science Fiction» that for science fiction, the figures of the Trojan Horse set up by Flusser was an effective archetype of camouflage which forces the evidence presented to be moved towards a weaving of ambivalent, metaphorical and deliberately complex content, and it did so from the origin of design and science fiction. Because of the ambivalent relationship that technology's intrusion imposes on individuals and on society, this clash between design, science fiction, technology and fiction occurs not only for domination in the pre-industrial context from which the two disciplines have emerged, but also from the popular dimension of the fictional story conveyed by magazines, as well as in our post-industrial utopian system. Fiction has accessibility which enables the principle of the Trojan Horse to operate more effectively; its popularity enables the vulgarization and the so-called democratization necessary for the infiltration, situating the function as a symptom of the enchanted early moment of the modernity and its abandonment or disavowal, as its opposite disenchantment.

## The future in bad shape

This vision of the future imagined autonomous devices: flying saucers, interstellar voyages, the colonization of far-flung planets, journeys at the speed of light, invisibility and cities of light, because this was a time when the shining, chromed, hygienic, hi-tech future (the future of humanity, in other words)

16 *Jay P. Telotte, « I Have Seen the Future. The New York World's Fair as Science.» Tomorrow Now: When Design Meets Science Fiction, exhibition catalogue edited by Alexandra Midal, (Luxembourg: Mudam, 2007), 47-58.*

17 *Harold van Doren, Industrial Design: A Practical Guide, (New York: McGraw-Hill, 1940), 152.*

18 *Hugo Gernsbak, Forecast. (1953): 19-21.*

19 *See Vilém Flusser, «About the Word Design.» The Shape of Things: A Philosophy of Design. (London: Reaktion Books, 1999), 18.*

20 *Ibid.: 17.*

made people dream. It was the time of Gernsback and Bel Geddes, men who imagined the future as an Eden inhabited by cultivated young people, who, pacified by knowledge, moved around in their flying cars from one glittering skyscraper to another. It was also, however, a time when films such as the Fox musical *Just Imagine*[21] or H.G. Wells' *Things to Come*[22] were released, anguished portraits of a world devoid of humanity. The crisis in the modernist movement did not, however, sound the death knell of the idea of the future. It was not so much the future that was damaged but rather its link to progress and technology. The future survived the advent of post-modernism, as show Charles Jenck's ‹Evolutionary Tree,› his six structuralist hypotheses for tomorrow first published in his 1969 (again in 2000) *Architecture 2000*. In a certain way, the future – anchored in the modernist utopia and contrary to the available evidence – survived, but, if we are to believe Ballard's claim, only as a vision of its spirit. «Did the future arrive too early, somewhere around the middle of the century at the peak of modern science fiction? […] Apparently we have turned our back on the future so we can nostalgically contemplate a reinvented past that we didn't ever manage to appreciate the first time. […] It might be that we have already dreamed our dream of the future and that we will be awoken with a start in a world of motorways, shopping malls and air stations stretching around us like the first episode of a future that had forgotten to materialize.»[23] Today, how can the future actually make us dream? «Does the future still have a future?»[24]

During the 20th century, design and science fiction came together on a number of occasions. The first time is linked to the anticipation and innovation of Gernsback and the 1939 World's Fair, of which the *Futurama* is incontestably the most surprising and premonitory example. Science fiction and design tried to allow the idea of technology in the service of humanity to be accepted. The second link-up took on impressive proportions in the post-WWII dream of the conquest of space. Captivated by the eventual discovery of new intergalactic territories and counterbalanced by the importance accorded to interior worlds, designers took inspiration from the imaginary and the shapes of science fiction, through the fiction that,once hijacked, validated – or denounced – the technological. Finally, next to research based on the idea of time as a linear movement, a third way was proposed based upon a vertical axis of time. This challenge to Cartesian logic was created out of the premise – so dear to the avant-garde – of a fourth dimension: one of time in which parallel worlds sat on the other side of wormholes, teleportation doors and other breaks in the space-time continuum, which were then juxtaposed with the reality of the present moment. In 1977, the science-fiction writer Philip K. Dick humorously and hopefully summed up the central idea of his work in a lecture entitled, «If You Find This World Bad, You Should See Some of the Others.»[25] A decade or so later, William Gibson begins his short story ‹The Gernsback Continuum,› with a photographer being commissioned to undertake a reportage on streamlining. «And as I moved among these secret ruins, I found myself wondering what the inhabitants of that lost future would think of the world I lived in. The Thirties dreamed white marble and slipstream chrome, immortal crystal and burnished bronze, but the rockets on the covers of the Gernsback pulps had fallen on London in the dead of the night, screaming. After the war, everyone had a car, no wings for it and promised superhighway to drive it down, so that the sky itself darkened, and the fumes ate the marble and pitted the miracle crystal…»[26] Tracked by the apparition of chrome objects and aerodynamic shapes, fragments of streamlining intermittently attack his conscience. Design is the dramatic impulse for the story's action, far more than its protagonists. These breaks give the reader a glimpse of a possible tomorrow that escapes the single contingency of temporal flux. With parallel worlds, the simultaneity of different realities meet and the notion of a possible future is little by little erased. From now on, and with each allusion, the idea of the future is marked by its own end. This hypothesis of a future stigmatized by technology's reign of modernity and optimism disappeared with the 1930s, even if it has never ceased to pretend to be valid. I more imagine it obsolete and bloodless, proudly wearing its expiry date, and tidied away in the drawers of the past, now just part of a classification system. Rather for instance Reyner Banham reported in his 1966 ‹All That Glitters is not Stainless,› that it was already in operation: «Too many of the great unquestioned assumptions on which modern design is based have begun to peel and fade of late; neither they nor their advocates appear to be quite such stainless representatives of the shining new world as once we thought. It is high time we checked to see which ones have rusted through and must be junked, which need to go back in the plating tank, and which only need a wipe over with the silvercloth.»[27] It has become apparent that the predictions and all other experimental futurological practices were atavistically implanted in the modernist movement promises. But as modernism has not delivered on its expectations, the future still in a paradoxical situation, monolithic, it floats somehow in the waiting room of the demised modernism, and partly «wiped over with the silvercloth,» to paraphrase Banham, it attempts to be replaced in varying degrees of success and visibility, and performs a new trajectory.

## Another borderline

While immersed in a determination of a boundless territory of ramifications and a re-territorialization of the disciplinary boundaries, here I would like to turn from this expansionist impulse and no matter how far from it we can be today, this text is a call to order a radical recasting of the discipline of design. In a design embroiled in an all-pervasive post-technological culture, in a functionalist mythology of design cemented by modernism, towards social and

21 *As far as I know it is the first sci-fi musical film (1930).*

22 *H. G. Wells, The Shape of Things to Come, 1933. In 1936, the film was directed by William Cameron Menzies.*

23 *Ballard, «Retour au Futur. A propos de l' Encyclopédie de la science-fiction.» edited by John Clute and Peter Nicholls in The Daily Telegraph, 17 April 1993 and republished in Millénaire mode d'emploi, op. cit.*

24 *Ibid.*

25 *Philip K. Dick, «If You Find This World Bad, You Should See Some of the Others» (1977). Speech given at the occasion of the 2nd International Festival of Science Fiction. Metz, September, 24. 1977.*

26 *William Gibson, «Le Continuum Gersback.» Mozart en verres miroirs. (Paris: Gallimard, 2001), 31*

27 *Reyner Banham, «All That Glitters is not Stainless » (1966), lecture given at the Aspen Design Symposium, and published in The Aspen Papers Twenty Years of Design Theory from the International Design Conference in Aspen, edited by Reyner Banham, (Londres: Pall Mall Press, 1974), 155-160.*

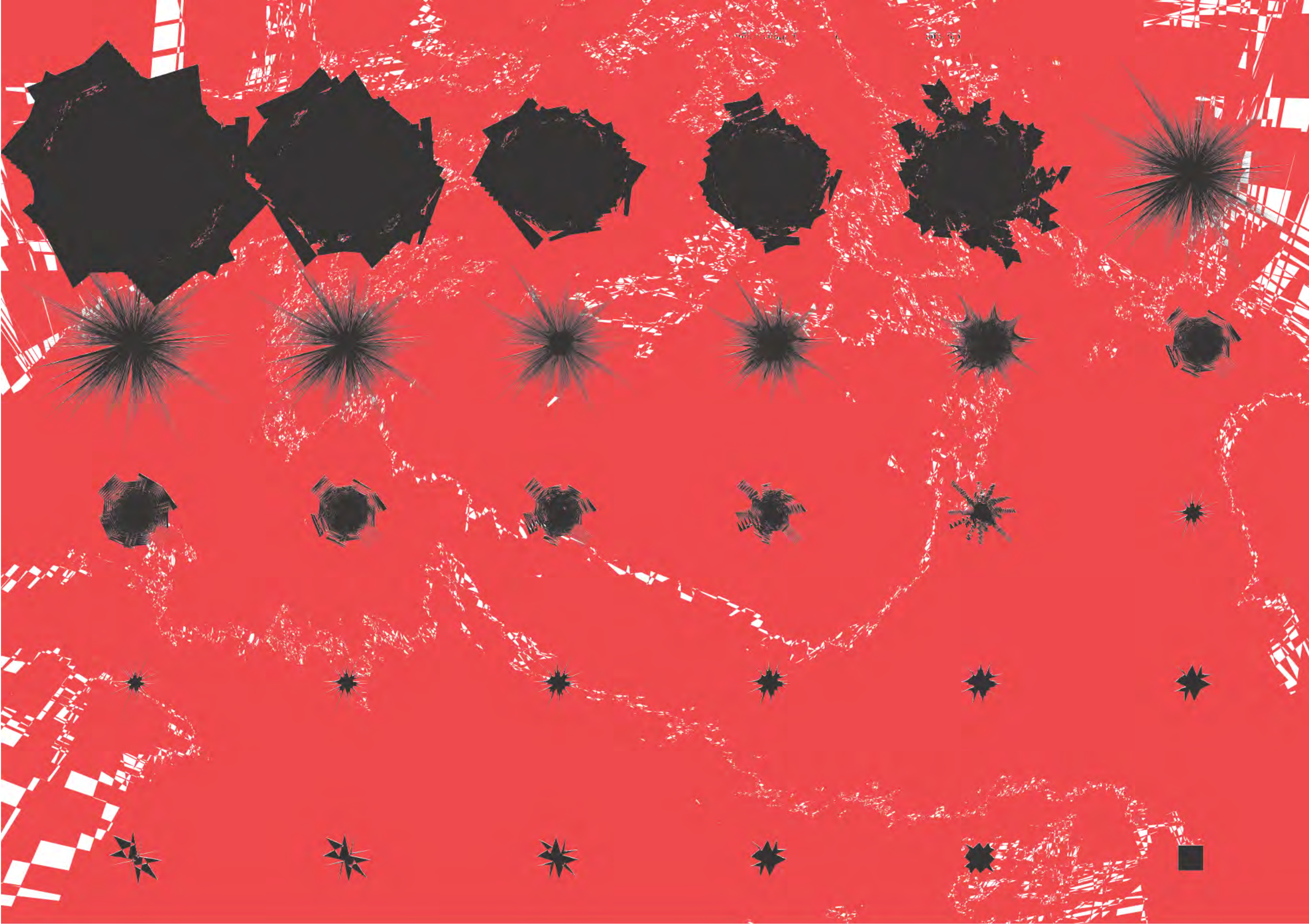
ecological progressive ameliorations, in contrast to these many unquestioned narratives, far from visible and never integrated to the mainstream history, lies the remarkable notion of artifice. Important lesson for design, this latter does not replace the ruins of progress or recolonize them, but considers a new critical negociation of the design lineage. For it is precisely this interrelation that, I believe, opens up a new mode of spacing through which the discipline comes to redesign itself.

Therefore, if on the surface, the notions of artifice and storytelling seem unrelated to design, they are the accomplices enabled to reveal the contours of the discipline. Allow me therefore to once more turn to Flusser who adds that «[t]he new form of culture which design was to make possible would be a culture that was aware of the fact that it was deceptive. So the question is: who and what are we deceiving when we become involved with culture (with art, with technology – in short, with design)?»[28] When seen from a perspective that discards its functionalist premise, design becomes a mediation between individuals in specific contexts and thus comes to expose the myth of its own origins. When the first chapter in a new history of design gets written the most appropriate manifestation of its tendencies will be found in a world of fictional speculations. Science fiction encourages us to render design again recognizable because of the relations between discourse and forms it harbors and legates, therefore the aim now is to reiterate the meaning of ‹giving form to something› which is etymologically related to fiction, but it is an other story.

*Alexandra Midal*

Alexandra Midal is a design historian, graduated from La Sorbonne and from the School of Architecture of Princeton University. Rome Prize recipient, former Director of the Regional Founds of Contemporary Art of Haute-Normandie (FRAC), former assistant of Dan Graham, Alexandra Midal combines activity in research in design theory, as free-lance curator and Professor / co-Director of the Master in Space & Communication at the HEAD-Geneva.

28 *Flusser, op. cit.: 19.*



# **Design Fiction** *by Simon Grand*

The particular characteristics, qualities, approaches and methodologies of design and design research are the focus of constant debates: some argue that one should map the multiple perspectives and approaches of self-declared design and design research; some take a perspective, set to practice and justify their activities in the light of their personal approach; some enter an epistemological and methodological reflection on the appropriate concepts and definitions of design research. We follow another avenue: instead of defining and conceptualizing design and design research in terms of what it is, we focus on how we can *re-invent possible futures through design and design research, as well as how this enacts and shapes possible futures for design and design research, in terms of what it could be, especially today; this is what we call ‹Design Fiction›.*

Such an approach to design and design research is promising, because it explicitly discusses affirmative and subversive approaches to design, design research and research; it is at the same time critical and imaginative, relating to recent debates in the so-called science and technology studies, emphasizing the fictional and constructive qualities of scientific research, in its close and complex interplay with technological innovation and societal development; it thereby *enters the controversial field between the cultural and the commercial, the scientific and the artistic, the economic and the political*, branding and no logo, and thus enlarges and enriches our perspectives on possible futures of design and design research. In particular, we address the following fundamental questions:

— Which *strategies, methodologies, approaches* for design and design research are particularly promising and productive, if the creation, establishment, invention and transformation of possible futures and alternative worldviews is seen as important for design and design research?

— How does design and design research materialize these possible futures and alternative worldviews, as *artifacts and products, processes and services, technologies and interactions, companies and collectives*, which embody, represent, communicate and change possible futures?
— How is a detailed description and analysis of creation, establishment, invention and transformation of possible futures and alternative worldviews best addressed in terms of *promising terminologies, new conceptualizations, theoretical perspectives and philosophical approaches*?
— How and why does design fiction as an approach to design and design research relate and refer to related (and partially overlapping) fields of activity, including *technological innovation, scientific research, political engagement, artistic practices, entrepreneurial initiatives*?

The keynote speakers of the 2nd day, James Auger, Julian Bleecker and Franz Liebl introduce different approaches to how the world as it is, can and must be challenged, questioned, subverted, hacked and transcended, and how alternative, new, unconventional, inspiring futures can be created, enacted and established through the theory and practice of art and design, as well as artistic and design research, in close collaboration with other fields, including technology, science, business, art. Thereby, they develop their perspectives and approaches in the complex, heterogeneous, controversial web of relations between design and fiction, art and research, branding and hacking, innovation and subversion, technology and society, commercial success and cultural relevance.
James Auger, a product designer, design researcher (Royal College of Art, London) and partner of the speculative design practice Auger-Loizeau (www.auger-loizeau.com) talks about ‹Domesticating Technology›, extrapolating emerging technologies to explore, design and challenge possible futures. In the tradition of *Critical Design*, he explores emerging technologies in their complex, chaotic, unkempt and unpredictable nature. He argues: «The journey from the lab to the home is long, arduous and uncertain but ultimately the successful technologies will become the products that define our future selves. By accepting this lineage design fictions can do two things: *Project current emerging technological development into the products of tomorrow; and imagine alternative histories to speculate on alternative presents.*»
Julian Bleecker is a designer, technologist and researcher at the Design Strategic Projects studio at Nokia Design in Los Angeles and the Near Future Laboratory (www.nearfuturelaboratory.com), and a prominent voice in the *Design Fiction* discourse. He talks about «Design Fiction: From Props to Prototypes and Back Again», moving beyond the routine, everyday notion of what design does and even what it is. He argues: «Design seasoned with the impulses and motivations of fiction offers the possibility that design can speculate, and do so in an articulate, writerly way. *Design fiction brings the craft together with fiction's way of thinking through to the unexpected, unconventional, undisciplined and unheard-of, moving on a continuum of design activities that stretch from props to prototypes and back again.* Design Fiction relates its narratives to science fiction and to the science and technology studies (STS).»
Franz Liebl, professor of strategic marketing (Berlin University of the Arts), talks about ‹The Strategic Value of Art›, and what strategic management can learn from leadership hacking, based on the discussion of a fascinating *Critical Company*, Yann Toma's ‹Ouest-Lumière›. Starting from studies on *Cultural*

*Hacking*, with its interest in investigating subversive strategies of innovation in art and design, strategy-making and business-model development processes in an artistic context are described, as a source of insights, inspirations and innovations, but also of subversions, critiques and controversies with respect to our understanding of strategic management, in the art and in the business world. Liebl says: «*if art is to provide a major contribution for business firms, it has to address the level of strategic management. Thus the focus of interest is the ‹strategic value› of art.*»
These three perspectives are at the same time highly autonomous und unique in their approach, but also embedded in a broader movement in contemporary design practice and design research, which can be called ‹Design Fiction›, and which operates ‹in between› the existing and the new, the known and the unknown, the self-evident and the unconventional, the real and the possible, the present and the future, the fictional and the factional, in art, design, business, science and technology; in our view a very promising perspective for the future of design and design research.

*Simon Grand, economist and entrepreneur, strategy and design researcher and host speaker, simon.grand@fhnw.ch*

James Auger Royal College of Art in London, UK, info@augerment.com

# Alternative Presents and Speculative Futures *Designing fictions through the extrapolation and evasion of product lineages.*

Keywords: Speculative design, critical design, aesthetics, evolution of technology, design futures

The products of tomorrow will be shaped and controlled by the emerging technologies of today. In their current state these technologies can be complex, chaotic, unkempt and unpredictable. Comfortable in the hands of the scientists and engineers responsible for their development but wholly unready and inappropriate for domestic application. The journey of a technology from the laboratory to the home is long and arduous but ultimately happens in quite predictable ways. The majority of products have a lineage that goes back through countless generations, each one a small iteration of the previous. By accepting this lineage, design fictions can do two things:

1. Project current emerging technological development to create Speculative Futures: Hypothetical products of tomorrow.

2. Break free of the lineage to speculate on Alternative Presents.

These fictions effectively act as cultural litmus paper, either offering tasters of how it might be to live with the technology in question or challenging contemporary applications of technology through demonstrable alternatives.
This presentation will focus on how these two types of fiction are created, how they differ from science fiction, other modes of future thinking and technological critique. More specifically how both methodologies utilise designed artefacts. What informs the development, aesthetics, behaviour, interactions and function of these objects? Once created, how and where do they operate? How can we gauge and understand their impact and meaning?

«All inventions and innovations, by definition, represent an advance in the art beyond existing base lines. Yet, most advances, particularly in retrospect, appear essentially incremental, evolutionary. If nature makes no sudden leaps, neither it would appear does technology.»[1]
Just as technology advances in small iterations, so do the products that contain it and present its public face. It is extremely unusual for revolutionary, conceptually original products to enter the market successfully[2] Many of the concepts behind contemporary products have a lineage that can be traced back to the beginnings of the last century and beyond. Initially these objects provided clear improvements to the human condition and therefore their value was obvious and their introduction unquestioned.[3] Now, many generations later we find ourselves very far from where we started but as a consequence of the incremental nature of this progress, it has mostly gone unnoticed. To employ a simple culinary analogy: We are like lobsters long since plunged into a pot of cold water and slowly but surely the temperature is rising as we begin to boil in our own juices. This metaphor is perhaps over dramatic and erring towards the negative but it does fairly describe our relative unawareness of the technological journey we have found ourselves on. There are still few discernible methods for questioning this journey outside of the traditional philosophical routes[4] and whilst these are undoubtedly valuable their activity rarely breaks through the walls of academia.
Speculative design and the fictions born of it is one attempt to facilitate a more democratic and accessible method through which to explore and question technology and its application in our everyday lives. This application and

1 Heilbroner, Robert: Do Machines Make History, Essay in Kaplan 2004

2 There is some debate about the truth of this statement; for some inventions come through the labour of individual geniuses such as Edison and Ford. For a convincing argument for this case see: Basalla1988.

3 There are exceptions such as in the Amish community, see Kraybill, 1999.

4 Philosophy of technology as practiced by the likes of Heidegger, McLuhan, Ellul etc.

the research behind it have become so entwined with market forces, shareholders, efficiency and political issues that the original values, motivations and meaning of its progress have become obscured. The primary function of many modern products is to make profit, and whilst there is obviously a relationship between its potential to do that and the quality of the artefact, more complex influential factors have come into the equation such as brand worship, status symbols and the role of fashion. The modern designer sits somewhere in the middle of these factors, juggling with micro-trends, brand identity, rapid increments in technological capabilities and the fundamental need to play to market forces.[5] This is design fact.

Design fiction can remove these commercial and real-world constraints to re-imagine our technological developments as free[6] from shareholders, brands, politicians and the well-trodden conservative paths that have brought us to where we are today. It can be a space for dreaming, challenging and awareness raising:

Existing paradigms can inform design fictions: ‹Speculative Futures› imagine, through the extrapolation of contemporary systems, near future products and services. These are intended to act as a form of cultural litmus paper, testing potential products and services before they exist.

‹Alternative Presents› are design proposals that utilise contemporary technology but apply different ideologies or configurations to those currently directing product development. Here we break free of lineages to question why things are the way they are.

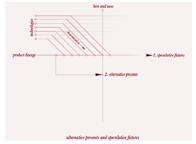


*Figure 1*→**II**
*Alternative presents and speculative futures.*

At the origin is the here and now; everyday life and the real products that are available on the high street. The lineage of these products can be traced back in time to where the technology became available to iterate them beyond their current form. The technology element on the left hand side represents research and development work, the higher the line the more emergent the technology and the longer and less predictable its route to everyday life (domestication). As we move to the right of the diagram and into the future we see that speculative designs exist as a projection of the lineage, they are developed using a methodology that focuses on contemporary public understanding and desires and extrapolates these through the imagined appliance of an emerging technology. Alternative presents step out of the lineage at some poignant time in the past to re-imagine our technological present. These designs challenge and question the existing systems and objects that arise from current modes of manufacture.

## Speculative Futures and Alternative Presents: A design methodology.

How do we design compelling and believable fictions and what differentiates these from other disciplines such as science fiction, technology fairs and concept exhibitions? Here I will list a few of the key methods, observations and tools used in the design process, exemplified by personal case studies[7]. Firstly though it is necessary to briefly mention the semantic issues surrounding this space. Foremost it is a design discipline; this has been challenged by some who would argue that design, by necessity, should focus on solving problems and bringing products to market. To this we counter that design must also be reflective and capable of questioning itself and its role in shaping the products that mediate our lives.

More importantly the design label is tactical, here Tony Dunne describes a critical design methodology but the point remains the same:

«Critical Design needs to be closer to the everyday, that's where its power to disturb comes from. Too weird and it will be dismissed as art, too normal and it will be effortlessly assimilated. If it is regarded as art it is easier to deal with, but if it remains as design it is more disturbing, it suggests that the everyday as we know it could be different, that things could change.»[8]

Secondly, we use the qualifiers (critical, speculative, fictions) carefully and dependant upon the audience to whom we are presenting. By labelling a designed object or service ‹a fiction› or ‹a speculation› renders it impotent, not real and therefore less threatening or engaging. The object that *could* be owned has far more power to challenge, upset and invoke poignant reaction.

### How to design the speculation: The ecological approach.

«I think everyone expected to see a man emerge……. But looking, I presently saw something stirring within the shadow: greyish billowy movements, one above another, and then two luminous discs – like eyes……. A big greyish rounded hulk, the size, perhaps, of a bear, was rising slowly and painfully out of the cylinder……. The incessant quivering of the mouth, the gorgon groups of tentacles, the tumultuous breathing of the lungs in a strange atmosphere, the evident heaviness and painfulness of movement due to the greater gravitational energy on earth…… Suddenly the monster vanished. It had toppled over the brim of the cylinder and fallen into the pit, with a thud like the fall of a great mass of leather.»[9]

*Figure 2*→**II**
*Spielberg's alien*



«I tried a bunch of different heads, but Steven Spielberg wanted to pay tribute to the shape of the spaceship in the original movie,» Sims said. «No matter what I did with that head, we always went back to this shape. For the eyes, Spielberg kept saying they should be overly dilated, refracting with light almost like you'd see in a cat.

Spielberg wanted one leg in the back and two in the front. At Stan Winston's we did an animation of the alien crawling on the ceiling, showing how his legs would function as arms as well and pick stuff up while using the other leg to balance.»[10]

5 *There are obvious exceptions, but here we talk predominantly about designers in the employ of large companies responsible for producing the majority of available contemporary products.*

6 *Of course design fictions can also exist within the commercial context but here there is by necessity a positive spin on the technology, changing the fundamental motivation and therefore the freedom of practice.*

7 *The projects here (with the exception of Happylife) have been produced in collaboration with Jimmy Loizeau under the name Auger-Loizeau.*

8 *From the website: http://www.dunneandraby.co.uk/*

9 *Wells, H.G, 2004.*

10 *From the Wired interview with Aaron Sims: http://www.wired.com/underwire/2008/12/monster-man-beh/*

Here we have two descriptions of the Martians from ‹The War of the Worlds.› The first from the original novel by H.G.Wells (1898) and the second from Steven Spielberg's film version (2005). If we take the Martian as a speculative object we can compare the two approaches to its design. The question I pose here is not which interpretation is the most compelling, engaging, terrifying or memorable but which is the most probable or relevant to those genuinely interested in knowing what Aliens might look like. The celluloid version has a certain familiarity, resembling many other filmic depictions of disconcerting aliens in recent years. It displays its physical superiority to humans with a cat-like deftness as it employs it's several arms to move three-dimensionally around the room. It is without question captivating and terrifying and therefore perfect as a form of entertainment, which perhaps was the primary factor in its design. Wells' Martian on the other hand is clearly suffering, ungainly, awkward and struggling to cope with Earth's gravity. Wells trained as a biologist[11] so would have a good knowledge of the concept of adaptation.[12] Although we have no proof, logic suggests that Martians would be mal-adapted to life on Earth and his depiction applies this theory to inform the design of the Martian. This could be described as an ecological approach to designing fictions and is an extremely useful tactic when looking where and how to inform the design process. To gain a broader insight it is helpful to refer back to natural ecology itself:

*«[W]hen an ecologist says ‹there goes a badger›, he should include in his thoughts some definite idea of the animal's place in the community to which it belongs, just as if he had said, ‹there goes the vicar›.»*[13]

This approach seems simplistic and obvious but on closer examination serves to eloquently explain the complexity and importance of context when thinking about the existence of (real) things. To truly understand something it is imperative to consider not just the object in isolation (vicar) but also who and what it interacts with (congregation, religious artefacts), the physical environment (church, cemetery), the politics and systems that make up the society (religion/culture) and how all these factors relate and interact with each other (moral order). This understanding of the ecology of things can also be applied to objects in the domestic environment: Any design project starts with generating an understanding of the variables involved. For example, if a client asks a designer to develop a coffee machine, they probably start with the fundamental question: Whom are we designing for? Are they more influenced by the quality of the coffee; the efficiency of the system; the form of the product; the cost? What technology should be incorporated: Coffee grinder? Coffee pods? Milk steamer? What are the current trends in coffee machines? What manufacturing processes do we have at our disposal? And so on. Only when we truly understand the customer and the context in which they exist can we begin to design for them.

Many speculations or visions of the future fail to resonate due to the simple fact that they are conceived without real consideration for who would use them or where they would be used. They project too far, exhibiting far-fetched capabilities, or like Spielberg's Martian, adopt stereotypical futuristic aesthetics that make them entertaining, tantalising and impressive but too far removed from contemporary life to threaten. If we design speculations with the same basic methodology as any design project, specifically focusing on a target audience and where and how that audience exists then the results have a much stronger chance of personally resonating with them.

## From technology to product: Domestication

If the ecological approach can inform the landscape of where the speculative object is to exist, then the concept of domestication can inform how to get there. No object is born into the domestic domain; it is through a long and arduous journey that a technology may find a place in our lives. One insightful example of successful domestication is the wolf. Over an approximate 12000 year period the wolf has gone from existing in a natural ecosystem complete with predators, prey, hierarchy conflicts and food chains to the domestic ecosystem with few predators, no food worries, warm shelter and most importantly a complex symbiotic relationship with man.

*Figure 3* →II
*biotic to domestic*



Over many years of selective breeding the wolf lost its wilder tendencies, developed puppy like aesthetics and learned to satisfy the complex and ever changing needs, values and desires of man: «If you could read the genome of the dog like a book, you would learn a great deal about who we are and what makes us tick.»[14]

Emerging technologies could be compared to the wolf, offering glimpses of potential usefulness but raw, slightly wild and complex. Comfortable in the lab environment (their natural habitat), operated by scientists, engineers and other experts in the field, they need to go through a period of domestication before they are suitable for application in the home.

*Figure 4* →II
*EDSAC, Cambridge 1949*

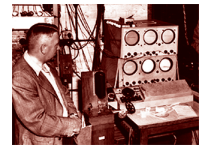


*Figure 5* →II
*Apple iMac 2007*



By researching emerging technologies,[15] and of course having a good idea of «what makes us tick,» the designer can speculate on the types of products that could arise through the domestication of that technology. Imperative here is to acknowledge the complexity of people; their desires, nuances, fears and aspirations. In this way the speculative artefacts and the fictions they carry become more tangible, compelling and relevant.

11 *Wells had a 1st class honours degree in Biology from the Normal School of Science in London.*

12 *The Oxford Dictionary of Science defines adaptation as «Any change in the structure or functioning of an organism that makes it better suited to its environment»*

13 *Elton, Charles: Animal Ecology, Sidwick and Jackson Ltd, 1927*

14 *Pollan, 2001. p. xv*

15 *This often involves collaborating with scientists: see Happylife, p. 11*

## Case Study: Function – Audio Tooth Implant

When we are exposed to future concepts it is with our contemporary sensibilities that we judge them. Applying the lineage theory described in fig. 1 we can closely analyse recent iterations in specific products and project these into the near future. This is effectively applying new technological developments to contemporary trends and fashions. These fictions more resemble design facts: real proposals that can induce the product consuming audience into genuinely believing that the concept is real.

This approach was employed in our project, Audio Tooth Implant (2001):



*Figure 6*→**II**
*Audio tooth implant (Auger-Loizeau, 2001)*

The primary aim of the project was to question implantable technology for human enhancement. The concept relies on a combination of general public awareness of hard and well-publicised facts such as the miniaturisation of digital technology, urban myths such as dental fillings acting as radio antenna and picking up audio signals and the rising popularity of mobile communication technology. Also necessary to convince is a description in layman's terms of the technology involved. With the tooth implant we were assisted in this by approaching research scientists at a large telecommunications company who offered the following:

«The moisture in the cheeks effectively make the inside of the mouth a faraday cage: a radio free space. Therefore the chip would have to receive low-frequency radio in the order of 150kHz. This signal would energize the dormant chip implanted in the tooth through near field magnetic effects. A transducer transforms this sound information into micro vibrations which through the process of bone transduction are transmitted along the jawbone and directly into the cochlea where they are experienced by the wearer as normal sound.»

We consciously chose the tooth as an entry point for the implant as this is the least invasive surgery available creating a tangible balance between cost and benefit.[16] We imagined a fictitious company, MIBEC (Microscopic In Body Electronics Corporation) based in Cambridge to be behind the concept and put together a publicity film describing how it works, where it might be used and what the advantages the user might reap. With this material we took the project into the public domain.

When the proposal works as intended the designer can sit back and take advantage of the media to disseminate the concept in a manner far beyond anything achievable by the individual. With the Audio Tooth Implant our initial goal was to be published in both ‹Wired› magazine and ‹The Sun› newspaper. This describes the breadth of audience we hoped to reach: From the technology savvy reader of Wired to the tabloid, jingoist lowbrow sun with an average daily readership of 7 733 000 people.[17]

This process involved the sculpting of a model tooth (fig. 6.). This model was photographed in a studio and used to accompany the related text description of the concept. We discovered that this was really enough for the media to happily publish the concept requiring no further proof of reality or status:[18]



*Figure 7*→**III**
*Publicity for Audio Tooth Implant.*

Using the media allows for a concept to travel far and wide, working particularly well with new media such as Internet news sites and blogs due to their viral like nature. The designer has to be aware that in this space they have little control or ability to manage dissemination once in the public domain, thus concepts mutate and facts become embellished. With projects like the tooth implant this is not problematic as the core concept is simple enough for the message to be carried throughout, here it was simply the availability of an implantable piece of enhancement technology. The presence of this simple piece of information in the popular press allows for a vast audience to contemplate its meaning, occasionally offering comment and opinion:

*Dear Mr's Auger and Loizeau,*
*As a physician I believe the technology you describe in your press release, has the potential for producing immense social harm. This social harm would include psychological trauma, and angry behaviour in both the workplace and the home.*
.....
.....
*XXXXXXX X. XXXXXX, MD*
*Associate Professor of Medicine,*
*(Cardiology)*
*Stanford Medical School.*[19]

## Case Study: Form – Carnivorous Domestic Entertainment Robots

A brief foray into the world of design will yield a plethora of styles and languages. The domestic landscape is complex and varied but it is into this physical space that our speculations must exist if they are to be taken seriously. Many of the future visions we see at technology fairs and corporate publicity events are developed with entirely different motivations to those described here and as a consequence they can be about ostentatious displays of engineering prowess, marketing or hidden political agendas.[20]

One classic example of a speculative vision of the future is the robot. These often exaggerate their mechanical heritage by showing exposed metal, gears and cables. Alternatively workings are hidden by sleek, shiny, stylised, futuristic plastic and chrome. The fact that they are objects of the future leads to designers shaping them in a futuristic manner. In this way they resemble characters from science fiction, not tangible near future products with the potential to seamlessly enter our lives.

16 *Around the same period Kevin Warwick of Reading University was generating publicity for his Cyborg 1.0 project. Exploring similar issues, Warwick had an RFID tag implanted in his arm enabling him to automatically unlock his office door and turn on lights. The question we ask is would one be willing to experience invasive surgery on a body part for such basic added functionality.*
*See: http://www.wired.com/wired/archive/8.02/warwick_pr.html*

17 *Source: http://www.nmauk.co.uk/nma/do/live/factsAndFigures?newspaperID=17*

18 *For example, the only dialogue we had with Time magazine (who called it ‹one› of the coolest inventions of 2002) was how much we would charge for them to use the image of the tooth in the magazine.*

19 *The whole correspondence ran two pages of writing offering a detailed description of exactly how and why the Tooth Implant would cause immense social harm.*

20 *Richard Barbrook's ‹Imaginary futures,› offers an insightful explanation of the technologies on display to the public at the New York World Fair in 1964 and the hidden cold war agendas behind them.*

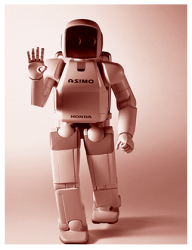


Figure 8→III
Asimo by Honda Corporation (2000 -)

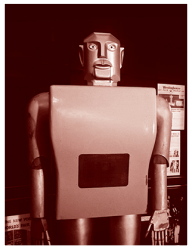


Figure 9→III
Electro by Westinghouse. (1939)

By applying a standard design approach, specifically a sensibility towards the domestic landscape and the people who live there, an entirely different aesthetic is born. This approach was adopted for our series Carnivorous Domestic Entertainment Robots (2008). Their formal style was informed by contemporary movements in furniture and household design with the primary intention of creating desirable objects.

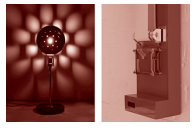


Figure 10→III
Carnivorous Domestic Entertainment Robots
(Auger-Loizeau, 2008)

The obvious disparity between these and normative robot forms encourages the viewer to challenge their preconceptions on the subject, whilst their familiar domestic language allows for their presence to be more easily projected into the home environment. This has the effect of drawing the audience into the fiction; the more complex motivations behind the project can then begin to unravel. This complexity means that the mass media approach to dissemination is problematic and whilst the Carnivorous Domestic Entertainment Robot series has received much publicity on internet forums, websites and newspapers, the level of comment and discussion is predominantly of a facile nature and the larger philosophical issues become lost. Far more successful as a means of presentation are the gallery space, conference or more intellectual media where the real questions underlying the concept can be discussed.

## Case Study: Interaction – Happylife

How we interact with technology and how we interact with products can be seen as two entirely different activities. Predominantly technology is used by experts for specialised functions in well-defined contexts. The development of technologies emerging from these areas and can be motivated by extreme circumstances and pressures such as defence and national security. In these contexts this development mostly goes unquestioned as it happens outside of public knowledge or during times of conflict where the worst-case scenario would be infinitely worse than the application of the technology. It is however, often via these channels that technology creeps into everyday use. One ongoing example of this shift is the (pseudo) science of polygraphy. With a history going back over a century, lie detection devices were originally tools used by experts on potential criminals, spies and paedophiles. Although the credibility of lie detection devices have long been in question their progression into popular culture is ongoing. We now regularly see lie detectors on daytime reality television programs being used to mediate family disputes and solve



fidelity issues. Interaction is still through ‹technology› and an expert, as this adds to the spectacle and enhances the sense of technological infallibility.
As sensing technologies become more capable their potential to play a substantial role in our everyday lives becomes evermore likely. To fully achieve this they must mutate into products or become part of our domestic spaces. Here is where their impact would be fully felt, in the everyday, mediating normal interactions and experiences.
These issues were explored in a recent project, ‹Happylife›, created in collaboration with Aberystwyth University Computer Science Department. The project was part of the Impact exhibition, a collaboration between science and design exploring the importance of engineering and physical sciences in all aspects of our lives.[21]

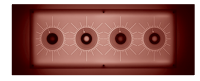


Figure 11→III
Happylife display (Auger/ACSD, 2010)

Aberystwyth's ongoing research involves utilising a high-resolution thermal image camera to detect malicious intent in individuals passing through border control points. The camera detects minute changes in temperature in various predetermined areas of the face and track these changes over time, for example as stress levels rise during periods of questioning.[22]



Figure 12→IV
thermal image camera

The fiction begins by applying the camera in a family home and imagining the effect of its presence over a period of 15 years. This shift of context is primarily intended to remove the obvious justifications that exist when applied to national security and border control.
The design of the device presented a complex challenge. Stylistically it was required to meet the same criteria as described earlier, looking comfortable in the modern home. Falling into the domain of the smart home and elements of affective computing,[23] I was aware that several previous research projects had explored issues of mood reading and mediated ambience. It was important for this project to move beyond these issues for it to enter into a space similar to Freud's uncanny,[24] in this way the function of the technology moves beyond the banal into an uncomfortable domain where its presence should be both questionable and dark but at the same time understood and occasionally beneficial. This was achieved by playing to the real life happenings of the nuclear family in their home. In the home interactions are personal, influenced by real life experiences, emotions and issues. We built a visual display (Fig. 11) linked to the thermal image camera (Fig. 12). This employs facial recognition to differentiate between members of the family. Each member has two rotary dials,

21 16 Science research teams were paired with designers from the Royal College of Art, Design Interactions Department to work together to produce conceptual designs.

22 During initial testing the camera showed substantial thermal differences during different conditions. For example during tests for stress induced by lying core temperatures around the eye area went up and in the cheeks went down. Reading poetry to the same test group had the opposite effect.

23 The study and development of systems and devices that can recognize, interpret, process, and simulate human emotions.

24 The Freudian concept of an instance where something can be familiar, yet foreign at the same time, resulting in a feeling of it being uncomfortably strange.

these show current state, taken from the most recent thermal image and predicted state, based on the processing of accumulated statistical data. There is no written calibration on the dials; it is left to the viewer to interpret the position: «Is it where it was this time last month?» «Why is my wife's dial so far round?» Thus inducing contemplation and questioning on issues that might otherwise have gone unnoticed. It is technology introduced into the most personal and emotional aspects of human life, mediating relationships and predicting moods. To communicate some of the possibilities of the concept, five complex narratives have been presented as vignettes, written in collaboration with poet Richard Marggraf Turley:



*Figure 13*→**IV**
*Happylife scenarios (1 of 5)*

The aim of these was to highlight poignant real life family scenarios that the audience might relate to. Should these narratives have been wholly dystopian then their ability to invoke contemplation and discussion would have been limited. It is a common trait of science fiction to err towards the negative and the shocking when describing emerging technologies. In the case of smart homes for example both Ballard's psychotropic house from «The Thousand Dreams of Stellavista,» (1962) and Ray Bradbury's Happylife Home from «The Illustrated Man» (1952) from which this project takes its name, culminate with the smart home subjecting the characters to dark and threatening physical and psychological trauma. This results in the fiction being of a cautionary nature. Design fictions should sit on the fence; their strength coming from the viewer being encouraged to draw their own conclusions.

## Case Study: Alternative presents – Iso-phone

Here we have a slightly different methodology. As we are shifting the here and now we effectively create a new ecology; a space for suggesting how things could be should we choose alternative influences or motivations to those directing mediated experiences today. The Iso-Phone was developed at Media Lab Europe (the European partner of the MIT Media Lab) in 2003.



*Figure 14*→**IV**
*Iso-phone (2003)*

The caller is floating in a pool, wearing a helmet that blocks out all peripheral sensory input whilst keeping the head above the surface of the water. The water is heated to body temperature blurring the boundaries of the user's body. In combination, a space is created to provide a pure, distraction free environment for making a telephone call. The only sensory stimulus presented is a two-way voice connection to another person using the same apparatus in another location.

Again acknowledging the rise in popularity of the mobile telephone in contemporary society, this project challenged the experiential quality of mobiles as communication devices. The wires that connect a product to an environment effectively dictate the aesthetic experience. In the case of the telephone box[25] the designer didn't just consider the product (the telephone) but also the environment in which it would be used. The phone-box withdrew the caller from normal public street activity into a temporary interstitial space; a sensory dislocation facilitating a focus on the tele-conversation and a diminished feeling of the ‹real-world.› Wireless technology breaks these contextual chains and as such it is no longer the designer who dictates the setting of the conversation but the user. This represents a profound step in the way technology is experienced. This project addressed this issue by creating the perfect contextual conditions for remote conversation thus challenging the move towards efficiency and shallow interactions as provided by mobile telephones and the services they facilitate.

Judged by contemporary sensibilities these fictions can seem far-fetched. Whilst the Iso-phone was build as a fully functioning prototype, it was taken less seriously as a concept than the Audio Tooth Implant, which was from a technical perspective, pure fiction. This is not really surprising as stepping out of well established and popular systems to imagine new ways of behaving, no matter how sympathetic to real human needs, alienates through the inherent strangeness. Here subtle methods of dissemination are imperative if the concept is to be taken seriously. If the concept has the potential to operate on a fully experiential level, inviting the audience to participate can entirely overcome the conceptual oddness.

The Iso-phone was built as a fully operational prototype. This comprised the design and construction of two 1.5M diameter by 2.4M tall steel tanks with incorporated 3 phase water heating element and two Iso-phone helmets. These were presented at the Ars Electronica festival in 2003. We were situated in the main square in Linz, the nature of this public space meant that over the 4-day course of the festival we received not only the technology aware attendees of Ars Electronica but also the people of Linz who happened to be passing. The live demo of the Iso-phone was also a common feature at Media Lab Europe open houses. Representatives, researchers and designers from the large telecommunication companies sponsoring the lab would attend these open houses and in this way we could talk directly with the people responsible for putting mobile phones on the marketplace, highlighting through the demo alternative ways of thinking about their design process.



*Figure 15*→**V**
*Iso-phone at Ars Electronica*

This is the purest method to communicate a concept, the Iso-phone genuinely created an extremely immersive and embryonic physical space that the written word fails to do justice to. This presents a large problem when attempting to communicate the project to the remote audience. To go some way towards bridging the gap between the experiential and the remote we produced a video of the project.[26] This slightly limits the loss of experiential purity whilst allowing for a more extroverted form of dissemination.

## Case Study: Personalising the fiction – Afterlife

If the speculative object or service is to be truly impactful its audience must be able to project its presence into their lives. This is possible with even the most profound proposals by eliciting an emotional connection with the theme.

25 *For example the classic British telephone box designed by Sir Giles Gilbert Scott.*

26 *This can be viewed here: http://www.auger-loizeau.com/index.php?id=2*

In 2001 we first presented the ‹Afterlife› project. The initial proposal concentrated on the metaphysical issues surrounding areas of faith, bereavement and the general shift from belief systems upheld by organised religion to the more factual basis of science and technology. Here the fiction was imagined as a more palatable alternative to certain movements already in practice.[27]



*Figure 16*→**v**
*Afterlife coffin with MFC.*

Under normal circumstances on burial, the human body would be assimilated into the natural system. The Afterlife device intervenes during this process to harness the body's chemical potential and convert it into usable electrical energy.[28] This electricity is contained within a familiar dry cell battery allowing the bereaved to choose where, when and how to use the energy.

In 2009 we were invited to present ‹Afterlife› at Experimenta 09 in Lisbon. This provided an opportunity to analyse the projects strengths and also to question how it could be more successful in touching on the sensibilities of the audience. We felt that in previous exhibitions people focused more on the physical concept, expressing distaste and even repulsion at the material process and thus failing to engage with the more emotional and personal aspect. Given the opportunity to address this problem we invited 15 respected friends and colleagues to propose what they would do with their own Afterlife battery or with that of a loved one. They were also asked to write a short paragraph describing their choice:



*Figure 17*→**v**
*Afterlife battery concepts*

Due to its extremely personal nature the concept only begins to genuinely resonate when the viewers start to dream about their own Afterlife desires. The breadth of concepts proposed allowed for the audience at Experimenta 09 to relate personally to some of the ideas making them extremely emotional and in some cases moving.

## Conclusions

Before writing this essay I hadn't consciously thought of my practice as involved in the creation of fictions. For me the word fiction takes us too far away from reality, rendering the designed concepts, by definition, unreal. The problem perhaps lies in the scope of possibility of a fictitious thing (from extremely impossible or unreal to bordering on reality); the motivation behind the fiction (entertainment, marketing, critique) and the perspective from which it is viewed (academic, industry, public). The fictitious tag makes sense in the context of this conference and the larger design research community where we are observing output from the perspective of third person omniscient; a godlike all knowing viewpoint where methods, motivations, values and audiences are discussed. Here the fictional status of the designed concepts is the point of discussion. But what about other contexts, the domains where these fictions ply their wares and meet their popular audience. If that audience believes the concept to be real does it cease to be a fiction? Here they might better be described as design factions: a form of verisimilitude where truths are blurred and disbelief is suspended. Thinking once again about ‹The War of the Worlds,› I remembered reading about Orson Welles' famous radio play of 1938 that created widespread panic due to its realistic delivery. Looking more closely into why this particular broadcast was so successful in bringing fiction to life it became apparent that it was not down to just one factor but several disparate timely elements: The prevailing political and cultural atmosphere (Coming war in Europe; Munich Crisis of September 12-30th); the product used for the dissemination and it's contemporary relevance (the radio); the language and style of the broadcast (based on previous disaster broadcasts such as the crash of the airship Hindenburg) and the shift in setting from England to very specific real places in the United States (where the play was broadcast).

It struck me that the techniques employed by Welles bear many similarities to those used in the creation of design fictions, effectively the crafting of complex narrative or artifice using the real life ecology where the story is applied; contemporary media, familiar settings and complex human desires. It is these delivery methods that differentiate design fictions from their science fiction cousins. We predominantly experience sci-fi through film, television, novels or comics and as such consciously and willingly enter into the fiction as soon as the curtain rises or the book is opened. Reality is temporarily suspended until the end credits roll and normal life clicks back into place. Design fictions are played out in real life. The presence of the designed artefact in popular culture allows for the viewer to project its presence into their everyday life. Then they effectively become the protagonist in the story, playing out individual and informative roles. Their reactions becomes the true products of this form of design research: The comments on blog pages; the emails sent, the letters written and the discussions had.

This, for me, is the purest form of speculative design. A space where we can honestly question the role technology plays in our lives free from vested interest. It is a space for dreaming, provoking and challenging. With a slight shift in methodology though, design fictions can be applied in a commercial context. In this domain the audience becomes the customer and as such their interests must be considered, limiting intellectual and creative freedom. Usually in this context the designer is working with a specific technology or product in mind, as we saw earlier these products have mostly progressed through small and logical iterations. The complexity of production lines, knowledge bases and brand identity lead to most companies staying on their tried and tested paths. Here the fiction allows for a high resolution glimpse into alternative possibilities. The strength of the speculative methodology is that objects do not need to work; their primary goal is to communicate. The engineering approach usually employed in industry can be limited by its close ties with reality, its methods leaning towards provability, hard laws, definitions and an end goal of realisation. Design methods can focus on communication, therefore prototyping ideas rather than hard technology, offering believable tasters of concepts before they become reality and applying genuinely unorthodox perspectives on technological and product development. The speculative artefacts created

*27 This shift of belief is evident in the context of cryonics, where people pay to be frozen and held in stasis until technological advances provide cures for illnesses that are presently un-treatable.*

*28 By employing a microbial fuel cell: a device that uses an electrochemical reaction to generate electricity from organic matter.*

here can be disseminated into popular culture operating in a similar way to Haute Couture in the fashion industry or concept vehicles in the motor industry. They can be both marketing tools showing the creative imagination of the company behind their existence or a feedback mechanism offering valuable insights into the public interest in certain technological directions or concepts.
The final important audience for design fictions is scientists and engineers. In the best case they become part creator of the fiction by working in collaboration. This approach is relatively new[29] and allows the designer to operate far upstream from where normative commercial design activity takes place. As this activity gathers momentum more opportunities are beginning to arise such as the recent Impact Exhibition at the Royal College of Art (see Happylife). This was organised by the main UK government agency for research funding in engineering and the physical sciences (EPSRC) and was intended to examine how this research might affect life in future Britain. This is extremely refreshing and timely if we are to consider how poor scientists traditionally are at communicating their research and projecting its application into everyday life. The true challenge here is to remain free from financial, political or personal vested interest. Scientists can fear for their funding if the designer's output errs towards the negative but many emerging technologies have the potential to be profoundly disruptive thus creating the occasional paradoxical situation. Either we need to be extremely careful about who we collaborate with ensuring open-mindedness and a genuine concern for application or we operate on a less formal level, simply checking scientific facts and technological possibility on a need to know basis.
Speculative design, when practiced with a discerning hand, does have the potential to challenge our laissez faire attitude towards technological application and development. Many of our current problems stem for the attitude that technology equates directly to progress:
«Why has a culture so firmly based on countless sophisticated instruments, techniques and systems remained so steadfast in its reluctance to examine its own foundations? Much of the answer can be found in the astonishing hold the idea of ‹progress› has exercised on social thought during the industrial age. In the twentieth century it is usually taken for granted that the only reliable sources for improving the human condition stem from new machines, techniques and chemicals. Even the recurring environmental and social ills that have accompanied.»[30]
By eschewing the commercial ties to industry the designer can operate in a genuinely critical fashion exploring not just the applications of a technology but also the implications. Speculative designs must be aimed at creating discourse not revenue, hypothetical products not real ones. Speculative Futures and Alternative Presents should inspire the audience into thinking not only what they do want for their contemporary and future selves but also what they don't want, encouraging a more democratic way of thinking about how technology enters and mediates our lives.

*29 The are clearly examples of designers or artists collaborating with scientists historically, but here we are specifically talking about the realm of speculation and critique.*

*30 Winner, Langdon: Technologies as forms of life, Essay in Kaplan 2004.*



## References

*Ballard, J.G (2001). The Thousand Dreams of Stellavista. Flamingo, London. (First published 1962)*

*Barbrook, Richard (2007). Imaginary Futures. Pluto Press, London.*

*Basalla, George (1988). The Evolution of Technology. Cambridge University Press.*

*Baudrillard, Jean (1996). The System of Objects. Verso, London. (Original work published 1968)*

*Bradbury, Ray (2008). The Illustrated Man. HarperCollins Publishers, London. (First published 1952)*

*De Botton, Alain (2004) Status Anxiety. Penguin Books Ltd, London.*

*Digard. J.P (1990) L'Homme et Les Animaux Domestiques: Anthropologie d'une Passion, Fayard, Paris.*

*Dinello, Daniel (2006). Technophobia!: Science Fiction Visions of Posthuman Technology. University of Texas Press, Texas.*

*Eames, Charles & Ray (1973). A Computer Perspective. Harvard University Press, Boston.*

*Ellul, Jacques (1964). The Technological Society. Vintage Books, New York.*

*Elton, Charles (1966). Animal Ecology. Methuen and Co. Ltd, London. (Original work published 1927)*

*Gibson, James. J (1986). The Ecological Approach to Visual Perception. Psychology Press, New York.*

*Kaplan, Daniel, M (2004). Readings in the Philosophy of Technology. Rowman & Littlefield Publishers, Inc, Maryland.*

*Kraybill, Donald B (1999) The Riddle of Amish Culture. The John Hopkins University Press, Maryland.*

*McClellan III, James E. & Dorn, Harold (2006). Science and Technology in World History. The John Hopkins University Press, Baltimore.*

*McKibben, Bill (2004). Enough: Staying Human in an Engineered Age. Henry Holt and Company, LLC, New York.*

*Miller, Daniel (2008). The Comfort of Things. Polity Press, Cambridge.*

*Ortega y Gasset, José (1995). Meditations on Hunting. Wilderness Adventures Press, Inc, Montana (First published 1972)*

*Podberscek, Paul & Serpell (2000). Companion Animals and Us, Cambridge University Press.*

*Turkle, Sherry (2007) Evocative Objects. MIT Press, Boston.*

*Wells H.G. (2004). The War of the Worlds, Pheonix, London. (First Published 1898)*

*Winner, Langdon (1970). Autonomous Technology. MIT Press, Boston.*

*Winner, Langdon (1986). The Whale and the Reactor, The University of Chicago Press, Chicago.*

*James Auger*

James Auger has a BA in Product design from Glasgow School of Art and an MA in Design Products from the Royal College of Art in London. He worked as a Research Associate for Media Lab Europe (The European Partner of the MIT Media Lab) where the main focus of his research was a design-based investigation into technology mediated human experience. He now teaches in the Design Interactions Department at the Royal College of Art in London and is a PhD candidate in the same department.
James is a partner in the speculative design practice Auger-Loizeau (www.auger-loizeau.com), whose projects have been published and exhibited internationally, including MoMA, New York, 21_21, Tokyo, The Science Museum, London and the Ars Electronica festival, Linz, Austria.

Julian Bleecker Near Future Laboratory, Venice Beach California. Nokia Design, Los Angeles, California

# Design Fiction: From Props To Prototypes

Keywords: design, science fiction, Star Trek, innovation, creativity, film

Thinking through fiction to comprehend the action of design is a way to invigorate what design could be, beyond the routine, everyday notion of what of design does. Designing with the impulses and motivations of fiction offers allows design can speculate in an articulate, writerly way – thinking through to the unexpected, unconventional, undisciplined and unheard-of. This paper lays out some theoretical and practical aspects of design fiction.



## A Technical Manual from the Future

Franz Joseph was an expert technical draftsman working in the aerospace industry in Southern California during the heady, ‹Skunkworks› days of the 1970s. He started a special project so advanced and speculative that it taunted belief. To call it ‹high tech› missed the mark by a few hundred years. The designs he was creating were beyond anything that had been done before. Laboring using traditional draftsman's drawing tools and without the aid of today's sophisticated illustration and computer-aided design systems, Joseph created a set of technical documents from the future, diagramming the details of technology so advanced and of such sophistication that the possibility of its existence teetered between fact and fiction. One wouldn't have been off the mark describing his work described the contours of the future. Indeed, his designs were so fantastic and seductive that when he published them In 1976, they became a New York Times best selling book.

Joseph's Technical Manual was a DIY shop manual for the science fiction world of Star Trek. It was a service and repair guide for tricorders, warp drive engine rooms and hand phasers. Using his practical skills as a draftsman Joseph was able to extend the science fiction of Star Trek, telling his own stories about that world through technical diagrams, political policy documents and engineering schematics. The imminent plausibility of his drawings created an entertaining, overwhelming reality effect. He played with our minds, entertaining us by blurring the broad line between fact and fiction.

A world with a Technical Manual has complex, fragile technology like tricorders and communicators and captain's chairs that gets used by people and break down and need repair. Technical diagrams of science fiction props that imagine them as real, everyday, objects forces one to imagine these devices in use. Even science fiction devices need service manuals because, in the fiction, they don't always work and must get serviced. They get serviced because they get used – and broken from use. Like buried artifacts found in an archeological dig from the future, we are left to fill in the gaps and knit together the stories suggested by the peculiar objects he drew. Was a particular component in the first version of the tricorder susceptible to failure under the conditions particular to expeditions to, say – class K planets? These questions are precisely the sort that the Star Trek Technical Manual provokes, implicitly. In its own quiet yet powerful and evocative way it provides fuel for the imagination, making one think of a workbench somewhere in the year 2300 where a scrawny technician is puzzling over an intermittently functioning anabolic protoplaser or universal translator. Even fantastic, impossibly sophisticated technology has its ordinary, broken down moments.

Making the extraordinary ordinary is a recurring genre convention for science fiction. Because of its creative elasticity, sci-fi is able to make strange, implausible ideas mundane and everyday. The Technical Manual does precisely this, making the unreal seem real, even routine and plain. When it does this, the extraordinary becomes tangible and possible. We are drawn into the possibility that even our wildest imaginings can be realized. Whatever we can dream can happen. We can prototype a future with a good story and a hand full of evocative props.

A favorite example of this sort of reality effect is Michael Horn's short film ‹Death Star over San Francisco› in which the Galactic Empire visits San Fran-

cisco during Fleet Week. We see the almost banal spectacle of an Imperial Trooper, 10 meters up on an AT-ST poking his head out of the hatch and coaxing a passerby to toss up something they've dropped on the street, perhaps the keys to start the walker. Elsewhere we see an Imperial Transport Craft making a landing on the roof of an apartment building, as ordinary as anything you might see around San Francisco. The footage is rough and un-produced, with off-camera banter about barbecues and the rustle of wind on a microphone, clearing the way for us to imagine this as the product of an everyday tourist out and about during a holiday weekend.

Another example of a similar kind of reality effect is filmmaker Floris Kaayk's fictional documentary ‹Metalosis Maligna.› Kaayk ‹documents› a disease that arises from the widespread proliferation of metal implants. Visually, it plays tricks on us, forcing us to consider the reality of this condition. By using the conventions of the documentary – talking head experts, dramatic footage of people suffering horrific metal lattices protruding from their bodies, reserved voice over commentary, and so on – we are drawn into the possibility of this slightly sinister malignancy. Our willingness to accept a strange, otherworldly circumstance is heightened by the visually compelling short story and its reflection of a familiar, sober medical news documentary style.

The brilliance of these short films lies in their own simple, almost naive proposition, which is similar to Joseph's specific kind of diagrammatic creative story telling. They all teeter playfully between fact and fiction. These design fictions stretch the constraints of reality by taking the genre conventions of technical drawing, hand-held holiday videos and news documentary and unassumingly fill out the contours of a slightly real, slightly fictional world. They allow for a different kind of engagement with a speculative idea. They draw it out, specifying it ‹as if› it were part of the world already. The Technical Manual, like ‹Death Star over San Francisco› lives somewhere in between speculation and materialization, in between an idea and that idea put in the hand to ponder over and consider. The fiction comes off the screen just a bit and gets closer to reality.

Why do we get drawn in and allow the reality of the fiction to consume us to the extent that we ourselves begin to extend the story and fill in its contours? Because the props and their stories that they live within and the details of their design are evocative enough to draw us in, compelling us to wonder and imagine. Things become imminent in a really good design fiction and we cannot help but to consider their possibility. They are familiar enough to our everyday that they are legible, yet different enough that they suggest that things have changed slightly. wThis playful flirt between familiarity and difference means that the design fiction world has come from ours. We have made an investment in helping to tell the story and imagine the fictional world.

How does this happen? These design fictions exploit genre conventions suggesting that these objects exist. They are presented simply and without embellishment. The otherworldly, spectacular things are made quotidian and even boring by presenting them as matters-of-fact, everyday and perhaps even old news. Enjoying the stories that surround them means we become an observer in this world, identifying with the characters and their world in which the things we might otherwise find extraordinary are quite ordinary. Neither the story nor the characters fetishize what would otherwise be miraculous events, objects and experiences and so we relegate them to our mental catalog of the normal and the routine. The extraordinary becomes ordinary and, therefore, possible.



## Design Fiction: New Practices for Making and Innovating

The Technical Manual makes me think about new ways of making, creating and prototyping. It would be useful in the design world to prototype things in a way that help us imagine and wonder and consider unexpected, perhaps transformative alternatives. Rather than the canonical engineering prototype that operates as a proof of technical feasibility, suppose we think about prototypes that are more like props? Material things, off the page and in the hand that help tell a story or start a conversation about how things could be different or a little bit better. They don't test in the technical sense, but probe the larger set of questions that inevitably surround new, provocative and transformative ideas. These design fiction props and prototypes would be things that help one imagine and tell stories about new near future objects and their social practices. Design fiction allows one to do the design work for things and ideas that are too speculative for reasonable, balanced people. They tell stories the same way a good science fiction does – immersive, imaginative and imminent.

This kind of prototype has nothing to prove – it does not represent technical possibility. The technical prototype serves the purpose of proving whether or not instrumental functionality is possible. Design fiction prototyping – or design fiction prop making – communicates possibility through the stories it evokes and the conversations it starts. The design fiction prototype helps the imagination's capacity to think beyond conventional assumptions about what comes next. It does not assume that innovation is about the same old stuff only now faster-smaller-brighter and better battery life. Design fiction helps throw out these assumptions and introduce new, alternative ones that form the basis for new ideas, new methods, new contexts and new experiences. It does this by deliberately blurring the line between fact and fiction. Design fiction allows us to re-think and re-imagine what can be possible.

Design fiction prototyping fashions tangible, materialized story elements that are simultaneously speculative and imminently possible. Design fiction does not create specifications for making. Rather design fiction creates specifications for imagining. The design prototypes expresses possibility more powerfully than either fact or fiction could do if they were each left to their own intellectual and creative provinces.

Design fiction is a way to speculate seriously. It's not quite brainstorming, nor is it ideating. It is not only a way of introducing bizarre technology concepts – nanotech, picotech, radical atoms, painted bits. It is also a way to begin conversations that question assumptions about what the future is for, what it contains, and what counts as an advancement ‹forward› towards a better, more habitable near future world. In the way that science fiction is able to hold a mirror up to society and raise questions about where we are and where we are going, design fiction can do likewise.

## The Future Can Be Otherwise

The continuing-advancement fiction, close cousin to the idea that things are always getting bigger, smaller, brighter, cheaper – the ‹up and to the left› model of evolution – is an unyielding force of capital that propels itself by the flows

of ambition, desire and hubris. Because we are engaging science fiction, and because we are engaged in the practice of design, design fiction can break with this model of scientific and technological advancement and materialize alternatives. Design fiction allows for ways to explore different underlying assumptions. It finally allows us to insert subplots and exceptions that play out different possibilities for the future.

Design fiction does this by using design to tell stories. It creates material artifacts that start conversations and suspend one's disbelief in what could be. It's a way of imagining a different kind of world by outlining the contours, rendering the artifacts as story props, then using them to imagine new possibilities. The prototyping/prop-making activates the idea, giving it a few material features and some density, and forcing the refinement and consideration that comes from making something material. A design fiction could be as simple as an object that proves curious enough to ask questions about, or to ponder over with the hand and eyes and imagination. The object talks to us, inviting us to fill in the larger story about where it comes from, how it operates, who possessed it and why.

That in-between is what Franz Joseph captures in his Star Trek design-fiction mechanical drawings. The sparseness of words contrasts with the drawing details in such a way that one wonders about the implicit sophistication of these devices. Are they real? Where and when did this manual come from? Questions and conversations might follow. This is the seduction of design-fiction at its best. The reader has to fill in the gaps and in the filling-in of gaps, we are made to imagine and wonder. And with these questions evolves a conversation that does not stop simply at the pragmatic, and does not dismiss as silly or impossible the fruits of imagining.

Joseph's drawings are not just technical specifications or paper prototypes – they are little story elements like props materialized to help flesh out a story, add creative seasoning to Star Trek and help bring it all to life more completely for the story's fans. The canonical, engineering prototype is something else – a test of translations and articulations of ideas in material. Joseph does something different here. He is helping to tell a story by extending it and adding to it. He is designing with fiction.

We might wonder why other ‹real› engineering drawing and prototypes and specification sheets do not become New York Times bestsellers?

## Why Science, Design, Fact and Fiction?

Science fiction can be thought of as a story telling genre that creates prototypes of other worlds, other experiences, other contexts for life all based on the creative insights of the author. Whether a world elsewhere in the universe, or one that is ours only with shifts that displace it in time or culture, science fiction plays with our minds by shifting our point of view. Oftentimes it will do this with props – objects and devices and affordances that help transport us and shift our gaze to another time, and another technocultural world. The props that live in these stories are objects brought to life in the fiction. At the same time, they sustain the story, providing the contours, plot pivots and ornamentation necessary to the drama. They specify the broader technocultural milieu in which the story takes place. They make the technology make sense not as instrumental functionality, but as an expression of human cultural practices.



The best of science fiction turns the technology into a lens through which we are forced to look at a present state of affairs, or a possible future we are heading towards. Science fiction is cultural criticism done through a story. It is expected that a science fiction will speculate about the role that science and technology play in our lives. Science fiction can ask – what if? And then proceeds to answer that question with an allegorical story. It seems to me that this is a vital characteristic that can be borrowed and extended for design.

This is the way that science and design and fact and fiction collapse together. They all wonder what a world would be like, if.. They all spark conversations that wonder and compel us to imagine things otherwise.

Design fiction creates speculating objects. It creates conversation pieces, with the conversations being stories about the kinds of experiences and social rituals that might surround the designed object. The objects speak to us by forcing us to ask questions of them, and the world in which they might exist. Design fiction objects are totems through which a larger story can be told, or imagined or expressed. They are artifacts from someplace else, telling stories about the other worlds from which they come.

What are these stories? They are whatever stories you want to tell. They are objects that provide another way of expressing what you're thinking, perhaps before you've even figured out what your imagination and your ideas mean. Language is a tricky thing. It often lacks the precision we would like. How to express an idea that lives in the imagination? Materializing it in some fashion helps – getting it in the hand, in some way to have something to point at and ponder over and discuss. This is why these design fiction ‹conversation pieces› can be useful material. They can be designed to provoke the imagination and open up a discussion so as to explore possibilities and provoke new considerations that words by themselves are not able to express. This is heady stuff, but even in the simplest, vernacular contexts, such stories are starting points for creative exploration.

Design fiction is a way of exploring different approaches to making things, probing the material conclusions of your imagination. Design fiction removes the usual product design constraints that appear when designing for massive market commercialization – the ones that reasonable people in blue shirts and yellow ties call ‹realistic.› This is a different genre of design that is forward looking, beyond incremental improvements. It makes an effort to explore new kinds of social interaction rituals, relay new possible assumptions and principles that may yield simple new ideas that might count as innovative. Design fiction provides a more compelling way to communicate possibility. As much as science fact tells you what is and is not possible, design fiction understands that constraints are infinitely malleable.

## From Idea to Materialization: Using Props or Prototypes

An idea will find its expression, whether it is content to circulate as a conversation or restlessly seeks a more materialized form. Making prototypes is a way to extend an idea into its materialization. Prototypes move ideas out of the mind off the page and into the hand. We prototype to render and materialize ideas so that they can be shared and tested and allowed to circulate. They are plastic and malleable and can be expected to change both themselves and the

larger set of circumstances in which they exist. Prototyping renders an idea with a different degree of fidelity than can be expressed by sharing thoughts prior to their materialization.

In the world of engineering and technology, the prototype is a way to test the translation of technical specifications into their pragmatic, material form. The prototype is a way to survey the material complexities of an idea – how do electrical components behave together in such-and-so configuration? Do they stick to the expected functionality as described in the specification?

The specifications are a step along the way to the idea's materialization. The specification makes the idea terse and less open to speculation. It is an engineering ritual and part of the language of a technocratic world to specify an idea in the genre conventions of the ‹spec.› Engineering prototypes are the penultimate materialization of a collection of nearly endless discussions and circulations of documents, deployments of resources and expenditures of time and energy in order to move an idea from itself and get it off the page and in the hand. Think of the exhaust produced from the expenditure of intellectual, creative and bureaucratic energy to translate an idea into its material representation. This translation is a reforming of the moments of inspiration into its solid state. The tests of this translation is the engineering prototype, the refinement of the idea in material – oftentimes a refinement that lands far from the original idea.

The prototype is a way to test the feasibility of materializing the idea. This test questions the specification of the idea, probing its consistency with the underlying assumptions. Do the paper description of the functional specification render themselves properly when brought closer to the atomic configurations of silicon, copper, mechanical servos, light-emitting pixels and so that are collectively meant to represent the idea? Does it all work together? Can the idea be effectively translated into a material form that can be assembled with the necessary parts? Do the parts even exist, or must they be themselves newly made according to the demands of this new idea? Must new machining and assembly practices be developed? And so on. The prototype places demands on an idea that refine it and challenge its feasibility. These challenges naturally constrain what ideas can be considered which implicitly defines the boundaries of what is fact and what is speculation or fiction.

The prop lies at the other extreme. It is closer to fiction than fact. It helps tell a story by moving it forward. It is like Hitchcock's MacGuffin, an object that exists mostly to provide the impetus to tell a story. Design fiction does something in between the prop and the prototype. The design fiction object speculates about what could be without expecting that the ideas in the fiction will materialize in the same pragmatic form as a prototype. But like the prop it can provoke a conversations about what could be. The prop has the disadvantage that you cannot expect the same level of pragmatic materialization as the prototype. It has the advantage that props can inspire a different sort of ‹specification› – the conversations that activate the imagination, testing assumptions and provoking a wide range of explorations that include a variety of disciplines beyond the technical. The design fiction object circulates back and forth between prototype and story prop, influencing, challenging, questioning, blurring fact and fiction.

This is an idea that is explored in the technical paper ‹A Survey of Human-Computer Interaction Design in Science Fiction Movies.› In it the authors survey the way science fiction films ‹cite› current or speculated computer interface technologies. They are equally curious as to the ways that scientists and technologists use science fiction film as reference points and inspiration for their ‹real› science work. The paper describes a few examples of this circulatory loop between science fiction and science fact, each feeding off of the other to produce an intertextual conversation that may not be formal, but occurs nevertheless.

A more generalized and analytic description of this circulation of technology-based ideas and conversations is found in a forthcoming book chapter from David A. Kirby called ‹The Future is Now: Diegetic Prototypes, and the Cinematic Creation of the Future›. In it, Kirby, a historian and sociologist of science and technology, explains how science fiction film can be a way to prototype new ideas. He calls this the ‹diegetic prototype.› We might think of this as closer to the prop, only it is not quite inert. It still belongs to the realm of technology and technical product development because it is a kind of prototyping, only it uses the full resources of a science fiction film production as the test apparatus. Moreover, the idea behind the prop/prototype can be circulated to a very large audience – those who see the film – effectively clarifying visually and with a story what might be a rather confusing concept for a lay audience.

Kirby uses the example of the Spielberg/Cruise/P.K. Dick film «Minority Report› in which the idea of gesture-based computer interfaces are demonstrated within the tangled briar of a dramatic, science-fiction chase film. Kirby points out how the engineer John Underkoffler was able to use his role as a technical advisor for the film to evolve his own ideas about free-hand gesture interactions. In this role Underkoffler developed a set of principles, a gesture language, and some visual features that served the dual purpose of visual theater for the film and technical prototyping for Underkoffler's entrepreneurial ambitions. The film production becomes a unique resource for prototyping an idea by putting it to the test and giving it some context within a story. It also provides a reference point for a larger public understanding about what may be a possible extension of today's computer-human interfaces – shakeable, tilt-able, Nintendo Wii-like gesture interfaces – into the year 2050 when the ‹Minority Report› drama takes place. Certainly one amongst a variety of very good reason why the Nintendo Wii has become legible as a cultural artifact and interaction practice owes a debt to the gestural interaction scenes in ‹Minority Report.› Explaining what ‹gesture interface› means is much of what the film has provided to its audience, perhaps even more so than the central plot of power, corruption and an evolution of the capacity of the human mind to visualize the future.

Compared to a typical, staged technology demo, the diegetic prototype elevates the context by placing it within a larger fictional world. It is not the central attraction so much as a signpost indicating that things are a bit different. We can imagine the device more completely and are less likely to dismiss it, as might happen if it were presented as another tech gizmo absent a larger set of contexts and meanings. It is present, demonstrable and extant within the diegesis of the film. We have been prepared to accept what we see, particularly in a good fictional drama because we would rather enjoy ourselves and accommodate the vagaries of a good story's speculations than dismiss it and step outside of the drama.

Kirby's diegetic prototype is like a concept prototype, only with the added

design fiction property that there is a story that surrounds it rather than a drape of test equipment and puzzled engineers. The story – the science fiction – probes and verifies the concept and perhaps even enlivens it in a way that an engineer could never do the way a well-written story could. The story is more than a ‹user scenario› or a functional specification – which is itself also a kind of story, albeit terse, technical and lacking in drama. In a diegetic prototype, the characters are richer than scenario personas or marketing archetypes of humans. No one ever refers to people as ‹users› or ‹segmentation models› in a good science fiction story.
What good is the diegetic prototype? The diegetic prototype provides an opportunity for a technical consultant to speculate and extend their ideas within the fictional reality of the film, considering their work as more than a props maker or effects artist creating appearances. It is a prototyping activity as valid and committed as the action of a technologist specifying the functionality of their idea, only the materialization is represented in a story that is shared by an audience of millions rather than a few people involved in the development of some new gizmo. The film becomes an opportunity to explore an idea, share it publicly and realize it, at least in part and with the consistency necessary for film production rather than laboratory production.

«… scientists and engineers can also create realistic filmic images of ‹technological possibilities› with the intention of reducing anxiety and stimulating desire in audiences to see potential technologies become realities. For scientists and engineers, the best way to jump start technical development is to produce a working prototype. Working prototypes, however, are time consuming, expensive and require initial funds. I argue in this essay that for technical advisors cinematic depictions of future technologies are actually ‹diegetic prototypes› that demonstrate to large public audiences a technology's need, benevolence, and viability. Diegetic prototypes have a major rhetorical advantage even over true prototypes: in the diegesis these technologies exist as ‹real› objects that function properly and which people actually use.» (Kirby)
Kirby provides us with a fascinating insight. He is saying that a good story with its props may be a more effective at materializing an idea than an engineering prototype. We might wonder why more engineers are not drawn to story telling as a way to prototype their ideas, rather than circuit building or software prototyping. As a means to communicate and disseminate an idea, not much works as well as the circulation of a compelling story. Hollywood and the entertainment-media network has taught us this much, at least.

## Conclusion

Collapsing ways of making and prototyping with ways of imagining and telling stories may seem to stretch what is reasonable for the practical aspects of design. But, the opportunity for exploring new, even unexpected potentials introduces the possibility that designing with the genre conventions and story-telling idioms of science fiction may introduce a new kind of innovation practice.



## References

Horn, Michael. (2008). Death Star Over San Francisco. http://vimeo.com/2587071

Joseph, Franz. (1976). Star Trek Star Fleet Technical Manual. http://amzn.to/9L8JBW

Kaayk, Floris. (2006). Metalosis Maligna. http://vimeo.com/1192666

Kirby, D.A. (2009) «The Future is Now: Hollywood Science Consultants, Diegetic Prototypes and the Role of Cinematic Narratives in Generating Real-World Technological Development,» Social Studies of Science. February 2010 vol. 40 no. 1 41-70.

Near Future Laboratory. Design Fiction Chronicles Category List. http://www.nearfuturelaboratory.com/category/design/design-fiction/

Near Future Laboratory. Design Fiction: A Short Essay on Design, Science, Fact and Fiction

http://www.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/

Sterling, Bruce. Design Fiction Category List. http://www.wired.com/beyond_the_beyond/category/design-fiction/

Bleecker, J., Candy, S., Dunagen, J., Leonard, J. Pohflepp, S., Sterling, B. (2010). South by Southwest Design Fiction Panel Discussion. http://audio.sxsw.com/2010/podcasts/031310i_designFiction.mp3

Julian Bleecker

Julian Bleecker is a designer, technologist and researcher at the Design Strategic Projects studio at Nokia Design in Los Angeles and the Near Future Laboratory. He investigates emerging social practices and networked interaction rituals. His focus is on hands-on design, physical construction, prototyping, observation, prop-making and designed science fictions as a way to raise questions, tune in weak signals, reveal hidden insights and yield innovations that could make the world a more habitable, playful place.

He has a BS in Electrical Engineering and an MS in computer-human interaction. He earned his PhD from the University of California, Santa Cruz where his doctoral dissertation focused on science, fiction, technology and culture.

Franz Liebl Berlin University of the Arts, Germany,
FranzL@udk-berlin.de

# The Strategic Value of Art: What Strategic Management Can Learn From Leadership Hacking

Keywords: brand communities, business models, contemporary art, cultural hacking, leadership, participation, stakeholder, strategic management

Conventional approaches of measuring the use value of art in a business context tend to be conceptually dubious. Evaluation criteria are fuzzy and results lack coherence. Therefore, a fundamenteal reorientation is necessary: if art is to provide a major contribution for business firms, it has to address the level of strategic management. Thus the focus of interest is the ‹strategic value› of art. In other words, what can strategic management learn from (contemporary) art? Some preliminary answers were given by studies in the field of ‹Cultural Hacking›, which investigated subversive strategies of innovation in art and design. In this paper a major conceptual elaboration is made with respect to organizational processes of strategy-making and business-model development. This specific type of ‹Cultural Hacking› is called ‹Leadership Hacking› and will be illustrated by a comprehensive case study: ‹Ouest-Lumière›, the firm of Parisian artist Yann Toma.

The value of art has many aspects and is therefore measured by manifold criteria. In an economic context the value of an artwork is preferably represented by its pricetag. Some theoreticians emphasize that it is (only) the price that distinguishes an artwork from a regular consumer good (Museum für Angewandte Kunst 2002); Ullrich (2008a) puts it as follows: ‹prices make art›, as they frame the spectators' perceptions and can be used for purposes of conspicuous consumption. With respect to the value dimension, the price is primarily a valid indicator of the *exchange value* of an artwork. However when we focus on the *use value* of art, conventional approaches tend to be conceptually dubious. Evaluation criteria become fuzzy and results lack coherence: on the one hand, art consultants argue that art increases motivation by making staff happy; on the other hand, it is emphasized that art should provide a substantial provocation (Ullrich 2000). Bauer (2005) comes to the conclusion that research in this field needs a fundamental reorientation.

It is obvious that the search for alternative criteria represents a good starting point for a reorientation: if art is to provide a major contribution for business purposes, it cannot be reduced to the function of image sugarcoating as in the case of ‹corporate culture responsibility› (Liebl 2010a). Rather it has to address the level of strategic management, i. e. business strategy and corporate strategy. Thus the focus of interest is the ‹strategic value› of art. In other words, what can strategic management learn from (contemporary) art, or specific works of (contemporary) art, respectively?

## ‹Cultural Hacking›: Career of a Metaphor

Some authors (Borka 2007) argue that today subversion might be the only way to create innovations that result in sustainable competitive advantage. In a comprehensive review of the field (Düllo/Liebl 2005) a broad range of different types of subversive strategies of innovation – recodings, detournments, misappropriations etc. – could be identified in works of contemporary art and design. (Mis-)Appropriating a similar metaphor from Stewart Home (1996), I have introduced the term ‹Cultural Hacking› for this kind of cultural practices (Liebl 2001; see also Liebl 2010b). Typically, such works of art and design address issues of product design and product branding. This is not very surprising, as products and their accompanying claims, logos, packagings and advertisements are clearly aesthetic phenomena. It is not surprising either that brands of luxury firms and global players are among the preferred targets of artists; misappropriating and manipulating these brands does not only create attention, but can also be easily understood by a larger audience. This is particularly true for the works of Tom Sachs, Daniele Buetti or Svetlana Heger (Liebl 2005). And similarly, we can identify the rise of ‹Ikea Hacking› as both a mass movement of DIY enthusiasts and a practice in the world of contemporary art and design (Liebl 2008). The British association ‹RSA Design & Society› – which is part of the ‹Royal Society for the encouragement of Arts, Manufacturers & Commerce› – solemnly celebrates the practice of ‹Hacking› as «the personal creative spirit that has always underpinned human ingenuity. […] a collective term for a personal response to, and triumph over, the limitations of our physical world.» (Burnham 2009) Similarly, others recognize «the disappearance of the traditional boundary between the role of the designer and

that of the consumer [… as well as …] new and unprecedented levels of user participation which will have profound implications for the future of design and experience making.» (YBCA 2010)

One may find it encouraging that the practice of ‹Hacking› has now been elevated not only to a lifestyle but even to a *conditio humana* and has received widespread attention over the last years. However, the praise of ‹Hacking› as a general mode of existence runs the danger of losing one's focus and being naïve. Therefore, let us keep in mind that the primary interest of ‹Cultural Hacking› is on innovation and, recurring to the works of Groys (1992; 1998; 2008) and de Certeau (1980), on the underlying practices and strategies. This represents a terrain that is difficult to navigate, as it can no longer be mapped by well-known oppositions and simple conflict lines. It requires more complex approaches which are typical of artists and designers like Chicks on Speed, Dunne + Raby or Human Beans. They reveal the following pattern: while critically reflecting the current state of the art, they are nonetheless eager to cooperate with institutions and business organizations; their actions are playful and subversive, sometimes using parasitical and viral techniques. This aspect marks a major difference between ‹Cultural Hacking› on the one hand and the stream of ‹Culture Jamming› (Dery 1993) on the other hand which is popular with political activists in the tradition of ‹Adbusters› or the French ‹Anti-pub› movement. ‹Culture Jamming› is not about innovation but is regarded as a ‹Guérilla Kit› (Baba 2003) for resistance, criticism and discrediting adversaries – which in fact requires straightforward and simple friend-foe distinctions. In the final analysis, the role of subversion is fundamentally different: In ‹Culture Jamming› subversion represents the *aim*, while in ‹Cultural Hacking› subversion becomes a (preferred) *means* to create a desired or necessary innovation.

## The Next Level: ‹Leadership Hacking›

The unreflected enthusiasm about ‹Hacking› and its supposed consumer empowerment gives rise to a second *caveat*. It is important to note that when we speak of ‹Cultural Hacking› as a subversive practice, we should not restrict our focus to the sphere of consumption, i.e. to a mere ‹Product Hacking› or ‹Brand Hacking›. From the standpoint of management theory and practice there is a different breed of works that is not easy to find but even more interesting and relevant. These works by artists (and a few designers) address the context of general management and the corresponding leadership processes in an organization. In current management theory this comprises issues of business design, strategizing on a business and corporate level, and processes of decision making and mobilization. This specific type of Cultural Hacking is called ‹Leadership Hacking›.

‹Leadership Hacking› may take on two major forms: first, business models created by artists, as in the case of Superflex' open-source concepts or economic inversions (García-Antón/King/Brändle 2007; Albrethsen/Fabricius 2009), and, second, companies owned by or operated by artists. By such a company or business model I do not mean an artist's career strategy or the industry-like manufacturing of works which is typical of famous artists employing a large number of associates. Rather I mean companies and business models that can also be regarded as art projects in themselves, such as ingold airlines (Meighörner 2000), Com&Com (Edition Fink/Rutishauser 2002; Hedinger/Gossolt/CentrePasquArt Biel 2010), Chicks on Speed (Liebl 2006a), Maywa Denki (Tosa 2001; Liebl 2005), N.E. Thing Co. Ltd. (Allan 2002), etoy (Drühl 2006), Superflex (Steiner/SUPERDESIGN 2003; García-Antón/King/Brändle 2007), Bonk Business (Monthoux 2003), TAF (Liebl 2006b) or IKHÉA©SERVICES (Farkas 2004; Liebl 2008). The reader is also referred to the overviews given by Ullrich (2001), Bauer (2006), Huitorel (2008), Toma/Barrientos (2008) and Kelsey/Mir (2003).

While most of these projects can be basically regarded as business models, they tend to belong to the art sphere rather than to the sphere of entrepreneurship. Their prototypical nature and the abstract idea is more dominant than the practical implementation and a reality test. And although these projects may address issues of business models they hardly address issues of strategy and leadership as well. To date, the most complete, consequent and advanced project in this respect may be Ouest-Lumière, the firm of Parisian artist Yann Toma. In the remainder of this paper, the case study Ouest-Lumière will be presented in detail. First, a short summary of the history of the firm will be given; for a comprehensive overview see Ardenne (2004). Then the aspects of detournment in the business model and the leadership processes will be elaborated.

## Yann Toma's ‹Ouest-Lumière›: A Case Study in Leadership Hacking

Since 1903 Ouest-Lumière had run a power plant near Paris and had provided electricity to the western part of the city. After nationalization in 1946, Ouest-Lumière had become part of Electricité de France (EdF). In the 1990s its premises were abandoned by EdF. Toma who had used a part of the plant as his studio tried to document and preserve the remains as far as possible. Finally, in 1994, he acquired the brand for 1 French Franc from EdF and since then has run, as the official successor, Ouest-Lumière as a joint-stock corporation. The firm conforms to legal standards and is managed by a board with Yann Toma as CEO. Ouest-Lumière produces ‹artistic energy›, builds up corporate archives, uses various communication channels and launches advertising campaigns.

From a superficial point of view, this might be regarded as a nostalgic project by Toma who aims at preventing industrial heritage from oblivion; instead, there are some important modifications and detournments that are strategically significant with respect to both management and the art system.

Yann Toma sells the stocks of the corporation to art collectors; thus a collector becomes an owner of Ouest-Lumière and is registered. Already at that point we can see an important detournment with respect to organizational design and leadership processes, for the buyer has to choose a management position in the company: He or she has to invent an executive's post including the abbreviation which is typical of large corporations. Collectors have created and chosen for themselves positions like ‹Director of Clandestine Activities (DCA)›, ‹Director of Hopeless Cases (DHC)›, or ‹Director of Extraterrestrial

Relations (DER)›. In contrast to other companies that keep their organizational chart under secrecy, Ouest-Lumière has been carefully publishing its expanding orgchart in several editions (e.g. in Baverey 2004, Wright 2005, Toma 2007 and Toma 2008). The boundaries between inside and outside begin to dissolve, and also the distinctions between owner and employee or between collector and artwork.

From the perspective of organization theory, a shareholder becomes a (multiple) stakeholder, which implies manifold relationships of interacting with the company. In other words, the buyer has to do more than merely acquiring the artwork; he or she is more than a conventional customer. The acquisition is the starting point of a long-lasting ‹work in progress› – a process that is also quite different from the various forms of ‹service art› created in the 1990s (Janecke 2001). The collectors/customers/shareholders/employees are repeatedly invited to make contributions to the performance of the company – i.e. to provide ‹artistic energy› in order create value-added for the common project. E.g., for an exhibition on Ouest-Lumière shareholders were invited to formulate job descriptions for their directorates. Many of the executives did so, with a high sensitivity towards the absurdities of everyday life in organizations and of globalised operations (Debailleux 2006). Shareholder No. 36, ‹Direction de la Qualité Totale (DQT)›, formulated the task of her department as follows: «*La Direction de la Qualité Totale est constituée d'un commando d'enquêtrices incorruptibles et inoxydables qui veillent au contrôle qualité des flux radiants d'énergie artistique. La DQT s'est vu confier par le Président une mission sans fin: Faut-il tuer la qualité totale?*»

Thus the value of art is not so much depending on the willingness to pay but on the competencies collectors have and are able to deploy. The corporation is operated by a business system and leadership framework that, at its core, is based on participation. This is also reflected in the claim of Ouest-Lumière: «En cas d'oubli, prière d'en faire part.» Ouest-Lumière is based on community-building among collectors/stakeholders who are simultaneously linked to the company in several ways: as customers, as employees, and as shareholders. Most recently, management theory has developed a proper term for this advanced form of co-operative creation of value: ‹co-creation of experiences› (Prahald/Ramaswamy 2003). However, this is not just another case of ‹user-generated content› that is currently en vogue among product and advertising managers. The involvement documented by the shareholders'/stakeholders' contributions – this creative ‹energetic flow› of immaterial work – is by far higher, mainly because Ouest-Lumière is *their* company.

A similar degree of involvement is shown by the CEO himself. His business card presents him as ‹CEO for Life›. This marks a clear statement against accelerating job rotations of top managers which lead to business strategies that are no longer oriented towards long-term success but should optimize the bottom line on a short-term basis. This commitment to sustainability is not the only aspect of Ouest-Lumière's corporate responsibility. The company convincingly implements Russ Ackoff's (1974) idea that it is important for a company to address also the *aesthetic* needs of its stakeholders. This is done by providing a ‹part de jouissance› to shareholders/stakeholders, a concept that is explained below and seems more appropriate than the conceptually dubious ‹stakeholder value› from the management literature (for a critique see Liebl 1996).

Yann Toma leads his stakeholders/shareholders as a community – perhaps even as a (social) movement – and mobilizes their potential in various dimensions. This leadership system not only represents the current state of the art in management theory (see, for example, Voigt 2006, Hamel 2009); it also reflects advanced ideas on brand leadership that regard brand communities as being more than a bunch of fans who act as brand ambassadors. Rather, members of a brand community are actively shaping the brand by contributing ideas for product development or advertising campaigns. That is why marketing theoreticians like Cova (1999) emphasize the ‹link value› of a brand: i.e. a value that represents the community-building power of a brand, leading to sustainable competitive advantage. The example of Ouest-Lumière illustrates that this link value may be regarded an important part of the strategic value of art. Yann Toma (2007) emphasizes this fact by using the above-mentioned term ‹part de jouissance› which is not only difficult to translate but another important deviation from conventional mechanisms of the art system. The value created by community-building is fundamentally different from the value derived from social distinction and conspicuous consumption mentioned in the introduction. And the mechanism also points to a different role of the art collector. While art collectors, due to their supposed competence of selection, have now been regarded as an avantgarde of consumption (Ullrich 2008b), they change their character in the case of Ouest-Lumière and become – ideal employees. The latter is particularly interesting, because these people – who are often entrepreneurs or managers themselves – are willing to be co-opted and instrumentalized to work for Ouest-Lumière. They want to jointly ‹live the brand› (Ind 2001) Ouest-Lumière.

In the process of strategic leadership, mobilization is dependent on sensemaking and sensegiving (Voigt 2006) – an issue that has become increasingly important in Ouest-Lumière. This is mainly caused by the recent fundamental crises of the economic and financial system. However it is not because Ouest-Lumière may have been damaged by this downturn. On the contrary, Ouest-Lumière is expanding globally with an increasing number of foreign outposts and sees a multitude of opportunities to revive bankrupt firms by providing them with a new vision. In his recent body of work ‹Post-Bankrott›, Yann Toma investigates how to recode the value propositions of failed finance firms in order to formulate a sustainable strategic vision after having been acquired by Ouest-Lumière.

## Conclusion

With his company Ouest-Lumière, Yann Toma has launched an art project with a high ‹strategic value›. Toma does not mimic conventional management techniques but rather presents elements of a genuine management avantgarde. This includes innovative forms of value creation, participative leadership and sensegiving mechanisms. And it uses the community-based link value of the brand Ouest-Lumière. This bears several important implications. First, leading the brand, therefore, means leading people. Second, in the context

of Yann Toma and Ouest-Lumière ‹living the brand› does not mean that the artist's life becomes a ‹Gesamtkunstwerk› but that collectors as both shareholders/stakeholders and customers/employees jointly live and embody the(ir) brand Ouest-Lumière.

## References


Ackoff, R. L.: Redesigning the Future – A Systems Approach to Societal Problems; Wiley: New York 1974

Albrethsen, P.; Fabricius, J. (eds.): Superflex: Free Shop – Anything the Customer Wants to Purchase Is Free; Pork Salad Press: Copenhagen 2009

Allan, K.: Business Interests, 1969-71: N.E. Thing Co. Ltd., Les Levine, Bernar Venet and John Latham; in: Parachute, Vol. 106, Economies, April-June, 2002; pp. 106-122

Ardenne, P.: Sous le signe de la conduction; in: Baverey, M. (Hg.): Yann Toma: Ouest-Lumière; isthme: Paris 2004

Baba, M.: Guérilla Kit: Ruses et techniques des nouvelles luttes anticapitalistes; La Découverte: Paris 2003

Bauer, T. W.: Forschung zu Kunst & Wirtschaft neu orientiert: Von Kommerzialisierungsstrategie zu kultureller Innovationsstrategie; in: Brellochs, M.; Schrat, H. (eds.): Raffinierter Überleben – Strategien in Kunst und Wirtschaft: Produkt und Vision Reader; Kadmos: Berlin 2005; pp. 96-118

Bauer, T.: Cultural Innovation: What Strategic Management Can Learn From Contemporary Fine Art; Dissertation Universität Witten/Herdecke; Witten 2006

Baverey, M. (ed.): Yann Toma: Ouest-Lumière; isthme: Paris 2004

Borka, M.: Guerrilla Now!; in: DMY Berlin; Suermann, J. (eds.): DMY Internationale Designausstellung 2007; Berlin 2007; pp. 4-5

Burnham, S.: Finding the Truth in Systems: In Praise of Design-Hacking; RSA: London 2009

Certeau, M. de: L'invention du quotidien: 1. arts de faire; folio: Paris 1990 (orig. 1980)

Cova, B.: From Marketing to Societing: When the Link Is More Important than the Thing; in: Brownlie, D.; Saren, M.; Wensley, R.; Whittington, R. (eds.): Rethinking Marketing: Towards Critical Marketing Accountings; Sage: London 1999; pp. 64-83

Debailleux, H.-F.: Transfert de fonds indien: Yann Toma a promené son concept de société fictionelle de Delhi au Rajasthan; in: Libération, 21 Décembre, 2006, p. 26

Dery, M.: Culture Jamming – Hacking, Slashing, and Sniping in the Empire of Signs; Open Magazine Pamphlet Series: Westfield, NJ 1993

Drühl, S.: Der uniformierte Künstler: Aspekte von Uniformität im Kunstkontext; Kerber: Bielefeld 2006

Düllo, T.; Liebl, F. (eds.): Cultural Hacking: Kunst des Strategischen Handelns; Springer: Wien/New York 2005

Edition Fink; Rutishauser, G. (eds.): Com & Com: We Love You; Edition Fink: Zürich 2002

Farkas, J.-B.: IKHÉA©SERVICES; Zédélé: Brest 2004

García-Antón, K.; King, E.; Brändle, C. (eds.): Wouldn't it be nice… …wishful thinking in art and design; Centre d'Art Contemporain Genève: Geneva 2007

Groys, B.: Über das Neue – Versuch einer Kulturökonomie; Hanser: München 1992

Groys, B.: Der Künstler als Avantgarde der Ökonomie; in: gdi impuls, Vol. 16, #4, 1998; pp. 48-57

Groys, B.: Art Power; MIT Press: Cambridge, MA 2008

Hamel, G.: Moon Shots for Management; in: Harvard Business Review, February, 2009; pp. 91-98

Hedinger, J. M.; Gossolt, M.; CentrePasquArt Biel (eds.): La réalité dépasse la fiction: Lexikon zur zeitgenössischen Kunst von Com&Com; Niggli: Sulgen/Zürich 2010

Home, S.: Introduction; in: Home, S. (Hg.): What Is Situationism? A Reader; AK Press: Edinburgh 1996; S. 1-2

Huitorel, J.-M.: Art et Économie; Editions Cercle d'Art: Paris 2008

Ind, N.: Living the Brand; Kogan Page: London 2001

Janecke, C.: Service-Kunst. Nutzungsangebote in Projekten der Gegenwartskunst zwischen Bild und Vorgeblichkeit; in: Bühler, M.; Koch, A. (eds.): Kunst & Interkontextualität: Materialien zum Symposium schau-vogel-schau; Salon-Verlag: Köln 2001; pp. 225-276

Kelsey, J.; Mir, A. (eds.): Corporate Mentality: An Archive Documenting the Emergence of Recent Practices Within a Cultural Sphere Occupied By Both Businesses and Art By Aleksandra Mir; Lukas & Sternberg: New York 2003

Liebl, F.: Strategische Frühaufklärung: Trends – Issues – Stakeholders; Oldenbourg: München 1996

Liebl, F.: Wege aus der Retro-Schleife; in: brand eins, Vol. 3, #09, November, 2001; pp. 110-111

Liebl, F.: The Art and Business of Cultural Hacking: eine Bestandsaufnahme; in: Düllo, T.; Liebl, F. (eds.): Cultural Hacking: Kunst des Strategischen Handelns; Springer: Wien/New York 2005; pp. 181-228

Liebl, F.: It's Not How Good You Are, It's How Many Steal From You; in: Bidner, S.; Kunstraum Innsbruck (eds.): Der soziographische Blick; Verlag der Buchhandlung Walther König: Köln 2006a; pp. 284-294

Liebl, F.: Unbekannte Theorie-Objekte der Trendforschung™, Folge 55: Die Kunst der Kundenorientierung; in: Höhne, S.; Ziegler, R. P. (eds.): ‹Kulturbranding?› – Konzepte und Perspektiven der Markenbildung im Kulturbereich; Leipziger Universitäts-Verlag: Leipzig 2006b; pp. 113-135

Liebl, F.: Konsuminnovationen durch Cultural Hacking: Das Beispiel Ikea-Hacking; in: Richard, B.; Ruhl, A. (eds.): Konsumguerilla: Widerstand gegen Massenkultur?; Campus: Frankfurt/M. 2008; pp. 33-54

Liebl, F.: Corporate Social Responsibility aus Sicht des Strategischen Management (to appear in: Raupp, J.; Jarolimek, S.; Schultz, F. (eds.): Handbuch Corporate Social Responsibility; VS Verlag: Wiesbaden 2010a; pp. 305-326)

Liebl, F.: Stichwort ‹Cultural Hacking›; in: Hedinger, J. M.; Gossolt, M.; CentrePasquArt Biel/Bienne (eds.): Lexikon zur zeitgenössischen Kunst von Com&Com: La réalité dépasse la fiction; Niggli: Sulgen/Zürich 2010b; pp. 30-31

Meighörner, W. (ed.): ingold airlines – more than miles; quantum books: Friedrichshafen 2000

Monthoux, P. G. de: Bonk Business Inc.; in: Kelsey, J.; Mir, A. (eds.): Corporate Mentality: An Archive Documenting the Emergence of Recent Practices Within a Cultural Sphere Occupied By Both Businesses and Art By Aleksandra Mir; Lukas & Sternberg: New York 2003; pp. 118-125

Museum für angewandte Kunst (ed.): Ich denke, also kaufe ich/I Think, Therefore I Shop: Murray Moss im mak – New York in Frankfurt; Museum für angewandte Kunst: Frankfurt/M. 2002

Prahalad, C. K.; Ramaswamy, V.: The New Frontier of Experience Innovation; in: Sloan Management Review, Summer, 2003; pp. 12-18

Steiner, B.; SUPERDESIGN (eds.): SUPERFLEX/TOOLS Book; Verlag der Buchhandlung Walther König: Köln 2003

Toma, Y.: Part de jouissance; Editions Jannink: Paris 2007

Toma, Y. (ed.): L'Ouest-Lumière: La Collection; Editions Jannink: Paris 2008

Toma, Y.; Barrientos, R. M. (eds.): Les entreprises critiques: La critique artiste à l'ère de l'économie globalisée; Cité du Design Editions: Paris 2008

Tosa, M. (ed.): Maywa Denki Catalogue; Maywa Denki: Tokyo 2001

Ullrich, W.: Mit dem Rücken zur Kunst: Die neuen Statussymbole der Macht; Wagenbach: Berlin 2000

Ullrich, W.: Start-ups; in: artInvestor, Vol. 1, #2, 2001; pp. 28-30

Ullrich, W. (Hg.): Icons of Capitalism: How Prices Make Art; Dossi, P.; Nori, F. (eds.): Art Price and Value: Contemporary Art and the Market; SilvanaEditoriale: Milano 2008a; pp. 41-56

Ullrich, W.: Helden des Konsums: Immer mehr Kunstsammler begeistern sich für Gebrauchsgüter; in: Kunstzeitung, Vol. 143, #7, 2008b; p. 1

Voigt, T.: The Force of Mobilization: What Strategic Management Can Learn From Social Movements; Logos: Berlin 2006

*Wright, S.: Yann Toma: Faut-il abolir Ouest-Lumière?; Les Editions Incertain Sens / La Passerelle: Brest 2005*

*YBCA – Yerba Buena Center for the Arts: TechnoCRAFT: Hackers, Modders, Fabbers, Tweakers and Design in the Age of Individuality; URL: www.ybca.org, July 2010*

*Franz Liebl*

Franz Liebl (*1960), Dipl.-Kfm., Dr. oec. publ., Dr. rer. pol. habil., has been professor of Strategic Marketing at the Berlin University of the Arts since 2005. From 1986 to 1994 he worked with the Institute for Systems Research (University of Munich) and was its vice-director from 1990 to 1994. In 1994 he became professor of Business Administration at Witten/Herdecke University, where he held the Chair of General and Quantitative Management until 1998, and the Aral Chair of Strategic Marketing until 2005. His research interests include strategy development, strategic issue management, business design and marketing in a context of individualised societies. Since 1983 he has published numerous articles on youth culture, subculture and experimental music. Since 1982 he has participated in many mail-art and mail-music projects. He is editor of two series of books ‹Cognitive Strategy Concepts› and ‹Experience-based Lifeworlds›. His latest books include ‹Cultural Hacking: Kunst des Strategischen Handelns› (Springer, Vienna/NewYork) and ‹New-School Strategy› (forthcoming).



Björn Franke Royal College of Art, bjorn.franke@rca.ac.uk

# Design Fiction is Not Necessarily About the Future

Keywords: Design Theory, Aesthetics, Fiction, Philosophy, Epistemology

Discussions about fictional approaches in design are often centred on the Future or the New. These discussions mainly treat *fiction* in design as *science fiction* or *future speculation* within the context of technological products. Since designing, however, is always a projection into the future and since the outcome of the design activity is most likely something new, it is justified to ask if this discussion of fiction in design tells us something new or if we are only dealing with new labels for something that design has always been about. Another way to think about fictional design has been described as *value fiction*, which aims to investigate alternative uses of products and technology, which are less situated in the future but in an alternative present. If realised in terms of prototypes these design objects could be understood as heterotopian objects or *real fictions*. In this paper I would therefore like to suggest a different way of thinking about *design fiction*. Fictional design should rather be understood in the sense of poetic design, which aims to explore possibilities of human existence in relation to artefacts without being exploited for future speculation or future studies. In understanding fictional design as poetic design, we may also think of design as a form of philosophical inquiry.

Design is an activity that is fundamentally concerned with something that does not, but could exist. It is an inventive activity, which deals with imagining alternative worlds rather than investigating the existing one. Therefore, it is concerned with the possible rather than the real. The investigation of the real and the possible are fundamentally different activities of inquiry, a distinction famously been by Aristotle. He distinguishes between the historian, who is concerned with what has happened (the real and particular) and the poet, who is concerned with what could happen (the possible and universal). Because it deals with universals, for Aristotle, poetry is an activity similar to philosophy.[1] The distinction between the possible and the real, or fiction and reality, is one of the most common ways to classify something as fictional. Common design activity is not only concerned with possibilities but also with realising these possibilities. In other words, it is concerned with making the possible real. Design as a fictional activity would therefore need to remain in the realm of the possible without entering the realm of the real (although it can, of course, influence the realm of the real as fictional literature does). Following Aristotle, fictional design objects, would be concerned with universals rather than particulars, such as general problems of the human condition or the human relationship with artefacts. Fictional design could be understood as poetic design and thereby taking the form of a philosophical inquiry. The value of fictional design objects would be their poetic quality and their quality of enhancing our understanding of human existence in a material world.

Fiction in design, however, has often been understood as projecting the future. Possibility is thereby understood in terms of temporality and is equated with the future, or rather futures. In this sense, design is understood as an activity that deals with fiction in terms of envisioning possible futures and the things to come. The fictional design object, understood in this sense, is the thing to come in form of models and prototypes. These objects, however, are very different from poetic possibilities. They often lack the critical and aesthetic distance of fiction since they are often understood not as fictional or poetic explorations of human possibilities but as proposals for the future. They are not possibilities but proposals and are therefore perceived as real rather than fictional. They can probably be better described as visionary design objects, such as concept cars, automatic home appliances, or alternative furniture landscapes. They are promoting particular ways of living rather than investigating or questioning it the present one.

Visionary design objects are portrayed as desirable and mask out ethical and social consequences of their existence. After all, these projects are about selling rather than investigating. They are bland propositions of things to come, promoting the propositions as desirable, but they are not poetic design objects, through which the audience can realise the impact, these things may have on their lives. These design objects are promotional rather than reflective media

and the fictional element seems to be reduced the future and the new. The visionary design object is about itself, whereas the fictional or poetic design object is only a medium for articulating a possible world. Fictional or poetic design objects are reflective media, in which social conditions are articulated, rather than models or prototypes for possible futures.

The fictional element in design has thus been described very differently. Bruce Sterling, for example, understands fictional design as forward thinking design. Although, he opposes design fiction to science fiction, he involuntarily aligns it again with science fiction since he excludes understandings of fiction, which are not future-directed.[2] Julian Bleecher on the other hand aligns design fiction with science fiction and future speculation in a straight forwards sense. For him design fiction is speculation about the future, or futures, through models and prototypes.[3] Both conceptions of fictional design exclude possible understandings, which are not future-directed, since they use the term fiction equivalent to future. Design fiction could therefore also be called design future. The future, however, is something that design has always been about, or as Victor Margolin has said, «As creators of models, prototypes and propositions, designers occupy a dialectic space between the world that is and the world that could be.»[4]

Another way to think about design fiction could be to distinguish between real and non-real objects. Anthony Dunne, for example, has opposed conceptional design to commercial design, the former being fictional, the later being real. The fictional design object is thereby understood as a design object, which is not commercial or mass-produced and therefore non-real. What he calls *real fiction*, however, is a space between the real and the fictional, in which alternative uses and conceptual products can be articulated outside the marketplace.[5] He has also used the term *value fiction*, which refers to design as a form of cultural thought experimentation. Value fiction is thereby understood in opposition to science fiction, the later being a way of imagining impossible technologies in traditional cultural settings, the former being a way of imagining alternative uses for existing technologies and thereby different cultural values. The aim of value fiction is thereby to encourage the audience to question the mechanisms, which define design objects as fictional or unreal.[6]

Most of these conceptions of fictional design, however, do not seem to investigate what the fictional quality of design might be. They either use fiction in opposition to reality or use fiction equivalent to future. In my opinion, only the concept of value fiction may open a space for fictional design as inquiry. In the following, I will investigate fictional design in terms or poetic fiction, which is an explorative design activity and should be understood as an inquiry in its own right. Fictional design should therefore not be exploited as a tool of future speculation or future studies but should be understood as a poetic and therefore philosophical inquiry.

## Reality, Possibility and Fiction

In order to understand fictional design we first need to have a better understanding what fiction actually is. Fiction can be understood as something being fictitious or fictional. Fictitious refers to something, which is not true. It does not necessarily aim to deceive but to play with our perception of truth. To characterise something as fictitious has a negative connotation. It is revealed in hindsight and is a judgement about our knowledge of something. To characterise something as fictional, on the other hand, has a positive connotation, as it is to accept its fictional status from the outset.[7] Therefore, the fictional status of a work cannot lie within the process of its reception but has to be determined in the process of its making. This act of fiction making is an intentional act, which does not have deceptive but fictional intentions.[8]

Fiction is not only in design understood in opposition to reality. Reality, however, can only be understood if the real is separated from something non-real, as the term real would otherwise be meaningless. But whereas the separation from the non-real defines the real, the separation from the real does not necessarily define the fictional.

If we understand reality as the physical and material world, we understand the real in terms of materialism, and in this sense we think of reality in terms of materiality.[9] Following this understanding, fictional entities are non-physical entities and therefore non-real entities, such as characters in a novel. The character is not real and therefore fictional since he does not exist physically. This understanding of fiction, however, is problematic for two respects. First, the fictional character is somehow physical, since he exists in the physical world; in form of a text or in the mind of the reader, which are both physical objects. This definition of fiction is also problematic, since a fictional character cannot only exist in a novel, but also in form of a sculpture, in a film or enacted on stage. Sure, the objects are only vehicles for the character but they are clearly physical. Second, this understanding of fiction is not helpful to understand fiction in design, since design objects are almost by definition material objects. Of course one could doubt that there is a ‹real world› and that the actual world is a fictional world created through fictional objects – not only in the arts but also in the sciences and philosophy. Immanuel Kant has introduced the term *heuristic fiction* in order to describe the abstract concepts of the mind, which do not have any relation to direct experience. For Kant the mind develops these fictional concepts in order to think rationally. These fictional objects have therefore a productive role in the thought process.[10] For Hans Vahinger these productive fictional objects are understood *as if* the were real. Particularly in scientific inquiries, fictional objects should be understood as provisional and useful qualities. They do not have relevance for reality, but in their transitional function, fiction allows something to be realised or to happen, which would not be possible without.[11]

It is through these fictionalising acts, through which worlds are created. As Nelson Goodman has observed, we do not live in a single and coherent world, but in many different worlds. We can therefore not really speak of the real world since there are many real, actual or parallel worlds. No world, however, exists as a self-contained entity since worlds are created out of other worlds. For Godmann, worldmaking is remaking existing worlds through strategies such as composition and decomposition, weighting, ordering, deletion and supplementation or deformation of certain elements of these worlds. The description of a world is always dependent on the frame of reference for the particular world. It is not possible to describe a world without any frame of reference, as it is trough through this frame, by which the world in question is accepted as an actual world. Therefore different worlds can exist as actual worlds for different people with different frameworks of reference.[12]

*The physicist takes his world as the real one, attributing the deletions, additions, irregularities, emphases of other versions to the imperfections of perception, to the urgencies of practice, or to poetic license. The phenomenalist regards the perceptual world as fundamental, and excisions, abstractions, simplifications, and distortions of other versions as resulting from scientific or practical or artistic concern. For the man-in-the-street, most versions from science, art and perception depart in some ways from the familiar serviceable world he has jerry-built from fragments of scientific and artistic tradition and from his own struggle for survival. This world, indeed, is the one most often taken as real; for reality in a world, like realism in a picture, is largely a matter of habit.*[13]

Reality becomes relative, as a world that seems fictional in one framework might seem perfectly real in another. These worlds, however, are not necessarily based on personal preferences, but are worlds for different purposes. To combine everything into single frameworks of reference seems impossible, or as Goodman writes, «we do not welcome molecules or concreta as elements of our everyday world, or combine tomatoes and triangles and typewriters and tyrants and tornados into a single kind.»[14]
In his analysis of worldmaking, Goodman does not distinguish between the real and the non-real but between the actual and the possible. Possible worlds created in fiction are routed in actual worlds, to which they refer back. What might seem fictional at first may eventually become actual as it has been the case with many scientific inventions such as ‹vitamins,› ‹bacteria,› or ‹radiation.› In this sense fictional or possible worlds can become actual worlds.[15]
The possible however should not be understood as something that precedes the real. As Henri Bergson has observed, something real only seem to have been possible retrospectively when it has become real. In this sense it is a fallacy to think that it is possible to conceive something as possible beforehand, as it only becomes having been possible once it is realised. For Bergson it is an illusion to think of the reality of tomorrow as already being contained in the actual present. It is only tomorrow, when tomorrow's reality seems to have been contained in today's reality.[16] According to Bergson, it is the artist who is creating both the possible and the real when realising a work and thereby a world. It is through the creation of this world that the real makes itself possible rather than the possible making itself real.[17] In this sense, Bergson argues against determinism and the unfolding of a pre-defined plan. Thereby he points to the possibility to create something, which does not seem to be possible.
Another way to think about fiction is in terms of what Niklas Luhmann has called *doubling reality*. Fictional realities are not unreal since they exist in some way. To understand these fictional realities as doubled reality allows distinguishing between the ‹real reality› and realities of other kinds, such as the apparent realities of fictional literature. Fictional or apparent realities are realities besides the real reality.[18] As Hans Blumenberg has observed literary fiction is not fictionalised reality but fictionalised reality of realities. Literary fiction creates conditions, which normally cannot be observed in reality; that is, they create conditions, in which something seems to be realistic. But in order to be realistic literary fiction cannot be real.[19] Fiction serves as a mirror to see the world and ourselves from a different and distanced perspective.[20]
Besides the opposition of the real and the fictional Wolfgang Iser introduces a triadic relationship between the *real*, the *fictional* and the *imaginary*. In this model the fictional is realised in a fictionalising act, through which the real can become irrational or the imaginary real. The fictional can be understood as a transitional space or as a transitional object between the real and the imaginary, which only exists to allow transitions between these realms.[21] In this system the real refers to the world outside the fictional work, which is basis and reference for the work. The fictional is understood as an intentional act of creating the fictional in order to distinguish it from the fictional in the sense of non-real, lie, or deception. The imaginary is understood as an abstract and neutral entity, which should not be confused with imagination or phantasm.[22]
Whereas artistic fiction, such as literary fiction, shows itself as fictional, fiction, which is embedded in our understanding of reality, such as epistemic, heuristic, or social fiction, normally conceals its fictionality. Fiction that does not disclose its fictionality, however, does not necessarily aim to deceive, but needs to appear as non-fictional in order to fulfil its function. It therefore becomes reality.[23] The fictional world is a world but into brackets, which we understand as if it were a real world. The fictional world is not an empty play of imagination, but it is a world, which serves a practical purpose of describing an imaginary case.[24]

## Strategies for Fictional Design

Most works, which are described as fiction, are linguistic works, such as literature or film. Language seems to be the medium, in which fictional worlds can be created in form of a narrative. Design objects on the other hand are usually understood as objects belonging to the actual world rather than a possible or alternative world. They are present as material objects in the actual world and their presence is often amplified through their functionality. Design objects can be used in the actual world and therefore we experience design objects mainly as actual objects rather than as possible objects.
As we have seen in the analysis of fiction, the fictional status of a work or objects is created through a fictional intention. In this sense a fictional design objects needs to be presented as a possible objects rather than an actual object. The fictional design object, however, presents itself as if it were a real object in order to create a fictional reality. These fictional realities can be described as: (1) alternative or doubled realities, which, in spatial terms, have been described by Michel Foucault as heterotopias[25]; (2) possible realities, not in terms of a temporal possibility but in terms of the universal possibility; (3) a meeting ground, following Iser's triadic model, where the real and the imaginary meet and alternative realities are negotiated; (4) as a strategy to bracket the world in order to serve as a mirror for realising something about the actual world.
An object, which is merely ‹not real› or ‹not real yet,› is therefore not necessarily and fictional design object. The fictional design objects needs to create an alternative or possible world, which appears as if it were a real world. Fictional design can achieve this in two ways. First, design objects can be used to *present* a fictional world, in which they are used as props in order to render the alternative world as believable. This fictional word and the embedded artefacts appears as if they were real and the audience can judge the quality and implications of the propositions put forward in this world. Second, design objects can be used to *imagine* a fictional world, that is, the fictional world is

imagined or enacted by the audience. Design objects are used as catalysts for, or as gateways into the alternative world by showing, for example, uncommon uses or by embodying alien values.

## Presenting Fictional Worlds

Design objects, which show fictional worlds, are often embedded in other media, such as film or photography. These media support the creation of alternative worlds as they allow creating a narrative, through which fictional design objects are rendered believable in their use or cultural implications. Fictional design that is following this strategy, presents a predefined narrative or perspective, which can be judged by the audience in terms of their functional, social or ethical quality.

An example to illustrate this strategy is my project *Traces of an Imaginary Affair*, which is a collection of nine tools that allow the user to create marks of sexual activity on his body. These tools can be used to leave marks, such as bite marks, carpet burns, bondage marks, love bites, scratches and bruises. In addition, probes of perfume, lipstick and hair can be applied to either the body or clothes. The design object acts as fictional props to think about moral behaviour in relationships, such as intentionally instigated jealousy. In this possible world the protagonists use these tools to simulate sexual marks of an affair. The clear aim of this activity is left open, but the audience can imagine the potential consequences of these uses and reflect on the moral and social implications. The design object not only presents the possible world as a closed entity but also allows the audience to imagine to be part of the world and use the objects themselves. The audience can thereby gain a perspective on the issues at stake, for example, the relationship to one's own partner. The object furthermore occupies an ambiguous space since the tools are functional and could be used.

This design object has a clear resemblance to the actual world and almost is an object of the real world. Fictional design, however, can also create worlds, which are more imaginary. A classical example for this strategy is Superstudio's project *Supersurface* as part of their *Fundamental Acts* series. A ‹magic surface› covering the entire planet is presented, which renders all material objects superfluous. It functions like a ‹material virtual reality,› which instantly materialises wherever the person needs at any location on the surface. This fictional world is interesting because spaces are created, in which the protagonists of the world can pursue ‹useless› activities such as cleaning up or doing the laundry. Through this twist, the project does not portray a visionary scenario of a perfect future but a narrative, in which the human condition and the longing for a ‹simpler life› and ‹irrational activities› is revealed. The audience need to be able to relate to this possible world and their characters in the same way as they can relate to a fictional world presented in a novel or film. The presented world needs to be sufficiently defined in order to be understood as if it were a real world; but it also needs to be open enough to allow an imaginative inhabitation by the audience. It is therefore not enough to portray a novel technology and potential uses, but fictional design needs to create worlds, into which the audience can immerse themselves. Design objects could otherwise be misinterpreted as product proposals and visionary design objects and thereby loosing their fictional quality.



The possible world can show moral and social dilemmas, tragedies or comedies and the design objects are the media, through which these narratives are articulated. Fictional design objects do not only present themselves, they also represent issues of the possible world. They are not only objects-in-the-world but also objects-about-the-world.[26] They refer to the fictional worlds, to which they belong, but they also refer back to the actual world, in which they exist as a material objects. This gives fictional design objects and ambiguous character.

## Imagining Fictional Worlds

Another direction for fictional design is to create design objects that provoke the creation of a fictional world through imagination by the audience. In this sense the fictional design object acts as a catalyst and opens a fictional world rather than presenting one. The aim is to open a space, in which the audience can imagine possible worlds including the actions, uses and values that these worlds involve. The audience thereby becomes co-producer of the possible world.

An example that illustrates this strategy is Anthony Dunne's and Fiona Raby's project *Park Interactives*, which is a collection of adult furniture for the Medici Gardens in Rome. The furniture is very abstract, but suggests sexual misbehaviour in the garden. The artefacts stimulate the audience to imagine the possible acts of sexual misbehaviour and the resulting consequences and implications for a society, which allows such activities to take place in public spaces. Even though the design objects are functional furniture-like objects, they act as fictional props to think about sexual conventions and moral values in society.

This approach, however, should not be confused with conceiving design as a ‹vehicular medium,› through which the ideas are presented in such a way that the audience can agree or disagree with the presented scenario. Rather, the issues are presented in such a way that the audience has to form their own views and judgement by decrypting the potential world that these artefacts suggest. The key difference is to exploit the ambiguous status of the objects, instead of showing clear-cut statements, and thereby forcing the audience to form their own judgements.

Another example, which forces the audience to imagine a possible world and their implications, is Hans Hollein's project *Architekturpille (Non-Physical Environment)*. The pill, probably containing a psychotropic substance, suggests that through the use of the pill an architectural environment is created. The audience is asked to imagine taking the pill and to picture the world, which would subsequently be experienced, as an architectural environment. The designer of the pill becomes the architect of the non-physical environment, which the user of the pill would enter. The pill as a fictional design object is a medium, through which we can think about what architecture is and what we consider as architecture.

## Fictional Design as Inquiry

Fictional design either presents possible worlds by showing a world, in which fictional design objects serve as props, or it presents fictional design objects, which allow the audience to imagine a possible world. The possible worlds,

which are created, are not only entertaining but also allow the audience to widen their intellectual disposition. Fictional design creates possible worlds, which are based on the interaction with artefacts. Through this imagined interaction the audience can judge the social, political or ethical quality of the particular world. This is true for both imagining possible worlds based on design objects and perceiving possible world presented through design objects. By imagining a possible world we also imagine how the design objects may be used and what kind of social implications they may have. Thereby we make moral and ethical judgements about these objects and the world, to which they give rise. By imagining a world we also imagine experiencing this world emotionally. Thereby we can judge the quality of the world based on the quality of our emotional response to it.[27] By imagining a world, we mentally create and inhabit it. Imagining this world is a kind of thought experiment, in which we ask, what kind of world would arise from the fictional design object and what the personal, social or political consequences and implications would have. In this sense the design object is the catalyst for the thought experiment, both for the designer and for the audience. By imagining to interact with the fictional design objects we imagine a possible world, in which the interaction with these object is possible. Since the design object is the catalyst for the possible world it appears as an object from a different world sitting in the actual world. It is precisely this ambiguity of the material existence of the possible in the actual, which defines the fictional design object.

Fictional design can also present a possible world together with the social and ethical conditions, which are caused by the design objects populating this world. Similar to fictional literature the audience imagines inhibiting this world and thereby interacting with the presented design objects either directly or through the protagonists of the possible world. The designer of the fictional world uses design objects and their embodied values to construct the world. Since every design object embodies ideas and values, the difference to fictional design is that the designer of a fictional object uses the embodied values in order to create a certain social situation in the fictional world. The possible world shows alternative forms of existence and experience. By reflecting on these issues the audience gains an understanding of the moral an ethical conditions of the possible existence. Particularly through fictional situations, which are existential, tragic, and upsetting we can gain ethical and moral knowledge.[28] Fictional worlds may also challenge and even subvert our moral concepts and values. Thereby social, economic, ecological, intellectual, architectural, religious and moral values as well as scientific and technological limitations are open for exploration and reassessment. The aim thereby is not necessary to shock but to provide the audience with alternatives to think about the social conditions of the actual world. Fictional worlds are not self-contained, but also contain features of the actual world, which may have existed unnoticed in the real world. Fictional worlds make the audience look anew at certain situations and may lead to the reconsideration of moral concepts. In this sense the fictional world can be understood as an inquiry into alternative value systems both for the creator of these worlds and their audience. The fictional world can act as laboratory to explore these values in a way that would not be possible in the actual world.[29]

The fictional world serves as a mirror for the present condition of the actual world. In this sense, not the fictional condition is challenging, but the fictional condition is challenging the actual world. Fictional design objects are therefore media for inquiry into the conditions of possible forms of human existence, whether social, moral or technological. Fictional worlds produced through design objects can be understood as thought experiments, which place the process of argument and analysis into the mind of the audience, rather than presenting arguments and conclusions to the audience.[30]

## Conclusion

Fictional design objects are different from other fictional objects. They are objects of a possible world, which exist as material entities in the actual world. Although they are fictional objects they inhibit and ambiguous space between reality and fiction. They are hybrids, which infiltrate the actual world and thereby open a door to a possible world. Fictional design can use objects in two ways: as objects, which render a possible world believable or as objects, which open a space for imagining possible worlds.

Fictional design can be a form of philosophical inquiry into moral values and forms of existence and interaction. By rendering alternatives to the present world possible, they question our current material landscape and the values, which our artefacts embody. It can also open a space in, which alternative forms of existence, values, or political systems can be negotiated through fictional design objects. The fictional space, however, is different to the fictional world of, for example, literature since the world of fictional design objects is the actual world. They blur the boundaries between the actual and the possible and can create a space for negotiating the imaginary. Design objects are particularly useful for this negotiation, since they immediately relate to the actual world and are understood in terms of use. They relate to the comedies and tragedies of everyday live.

## References


1 Aristotle, Poetics, sec. 9.

2 Bruce Sterling, «Design Fiction,» http://interactions.acm.org/content/?p=1244 (accessed March 20, 2010).

3 Julian Bleecker, Design Fiction: A Short Essay on Design, Science, Fact and Fiction (Near Future Laboratory, 2009).

4 Victor Margolin, «Design, the Future and the Human Spirit,» Design Issues 23, no. 3 (2007): 4-15.

5 Anthony Dunne, Hertzian Tales: Electronic Products, Aesthetic Experience and Critical Design (London: RCA Computer Related Design Research, 1999), 68.

6 Anthony Dunne and William H. Gaver, «The Pillow: Artist-Designers in the Digital Age,» CHI '97 (1997): 361-362; Anthony Dunne and Fiona Raby, Design Noir: The Secret Life of Electronic Objects (Basel, Boston, Berlin: Birkhäuser, 2001), 63.

7 Heinz Schlaffer, Poesie und Wissen: Die Entstehung des ästhetischen Bewusstseins und der philologischen Erkenntnis (Frankfurt am Main: Suhrkamp, 2005), 145.

8 Gregory Currie, The Nature of Fiction (Cambridge: Cambridge University Press, 1990), 11.

9 David Novitz, Knowledge, Fiction and Imagination (Philadelphia: Temple University Press, 1987), 123.

10 Immanuel Kant, Kritik der reinen Vernunft (Stuttgart: Reclam, 1986), sec. 2.1.3.

11 Hans Vaihinger, Die Philosophie des Als Ob: System der theoretischen, praktischen und religiösen Fiktionen der Menschheit auf Grund eines idealistischen Positivismus (Hamburg: Meiner, 1920).

12 Nelson Goodman, Ways of Worldmaking (Indianapolis: Hackett, 1978), 1-17.

13 Ibid., 20.

14 Ibid., 21.

15 Ibid., 103-104.

16 Henri Bergson, «The Possible and the Real,» in The Creative Mind: An Introduction to Metaphysics (New York: Citadel Press, 1992), 99-101.

17 Ibid., 103-104.

18 Elena Esposito, Die Fiktion der wahrscheinlichen Realität (Frankfurt am Main: Suhrkamp, 2007), 7-8; for the term «doubled reality» cf. Niklas Luhmann, Die Religion der Gesellschaft (Frankfurt am Main: Suhrkamp, 2000), 58-60.

19 Esposito, Die Fiktion der wahrscheinlichen Realität, 17; cf. Hans Blumenberg, «Wirklichkeitsbegriff und Möglichkeit des Romans,» in Nachahmung und Illusion, ed. Hans Robert Jauss, (München: Wilhelm Fink, 1969), 27.

20 Esposito, Die Fiktion der wahrscheinlichen Realität, 84.

21 Wolfgang Iser, Das Fiktive und das Imaginäre: Perspektiven einer literarischen Anthropologie (Frankfurt am Main: Suhrkamp, 1991), 23, 49-50.

22 Ibid., 20nn2-4.

23 Ibid., 36.

24 Ibid., 37-40; cf. Vaihinger, Die Philosophie des Als Ob, 589.

25 Michel Foucault, «Of Other Spaces,» in The Visual Culture Reader, ed. Nicholas Mirzoeff, (London: Routledge, 2002).

26 Cf. Dorothy Walsh, Literature and Knowledge (Middletown, CT: Wesleyan University Press, 1969), 55.

27 Cf. Gregory Currie, «Realism of Character and the Value of Fiction,» in Aesthetics and Ethics: Essays At the Intersection, ed. Jerrold Levinson, (Cambridge: Cambridge University Press, 1998), 167.

28 Cf. Sabine A. Döring, Ästhetische Erfahrung als Erkenntnis des Ethischen: Die Kunsttheorie Robert Musils und die analytische Philosophie (Paderborn: Mentis, 1999), 56.

29 Novitz, Knowledge, Fiction and Imagination, 137-141; cf. Noël Carroll, «Art and the Moal Realm,» in The Blackwell Guide to Aesthetics, ed. Peter Kivy, (Malden, MA, Oxford and Carlton, Vict.: Blackwell, 2004), 131.

30 Cf. Ibid., 137.

Russell Loveridge lapa - laboratoire

de la production d'architecture - EPFL, russell.loveridge@epfl.ch

# Fantastic Form

Keywords: Speculative design, production, fabrication, film, science fiction, architecture, philosophy, literature

Design and architecture has always been used within film to engage the fantasy of the viewer. By providing both a sense of the familiar and by communicating complex information about context, architecture and design enhance the believability of place and substance, and in turn this creates the stable foundation for ‹the fantastic› to emerge.
Technologies employed in the film industry enable story tellers and film makers to set their scenes in convincing yet fictional environments. This longstanding symbiotic relationship between architecture, design, and film is increasingly being enhanced (or even supplanted) with the use of digital visual effects. As a parallel yet associated development, computer aided design and visualization technology gives designers and architects the enhanced ability to create their own design fictions: Photorealistic designs, existing only in digital space, that are not encumbered by the limitations of real world constraints. Yet, just as with digital movie effects, the craft of design risks credibility when it is too heavily invested in appearance rather than substance.
The origin investigation in this project was an invitation from the Centre d'Art Neuchâtel (CAN) and the Neuchâtel International Fantastic Film Festival (NIFFF) to collaborate on a small and temporary architectural project to be installed at the *fantastic film festival*. The architectural brief was the starting point for this design-build project, but it was the notion of ‹the fantastic› and its relation to both the issues of fiction and design which became the driving interest of research.



Figure 1→**VI**
Digital rendering of the proposed ‹Fantastic Form› on site in Neuchâtel.



Fine art, music, performance, film, and design all have the ability to engage and interact with an audience. Each art form can engage the senses both spatially, and temporally; whether it is the different perspectives of an art piece, the changing tone, volume, and rhythm of playing music, or the progressing plot, visuals and actions within a film; the audience relates to art in both a sensorial and intellectual manner.
Architecture and design is no different. The perception of a design should change with response to position and perspective, light, context and conditions. Good architectural design engages both the senses and the mind of its audience and a designer should dynamically anticipate its users perception of the project.
Much has been written about the relation between film and architecture, and the purpose of this paper is not to repeat this discourse[1], however it is important to reiterate that architecture and cinema have always enjoyed a symbiotic relationship[2]: Architecture provides comprehensive visual context to aid storytellers, and film is a dynamic medium for broadcast of new ideas, styles, and understanding of architecture and design.[3]

1 For a general introduction refer to Architecture And Film: Experiential Realities And Dystopic Futures, Prof. T.M. Boake

2 Indeed, the topic of the first public film showings were scenes of architecture and place, such as «La Sortie des Usines Lumière» or «L'arrivée d'un train en gare de La Ciotat», by Louis and Auguste Lumière.

3 Ref: Tschumi, B. (1996) and Penz, F. (1997).

## The Fantastic

As a word, *fantastic* is enigmatic; it is used regularly in everyday language to mean ‹great› or ‹superb› but this use is colloquial. A precise definition conforming to its root of ‹phantasticus› (*imaginary* in Greek) is more in keeping with our interests, but is challenging to specify.
For the purposes of this research we began with the fantastic as it relates to the NIFFF film festival: the genre of *speculative fiction*. The fantastic in this sense encompasses various imaginative fiction genres, including fantasy, horror, science fiction, and supernatural fiction. However, in order to prevent a simplistic analogical translation of film imagery into a design, a more comprehensive definition for the concept was required.
For our purposes the idea of ‹fantastic› best correlates to the work of literary theorist Tzvetan Todorov, where ‹the fantastic› is described as being a state of reality, though one where there is a degree of confusion within the viewer, such that they fundamentally question the phenomena which they are experiencing.[4]

*«The fantastic requires the fulfillment of three conditions. First, the text must oblige the reader to consider the world of characters as a world of living persons and to hesitate between a natural and supernatural explanation of the events described. Second, this hesitation may also be experienced by a character, thus the reader's role is so to speak entrusted to a character… Third, the reader must adopt a certain attitude with regard to the text: he will reject allegorical as well as poetic interpretations.»*[5]

This final condition, the ‹suspension of disbelief› relates to the credibility of the delivery medium, not the contents. Suspension of disbelief as a concept is a *quid pro quo*: the audience tacitly agrees to temporarily suspend their judgment in exchange for the promise of entertainment.
If we accept Todorov's definition as our basis, then a fantastic work must be subtle enough to ‹fit› in both the world of the story and still meet the expectations of the reader. The fantastic leaves an underlying questioning as to whether their interpretation of the work was authentic or whether there were unnatural powers at work. It is within this dichotomy that we find the limitation of the concept, that the fantastic must be a temporary state.

*«The person who experiences the fantastic must opt for one of two possible solutions: either he is the victim of an illusion of the senses, or a product of the imagination – and the laws of the world then remain what they are; or else the event has indeed taken place, it is an integral part of reality – but then this reality is controlled by laws unknown to us. …The fantastic occupies the duration of this uncertainty. Once we choose one answer or the other, we leave the fantastic for neighbouring genres, the uncanny or the marvellous. The fantastic is the hesitation experienced by a person who knows only the laws of nature, confronting an apparently supernatural event.»*[6]

4 Although credited to Todorov here, the concept of ‹ambiguity› is originally credited to Peter Penzoldt, in his doctoral thesis entitled The Supernatural in Fiction (1949).

5 Todorov, T (1975): pp. 33.

6 Ibid, pp. 25



*The uncanny* is the realm of the real, where confusion has been invoked by illusion or misinterpretation on the part of the viewer. *The marvellous* is about comprehension (or perhaps a preconception) of the laws of reality, and the scene can be explained once those laws are appropriately adjusted. The irony of this is that the fantastic exists only in the case that the participant cannot choose one or the other of these possibilities.
The fantastic is therefore an unstable state, dependant upon the ability for further investigation and understanding by the participant. In the case of literature, the perspective and understanding of the participant (reader) is constrained within the storyline and text as laid out by the author. In this way ‹the fantastic› aligns itself with the McLuhan-ian doctrine «The medium is the message»[7]. There is an inferred understanding that the design is not strictly the creation of content, but that the design includes the control of the ‹staging› and thusly the perception of the content.

### The medium and innovation

If the fantastic is defined as a curiosity and an invitation for investigation, then it is logical for us to first look at film as an investigative medium. The basic parameters of film are framing of the scene, image quality, lighting quality, and the progression of content from one frame to the next. The progressive variation of images over time creates the illusion of movement. However if inverted the discreet analysis of individual frames allows for stop motion understanding of movement and time.
Étienne-Jules Marey is widely considered to be a pioneer of photography and an influential pioneer in the history of cinema. His work in understanding the physiology of movement through the use of his ‹chronophotography› camera is considered key in the use of film as an analytical tool. In the 1880's Marey, then a scientist studying cardiology, heart beating, and muscles became fascinated with the understanding of movement.
Influenced by Eadweard Muybridges work, Marey's revolutionary invention was to record multiple images of movement on a single photographic plate. His invention first visualized the rotational geometry and patterns of movement of animals, insects, and most famously of a man walking (see Fig. 2). The geometric patterns registered using his *chronophotography* camera clearly show the cyclical wave motion of natural movement, and in 1894 Marey published the book *Le Mouvement*.



Figure 2→**VI**
Stop motion analysis of a walking man,
Étienne-Jules Marey, from Le Mouvement 1894.

The intersection of creativity, art, science, and the development of technology is the basis of innovation. Just as developments in science and technology can bring new possibilities for design it is important for designers to comprehend that the converse is equally true.[8]

7 Ref: Marshall McLuhan: http://en.wikipedia.org/wiki/The_medium_is_the_message (accessed 09.06.2010)

8 For example ref: Geraghty, L, ed. (2008). The Influence of Star Trek on Television, Film and Culture. Jefferson NC.

## Design Fiction

Design is both a creative and intellectual investment into the existence of a construct or object. Proficient design not only addresses functional and aesthetic characteristics for an object, but should embody an ambition to materialize new concepts and to challenge current solutions to similar problems. As a basis for development, designers use different forms of representation or prototyping as the primary means of investigation.

The concept of ‹design fiction› needs to be distinguished from prototyping. Whereas prototypes are a representation responding to the requirements and associated constraints of the ‹real› world, design fiction is of design without a predetermined ‹factual› basis for completion of the object.

For a work of design fiction to be accepted and appreciated as something more than fanciful design musing it still needs to project a sense of credibility. In this sense design fiction also requires a coherence to laws of the world in which the design resides and an appropriate *suspension of disbelief* on the part of the viewer. Design fiction, in this way, relates to our definition of ‹the fantastic› and the eventual interpretation of the design's reality. However in this sense the re-interpretation of reality most often refers not to acceptance of magic or the supernatural, but more pragmatically to the advancements of science and technology.

From the beginning of film, architecture and design have been employed to set fictional contexts with a combination of optical and physical effects. Digital visualization tools now account for much of this craft and as the technology evolves complex, robust, and automatic software tools are being developed to create scenes that approach photorealism.[9]

## Believable but not real

By using computational tools, effects artists have been greatly relieved of the minutiae tasks of creating the complexity of detail, managing lighting and colour correction, scene progression, and the creation of other effects. Yet, just as with a multitude of Hollywood ‹FX› movies, digital design risks credibility when it is too heavily invested in appearance and technology rather than substance. Programming (as opposed to manual artistry) now accounts for much of the ‹lifelike› content, but care is required to ensure the digital effects overcome the ‹uncanny valley›.

The *uncanny valley* is a hypothesis originally developed by roboticist Masahiro Mori regarding the field of robotics, but has been expanded to cover other fields of artificial re-representation. His hypothesis states that as a crude representation of a natural entity is improved, the graphed emotional response rises slowly in the positive until a point, beyond which the response quickly drops to becomes strong revulsion (the valley of the graph). This reaction point is theorised to be due to the psychological and intuitive detection of both deception and imperfection. However, as more realistic cues are increasingly added to the representation and as it becomes less distinguishable from reality, the emotional response once again becomes positive and approach high levels of empathy.[10] With this knowledge, artists can use many different ‹tricks› of the media (including complex digital manipulations of a scene) to mediate the viewers perception.

9 Ref: Stephen Prince (2004).

10 Ref: Mori, M (1970).



At a functional level, digital generation and manipulation tools often use the concept of «difference in repetition»[11]. In scenes where there are many similar entities, programmed variability ensures degrees of difference between objects, emulating randomness, biological mutation, and texture which are all expected in nature. Examples are the use of fractal algorithms for vegetation, automatic city generators[12], or the MASSIVE software used to create agent or swarm driven crowds.[13] These programmed methods rely on cyclical algorithmic processing (looping) which is a pervasive structure in programming, and is efficient for generating complexity.

Designers, like their counterparts in digital effects, are progressively using programmed control of computer aided design (CAD) software to develop complexity in their work. CAD programming enables designers to create design variation at different scales quickly and progressively. Speed in the generation of design versions can be highly constructive for design development, while the looping code can also be developed to assist with the analysis and refinement of design.[14] High quality fantastic visualizations are thusly no longer the only output from the process of design. Scripted code segments and design functions which define geometric operations and parametric relations are also a secondary product.

# Architecture and fantastic films

If we are to follow Todorov's definition of the fantastic, then the issue of ‹believability› becomes all the more important within the context of ‹fantastic› films. In speculative fiction, the engagement of the audience is achieved not by creating a seemingly ‹natural› context, but by ensuring that the context is ‹normal enough› that the viewer is willing to suspend their disbelief.

*«The identifying traits of fantasy are the inclusion of fantastic elements in a self-coherent (internally consistent) setting, Within such a structure, the fantastical element is possible however they require adherence to an internal and stated logic; any events in the story are impossible, but follow ‹laws› that are internally consistent.»*[15]

Of the subgenres of speculative fiction (fantasy, horror, science fiction, and supernatural fiction), it is science fiction (with its immediate relation to both design and technology) which proved the most appropriate genre for focus in our investigation. For Todorov, science-fiction is a species of the *marvellous* in that although it is based on alternative scientific or technological realities, it has a set of consistent laws governing the possibilities within its world. Just as with design fictions, the viewer finds credibility in the fact that although impossible to us now, evolution of technology may render such things possible in the future.

11 Here we could be easily sidetracked with the theories of «Difference and Repetition» by Gilles Deleuze, but in a practical sense we can acknowledge that we are agreeing with the concept of complex repetition.

12 Commonly used for video games, but this research field is also prominent in GIS and urban planning simulation tools.

13 Originally developed by WETA: http://www.massivesoftware.com/

14 Ref: Sharples, Holden, Pasquarelli. (2003)

15 Jane Langton, «The Weak Place in the Cloth» p 163-180, Fantasists on Fantasy, ed. R. H. Boyer and K. J. Zahorski

## Analytical method

The first stage of the workshop was the viewing and review of fantastic films. The overall task was to determine a taxonomy of cinematic and architecture design parameters, and then decipher which parameters are consistently used to create the unique atmosphere of ‹the fantastic›.
The starting point for our cinematic research was to identify a catalogue of ‹fantastic films› from which to start. The plethora of academic investigation into films and architecture, along with advice from the NIFFF organizers provided us with an initial list for investigation. Over a period of several weeks, participants in the workshop scrutinized a wide range of films and extracted specific scenes where they felt that the sceneography achieved a sense of the fantastic.
From this initial collection, participants chose scenes which specifically featured architecture as a driver of the ‹mood› or atmosphere. For a scene to be considered it was required to meet the initial three criteria as outlined by Todorov; namely believability, engagement, and the willingness to suspend disbelief. The next level of questioning focused on issue of composition: What in the scene gave it a sense of the possible, engagement, and credibility? What in the scene prompted a sense of hesitation or ambiguity? How did the architecture or setting affect appreciation? Would the mood have been the same if the design parameters were different?



*Figure 3*→**VI**
*Scene from Aeon Flux (2005) example of the five ‹fantastic› architectural parameters.*

The final selection of clips were then viewed by all the workshop participants in a series of sessions, and then discussed and analysed. The findings were categorized by both the psychological effect (surprise, fear…) and by identifying the design issues consistent in the scene. These issues were then distilled to their essence; parameters which could be manipulated for effect in architectural design and real world fabrication. From the range of scenes viewed, five main design parameters were identified: *Form, Composition, Texture, Colour, and Lighting.*

### Form

Form, refers to the overall geometry and comprehensive appearance of an object, design, or part of the scene. Form becomes fantastic when it is acceptable within the context of the scene, but when it unexpected, strange, or unique in the context of the viewer. From our analysis, form was often represented by geometry or architecture, which although conceivable or possible, is uncommon for practical reasons such as feasibility, complexity, scale, materiality, difficulty to fabricate, perceived cost. (ex: *Metropolis*. Fritz Lange, 1927)
In addition to the overall impression of form, a secondary theme of dynamic metamorphosis, or ‹morphing›, was often used to transform the familiar into the extra-ordinary (ex: *Dark City*. Alex Proyas, 1998). Animated transformation is an effect that was historically specific to the temporal medium of film, and is easily understood in a programming context as algorithmic interpolation.
In the scenes were form dominated the sense of the fantastic, the form itself was often acknowledged by characters with a sense of awe or fear. This storytelling tactic was used to engage the viewer and amplify their indecision or impression.

### Composition

Composition, addresses both the perception of materiality and the internal geometry and represented structure of an object or design. As with form, the composition of a design was often ambiguous or complex to the point that the viewer could not decipher the visuals.
Four types of fantastic compositions were noted: ‹Pure› composition, made from many components but taking a primary geometric shape (ex: the Death Star from *Star Wars*); ‹Clean› composition, lacking any obvious assembly details (ex: the now pervasive NURBS organic blobs); ‹Complicated› composition, where the object is incomprehensible to the point that overall form is amorphous (ex: Nero's ship from the recent *Star Trek*. Abrams, 2009; or the future reality of the *Matrix*. Wachowski, 1999); and finally the ‹Style› composition, where object having very specific stylistic references to cultures or era's which denote materiality and constitution (ex: steampunk, fantasy medieval, or ancient Egyptian depicted in *Stargate*. Roland Emmerich, 1994)

### Texture

Texture, and the related issue of pattern and surface quality were noted as a design parameter because of their ability to ‹make or break› the believability of a scene. Where effects appeared too ‹flat›, perfect, or if repetition occurred without variation often the scene would slip into the uncanny valley syndrome. Textures and patterns were often used to camouflage geometry and to improve the perception of the construct being natural. Texture is also a significant issue in architecture and likewise is one of the methods to minimize the visibility of imperfections in construction.
The lack of visible texture and the optical characteristics of such surfaces are often used to denote and make obvious man made surfaces. (ex: The digital ‹playscape› in *Tron*. Steven Lisberger, 1982). Likewise the use of mirroring and surface reflection has a psychological history in the fantastic, often representing the concept of dual or alternate worlds (see figure 3) (ex: *Through the Looking-Glass*, or the memory pond in *Aeon Flux*. Karyn Kusama, 2005), but also surface characteristics of highly artificial designed objects (ex: the popularization of digital reflection mapping and morphing in *Terminator 2: Judgment Day*. James Cameron, 1991)

### Colour

The psychological appreciation of colour is highly subjective to both personal and cultural experience. Certain colours have been encoded into society to represent values[16], and as such their specific use can be used to engage perception and denote certain associative qualities.

*«Lighting and colour is often used in conjunction with knowledge of psychological response, to manipulate the perception of the viewer.»*[17]

16 Example: Stoplight- Red = stop, yellow = caution, green = go.
17 Ref: Reid, F. (2001). The Stage Lighting Handbook. New York: Routledge, 6th ed. p. 86

The sensitive use of colour can be used for both the grounding and the unsettling of the viewer. In the real world grass is green and the sky is blue, through manipulation of colour expectations a scene can be transformed from natural to unnatural.
Colour has a longstanding relation to opulence, and resultantly vibrancy of colour is often used with in utopic fiction (ex: the colourful context in the *The Fifth Element*. Luc Besson, 1997). The converse is equally true, where apocalyptic worlds are depicted as dusty, drab, and colourless.

### Lighting

Lighting is perhaps the most direct relational parameter between architecture and film. Light is used in both a tool to control the perception or framing, but it is also the physical basis for vision and the ability to experience all of the previous parameters. Dramatic lighting is used to hide, reveal, and even amplify design, for both film and architecture.
From the human physiology and psychology lighting can be a strong emotional manipulator, used to set the mood, to invoke stress or awareness, and can be used to acutely focus attention.[18] For our purposes lighting is separated from issues of colour due to the implicit physical laws of optics and light. The intuitive understanding of optics and the effective use of light and shadow by cinematographers combine to create another measure of believability. If shadows do not conform to the optics of the scene, there is a strangeness that indicates the presence of the fantastic.
Additionally, because of the omnipresent relationship of light with religion, spirituality, and energy; light as a visual effect is widely used to represent unknown forces, powers, technologies, or supreme beings (ex: the space ships from *Close Encounters of the Third Kind*. Steven Spielberg, 1977) who's shadows and effects do not follow the physics of optics)

## The Fantastic Form

The goal of a ‹fantastic pavilion› was recognized quite early as being ironic, while if we subscribe to Todorov's definition, then as soon as the viewer engages and understands the object the design must become either part of ‹the marvellous› or ‹the uncanny›. As such, the goal of the design team wasn't to achieve the fantastic, but rather it was to heighten and amplify the impression of curiosity and ambiguity for as long as possible.



*Figure 4*→**VI**
*Digital design explorations and physical prototypes for the pavilion*

This project is a design fact. The real world constraints of the site, access, safety, functionality, cost, and the available time for construction meant that the project would need to express the fantastic through ‹minimal means›. Because of these factors, the size, scale, and internal configuration of the pavilion were essentially prescribed. These constraints, however, were not viewed as limitations to the design process, but rather were appreciated as a lens, allowing the team to focus on the components that were changeable by applying fantastic design parameters.

18 *Ibid. p. 12*



### Real but unbelievable

The first decision made was that of materiality. The pavilion was required to stand safely, solidly, and securely for the week of the NIFFF, and additionally there is the intention of re-using the construction in subsequent years. Alcan Composites Switzerland (with whom we had worked before) offered to sponsor material for the walls and roof of the project; as such Alucobond, a composite aluminium plastic sandwich used primarily for façade panels was chosen. Alucobond is lightweight, and auspiciously it is easily workable with numerically controlled fabrication (CNC) machines. Our previous experience the material allowed us to quickly explore prototypes and make decisions about construction systems.
From these investigations it was determined that ‹folding› would be both the primary structuring method and mode of expression, and fastening would be standardized, modularized, and where possible mechanized for efficiency. Finally, the characteristics of the material itself (rather than explicit design) should be exploited to engage specific design issues. The practical task thusly became to build a pavilion, where due to its unorthodox design, materiality, and fabrication methods; the construct provokes the viewer to the fantastic. For our purposes with careful detailing and expressive geometerizing, the structure (the medium of expression) should be visually engaging while simultaneously it should not easily reveal its compositional secrets.

### Designing indecision

To develop the design of the pavilion, a small and quick ‹design ideas› competition was held within the workgroup. (see Fig. 4) The results of this process were analysed for feasibility, metaphoric relation to the topic, and were then refined into a series of potential prototypes. Building upon previous work with folded structures, the design team finally developed a wall system made up of parametrically folded panels. The variable ‹C› section was used for the structural walls, and the remainder of the panel was designed as an ornamental (and also parametric) ‹fin›. This single material – multiple purpose approach is practical and efficient, but would also satisfy requirements for simplicity, solidity, and ease of fabrication.

*Figure 5*→**VI**
*Development of the wall composition, tests for colour, materiality, and design expression.*



Alucobond is typically produced with colour coating on one side and aluminium on the reverse. This material property was then used to address two of the main issues of colour and light. By folding the material ‹around itself› in a C shape the coloured side would be internalized, but would also be reflected by the aluminium side. It was also recognized that by playing with the geometry of each piece, the resulting exterior could be a compositional surface of folds, reflections, and geometry. Alcan Composites, encouraged the designers to play with their full range of colours and materials, and from this the parameter of *Colour* was engaged.

### Digital process

As the formal design decisions were mostly prescribed, parametric programming was used to generate the details and expressive elements for the pavilion.

Programming as a design method is not linear, but is organized as a progressive feedback loop: design decisions are made to the point where a rough geometrical system can be programmed, then the (digital) parametric design is run and the results reviewed, evaluated, and refined. The evaluative method can be either encoded, so that the results are tested against some prescribed fitness criteria, or the results can be evaluated by the designers manually (as was done in this project).
To find the muse for the expressive exterior of the pavilion we revisited film, not as content, but as medium. In keeping with the notion of film as an extended series of varying frames, and with the stop motion image work of Étienne-Jules Marey as an example, the simple mathematical form of the sine wave was chosen as the basis for our design expression.



*Figure 6*→**VII**
*Flattened wall showing sinusoidal composition of period and frequency*

The sine wave, present in much of the stop motion movement analysis, is both cyclical, and a highly recognizable pattern for the human eye. Having its root in mathematics it is an easily programmed expression that could be embedded in the design geometry in multiple ways.
The sine function was encoded with the geometry of the structural prototypes and the results from the trials were ‹fed-back› into the main functional design. The results of this were refined cyclically in efforts to try and both optimize the structure, but also to ensure a design which gave an interesting and engaging effect.
The result of the coding was a spiralling folded wall which was imbued with folds. By building the wall up from multiple folded panels there is an analogy between the movement of the viewer around the exterior of the pavilion and with stop motion images and frames of movement. The computed size and frequency of the panels, the outward flex of each fin, and a simple ‹point-fold› ornament were all organized by the parametric design algorithm.



*Figure 7*→**VII**
*Pavilion wall composition, showing the amorphous effect of the folded wall components*

Although the pavilion required flat internal walls (for the projection of the video art), the design idea was to also use variation in the folding to camouflage or make ambiguous the precise polygonal plan form. The expressive ‹fin› of the exterior surface was parametrically varied both in size and angle so as to render the exterior form more cylindrical. The resulting optical complexity assisted with the illusion that the exterior and interior are somehow dissociated from each other.

## Production and construction

This digital design process meant that the geometry of the pavilion was encoded as data, and as such was very quickly translated into CNC production code. Each of the individual wall pieces were ‹digitally unfolded›, and the flattened cutting pattern were automatically processed so that folds, holes, and cuts were categorized dependant on the appropriate cutting tool (see Fig. 5).
One section of the exterior wall was assembled in the lab to verify that the panels were ‹foldable› by hand, that tolerances for assembly were appropriate, and that the fastening and structural strengths met the calculated expectations. The first assembled section (prototype) provided data which led to minor modification (tolerance adjustments), but due to the programmed master model, the geometry was regenerated immediately and was able to be quickly processed for fabrication.
The processing of the 54 wall panels was completed within 3 days using our own CNC machine in the lapa lab. The panels were then ‹flat packed› and shipped to the site for folding and assembly.
At the site the assembly was systematic, and because the assembly process had been digitally simulated it progressed quickly. The spiral of nine wall sections, each composed of folded panels, was linked so as to be self supporting. The roof, made of Alucore (honeycomb aluminium) panels was the most problematic part of the construction as it was not possible to prototype in advance. The result was that the roof required several (manual) alterations on site before it was in place and considered ‹weather tight›.
The time for on-site construction was 3 days, with an additional day for fitting out the interior (with projection and sound equipment). All told the project time was seven full days, start to opening.



*Figure 8*→**VII**
*Fabrication and on-site construction of the Fantastic Form*

## Design Fiction, Design fact

Once the *Fantastic Form* was installed the designers were able to observe and learn from the reaction of the visitors. Informal surveying was made during the NIFFF, and the response was overwhelmingly positive for this type of architectural design experimentation[19].
By constructing a real, physical, ‹discoverable› design, and by providing full, unfettered access to it, the designers acknowledge that the essence of *the fantastic* in the design can only exists temporarily. If the object is fantastic enough to evoke curiosity, then the rational outcome for a viewer will be investigation and (with experience) understanding. *The fantastic* therefore lies in not in the object itself, but in the procession of experiencing the design. Just as with a film, the fantastic in architecture is a temporal experience, which has a procession of narrative.
It is readily acknowledged that the colloquial understanding of the work *fantastic* may seem inappropriate for this pavilion, but with insight into the research process it is hoped that the specified structural essence of the fantastic has been achieved.
As expectations for both technology and design evolve, so too will the expectations for the fantastic. The ‹Fantastic Form› itself should not be thought of as the conclusion of this research, but, as the pavilion is intended as a showpiece to demonstrate both concepts and technology it can be seen as a prototype of a methodological design concept.
In judging the results of the architectural project by Torodov's definition it becomes clear that any construct that is accessible will eventually lose its percep-

*19 although it should be noted that respondents came from a specific and somewhat biased audience, the attendee's of a «fantastic film festival».*

tion of being fantastic. However this statement shifts the onus of the definition from the object to the *impression of the viewer*. If the impression of the object is opaque, if the object is significantly complex, or if the object is of a scale that somehow defies ‹understanding› then the designation of the fantastic can still be applicable.

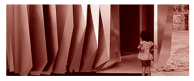


*Figure 9*→**VII**
*Fantastic, uncanny or marvellous?*

## Conclusion

*The fantastic* is more a concept of psychology than a methodology for design. However in grasping the concept, designers are better enabled to engage the limits of expression within their craft.
This research was driven by the engagement of design with speculative fiction, but it has been noted that design in popular fiction does have the capacity to affect the future of both design and society. By combining speculative design with the potential of design fiction, we somehow validate the notion of the fantastic.

*«The fantastic is social commentary combined with good storytelling – Tolkien, C. S. Lewis, the Oz stories and so many others… Sure, the stories take place in an imaginary world, but those worlds mirror our own and tell us things about ourselves that need to be said and understood.»*[20]

If we understand our world as static; as a place where the fundamental rules of reality are fixed then *the fantastic* is impossible. The potential for change and the natural ability for evolution are the origin for creativity, innovation and the related emotional responses of surprise, pleasure, and amazement. The unequivocal fact that change is persistent[21] allows the viewer the possibility of re-evaluating their world and deciding that their current preconceived rules are no longer valid.
Both *design fiction* and *the fantastic* depend on change; to provide astonishment to the viewer as the promised reward for their *suspension of disbelief*, but also as permission for the author or designer to innovate without limitation, interact with the media of expression, and expand the boundaries of the accepted reality.



*Figure 10*→**VII**
*The Fantastic Form, Neuchâtel*

20 *Terry Brooks (writer), quoted from http://en.wikipedia.org/wiki/Fantasy*
21 *As Heraclitus once stated «change is the only dependable constant.»*



## References

*Boake, T.M. (2005) Architecture And Film: Experiential Realities And Dystopic Futures, University of Waterloo, Cambridge, ON*

*Caillois, R. (1965) Au Cœur du Fantastique, Gallimard, Paris*

*Fear R. (ed), (2000) Architecture and Film, in Architectural Design vol 70 no. 1. London: Wiley Academy.*

*Langton, J. (1984) «The Weak Place in the Cloth» p 163-180, from Fantasists on Fantasy, ed. R. Boyer & K. Zahorski, Avon Books, New York.*

*Mori, Masahiro (1970). Bukimi no tani The uncanny valley (K. F. MacDorman & T. Minato, Trans.). Energy, 7(4), pg. 33-35. (Original in Japanese)*

*Penz, F. ed. (1997) Cinema & Architecture: Melies, Mallet-Stevens, Multimedia. British Film Institute, London, UK.*

*Penzoldt, P. (org: 1952) The supernatural in fiction, Buffalo, NY. Prometheus Books (reprint 1965).*

*Prince, S. (2004) True Lies: Perceptual realism, digital images, and film theory. Pgs. 85-100: In Film theory: critical concepts in media and cultural studies, Volume 4. Simpson, P. et al. (ed.) Taylor & Francis, NY.*

*Reid, F. (2001). The Stage Lighting Handbook. New York: Routledge, 6th ed.*

*Sharples, Holden, Pasquarelli. (2003). Versioning: Evolutionary Techniques in Architecture, in Architectural Design vol 72 no. 5. London: Wiley Academy.*

*Sundar, S (2007). The MAIN Model: A Heuristic Approach to Understanding Technology Effects on Credibility. In Digital Media, Youth, and Credibility Metzger, M.J (ed.) MIT Press, Boston.*

*Todorov, Tzvetan. (1975). The Fantastic: A Structural Approach to a Literary Genre. Ithaca, NY. Cornell University Press.*

*Tschumi, B. (1996). Architecture and Disjunction, The MIT Press, Boston*

*Vax, L (1965), La séduction de l'étrange. Paris, FR. Presses Universitaires de France.*

*The author would like to thank the workshop participants and the collaborating institutions for their involvement and work in this project. We would also like to express our gratitude to the material sponsors of the project for making it possible. Full credits are displayed in the on-line publication of this paper.*

Mònica Gaspar Mallol Independent researcher and curator, Barcelona / Zurich, ZHdK Zurich University of the Arts, Dept of Cultural Analysis, monica.gaspar@yahoo.es

# Displaying f(r)ictions. Design as Cultural Form of Dissent

Keywords: cultural analysis, aesthetics, micropolitics, critical design, craft, curating

This paper examines at close quarters the role of fictions in design, in order to push forward the scope and influence of critical discourses in design. It aims to raise a cross-disciplinary debate around the redefinition of the design profession and also around the practices of curating and reflecting on design. Main theoretical reference has been «The practice of Everyday Life» by French sociologist Michel de Certeau. Certeau's work has influenced the thinking of three authors that were relevant to further elaborate this study: the combination between material culture, design history and gender studies by Judy Attfield; the theory on relational aesthetics developed by Nicholas Bourriaud and the thinking of Jacques Rancière, specially his notion of dissent as form of political subjectivity that can create new modes of sensing.

In order to test its arguments the paper establishes two scenarios, where negotiations between reality and fiction take place: the home and the museum. On the one hand, representative examples of critical design are examined and put in dialogue with the theoretical positions. On the other hand, the paper examines the transformations that happen in the museum's space, when displaying critical design becomes a kind of rehearsal for alternative ways of living. Two exhibitions were analysed: Wouldn't it be nice… Wishful Thinking in Art and Design (Museum für Gestaltung, Zurich, 2008) and Out of the Ordinary: Spectacular Craft (V&A, London, 2008).

The final part of the paper discusses how such positions in design play a critical role in society, by setting up micro-situations of dissent (disagreement), and in doing so they generate new forms of sensing and making sense in contemporary living. Conclusions will point at the potential of these design fictions (understood as projections) and frictions (considered as irritations) in order to re-fabulate the commonplace.

## Introduction

This paper bases on an ongoing research, which aims to articulate the critical in design and present it as a relevant agent for understanding cultural processes of world making and making sense in contemporary living. The contents have been further developed from a MAS degree project in Cultural Gender Studies at the ZHdK in 2008. Dealing with complexity of the ‹here and now› instead of choosing the isolation of a historical exercise, the paper uses a rather ethnographic approach, within the frame and methodologies of critical theory and cultural studies. Analysis and interpretation, rigour and flexibility were applied to test a possible discursive basis for the critical in design.

### Everyday life, a moving target

*«What we need to question is our table manners, our utensils, our tools, the way we spend our time, our rhythms. To question that which seems to have ceased forever to astonish us.»*
*Georges Perec, Approaches to What?, 1973*

«That which seems to have ceased forever to astonish us» is the everyday life that so restlessly challenges all attempts of being fixed into one single category. The crucial importance of the quotidian was recognised by Michel Foucault,

when he defined the «micro-physics of power»[1]. The question raised by the French writer Georges Perec in his article *Approaches to What?*[2], has troubled and inspired several intellectual traditions too, from Surrealism to the Situationists; and today from cultural studies, to relational art or critical design. Perec's question was raised to find out what kind of reality laid bare underneath cultural and ideological conventions that society had naturalised as hegemonial discourses. He opted for making meticulous inventories of his most immediate surroundings in an obsessive way, drawing up lists and mapping experience.

Looking at recent developments on the study of everyday life one finds similar attitudes and methods that also oscillate between the scientific and the poetic. From the ‹micrologies of everyday life›[3], to the ‹ethnologies of proximity›[4] and the ‹cartography of the everyday›[5]. Today, the prefix ‹micro-› has invaded the terminology of social and cultural phenomena, as an index for such awareness: from Internet micro-transactions in e-commerce to micro-credits flourishing in economy (Nobel awarded Muhammad Yunus, 2006), while art sets up ‹relational micro-utopias›[6] or literature describes the ‹micro-pleasures of a sip of beer›[7].

But how to pay attention to the understated everyday? It happens in the nearby, marginal, almost invisible, ignored by grand discourses, camouflaged in the most obvious situations. To grasp the everyday seems to be a question of heightened awareness, as the literary theorist Michael Sheringham[8] points out: one can only ‹attend› the everyday; it only becomes visible when it receives attention.

Today, critical voices in design try to sharpen this awareness, by creating tools, interfaces, signs or artefacts that act as poetical devices to deal with the increasing complexity of the contemporary existence. This tendency has been named ‹Critical Design›[9], ‹Conceptual Design›[10] ‹Progressive Design›[11] or ‹Interrogative Design›[12]. Critical positions in design engage in ethical issues around technology, society or cultural production, looking for metaphorical or actual implementation.

That everyday life is the central issue of design could sound like an obvious statement, but precisely because of this obviousness, critical designers decide to de-construct the dominant, hegemonial landscape of things and attitudes. The reflective exploration of the un-spectacular everyday could be understood as a sceptical position against spectacularisation of all products and the acknowledgement that it articulates a personal space, which is neither branded nor sponsored. This is the unstable and changing space of resistance that works on alternative realities, in an imaginative and energic way. This is the humanist side of *The Practice of Everyday Life*, by the French cultural theorist and sociologist Michel de Certeau[13], whose work has become the main theoretical reference of this research. Certeau's writing is associative, does not follow a linear discourse and mixes fiction (stories, imaginary scenarios) with truthful reports on reality[14]. In this book he developed a theory about the lived space, where ‹operational combinations› and ‹models of action› carried out in everyday life were described as legitimate components of culture. Certeau focuses on citizens' behaviour and their creative potential as consumers or users, changing the traditional view on these actors as oppressed or passive inhabitants of a social structure. This is the creative and unpredictable realm of Non-Intentional Design to use the term coined by design theorists Uta Brandes and Michael Erlhoff[15], which is a research area of increasing relevance for user centred theories in design today.

## Weaving the plot

Certeau describes popular tactics as genuine means of operating in everyday life, performed by ordinary people as ways of empowerment. He distinguishes three main domains of action: «*…insinuated styles of social exchange, technical invention, and moral resistance*»[16]. His observations on issues of authorship, appropriation, subversion of hegemonial discourses and temporary personal articulations offer a rich catalogue of instructions. Many attitudes in critical design share complicity with Certeau's programme:

*Social exchange (or a gift economy)* can be applied to non-productive, non-rewarded activities (from relational installations to taking part into Web 2.0 communities). Participation, interaction and sharing of creative processes (appropriation and co-authorship) are also characteristic. The set of possible political actions that the individual is able to take in an apparently free way, within a given social structure can inspire products that reflect on this potential and encourage a more engaged perception of everyday gestures and commitments. (Fig. 1)

Figure 1→**VIII**
Passing on knowledge and cooking for others. (Photo: MG)



*Technical invention (or the aesthetics and mechanisms of trickery)* conceptual designers behave as consumers, as artists or as amateurs, by using and misusing existing products as a raw material, creating semantic interferences, mixing proper and improper codes through a process of re-organisation and dis-organisation. By taking on board a heterogeneous approach to the act of designing and making, critical designers declare the profession of industrial designer in crisis. The results are controversial objects that speak about emergency solutions or for example precarious economy. (Fig. 2)

Figure 2→**VIII**
Non-intentional design: tools improvised by workers on a construction site (Photo: Juli Capella)



*Resistance (or the persistence to achieve a purpose)* is characteristic of designers that take on board ‹slow› projects, with commitment and tenacity, like encouraging emotional attachment through objects that resist to be thrown away, plotting sustainable futures or practicing different forms of social activism. The philosopher Yves Michaud[17] has referred to these attitudes as ‹quiet violence›, exercised by the upcoming generations of designers. (Fig. 3)

Figure 3→**VIII**
Following the rule… almost. (Photo: MG)



Like the studies on everyday life, critical design is also a practice on the edge. Its position is peripherical and minor compared with the dominant discourses around design. The design historian Stephen Hayward[18] analysed the equivalences between the Modern Movement spirit and the notion of good design, good taste and therefore common sense and good citizenship, as one of the most deeply embedded orthodoxies of the 20th century. Critical positions on design trouble the ‹official› history of design and open a discussion about hegemonial discourses. If modern design has become the mainstream design of the 21st century, then critical design can be clearly defined as the inconvenient ‹other›. These designers adopt a nomadic attitude, leaving the hegemonial context of the marketplace but still staying inside the territory, penetrating it again and moving across it, while exploring the periphery of their profession and testing the ground of other neighbourhoods, from artistic territories to the ones of social activism. ‹Every story is a travel story, therefore a spatial practice,› states Certeau. Maybe this is one of the reasons why the narrative element of telling stories, generating meaningful fictions is so central in critical design.
In order to test these thoughts this paper establishes two scenarios, where negotiations between reality and fiction take place: the home and the museum.

## Contingent homes

In an over-aestheticised world of commodities and highly saturated semiotic landscape of images of desire, the domestic space appears as a site of resistance, invention, comfort, privacy and contested place for constructions of identity. Work and leisure blur their borders, while the different spaces of the domestic interior are increasingly being detached from fix functions in order to adopt floating rituals and host changing functions. ‹Home› becomes more a state of mind, rather than a specific place.

Designers are aware of the contemporary need of fictions[19], and that the home is a space of limited but legitimate freedom to stage alternative realities. After analysing sixteen representative works by selected designers coming from different backgrounds (product design, architecture, applied arts) and different European countries (United Kingdom, The Netherlands, Sweden, Switzerland and Spain), it became obvious that critical design has a considerable impact on the re-invention of the home. By observing how people arrange their personal spaces following purpose, desire or circumstance and taking seriously the background of lived experiences, designers subvert stereotypes, exploring the estrangement of the commonplace with reflectiveness, fantasy and irony. This purpose also includes exploring the ‹no-go areas› censured by Modernism, for example sentimentalism, kitsch, fetishism, and decoration, taking also into account the gendered connotations of these issues.

The tactics described by Certeau take place mostly in the public space (walking in the city, shopping…), perpetuating a gendered distinction between the activities that happen at home and the ones that take place on the street. Critical designers challenge Certeau's convention by exercising tactics, originally assigned to the open space, inside the home, tracing new indoor psycho-geographies for the domestic landscape in the 21st century. (Fig. 4)





*Figure 4* →**VIII**
*Anna Pla, This is not a graffitti, urban intervention, 2003, Barcelona. (Photo: Anna Pla) Looking for the gaps and loop holes in town-planning regulations, the architect Anna Plà develops the project ‹This is not a graffiti›. She rents a parking space on the street, but instead of using it for parking her car, she sets up temporary domestic situations: half an hour for having a tea, two hours for sleeping, working on the computer, baby-sitting… Anna Pla's contingent home questions the nature of micro-contracts and micro-transactions agreed between individuals and institutions.*

The very personal experiences of rehearsing, manipulating and producing; in short, the chance to participate in the making of the material culture of everyday life is at the core of the design profession. Nevertheless, the experience of engaging in the act of designing is not confined to professional designers, nor amateur D.I.Y activities such as home decorating, «it is something that most people do everyday when they put together a combination of clothes or plan a meal»[20]. (Fig. 5)



*Figure 5* →**IX**
*Martí Guixé, Plant me Pet, 2003. Produced by Cha-Cha, Barcelona. (Photo: Imagekontainer/Knölke) Martí Guixé has developed a personal and influential aesthetic of instruction manuals, as a way to raise awareness on issues of agency and participation. But giving instructions to poetic objects reminds that the fine line between critical and conventional design is still there… After all, design is a process, which is concerned with the control over the form of objects and environments. In doing so, Guixé makes explicit the social codes of design and unveils its mechanisms of power.*

The return of materiality and processes in contemporary art and design, rediscovering potential in both traditional and innovative materials and techniques, go hand in hand with the very current protagonism of craft. It reaches from a broader public attention through a more extended DIY culture, until the realm of academic and museum discourses. The recent wave of craft activism, from internet sites to urban guerrillas, understands craft as more than a method of production, but as a transformative and conceptual tool, a door opener for self-sufficiency, political statement and community building. (Fig. 6)

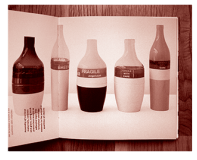


*Figure 6* →**IX**
*Hella Jongerius, Long neck and groove bottles Vases, 2000. Amsterdam. (Photo: MG) Some designers explore the handmade in all its facets, from virtuous craft to handy DIY. The gender distinction in amateur crafts pointed out by Attfield, blurs away when male designers opt for macramé techniques (Marcel Wander's Knotted chair) and women designers go for ‹rough&ready› DIY solutions. As example, the vases by Hella Jongerious result from the radical assemblage of glass and ceramics through masking tape.*

The critical attitude in design is not only focussed on the politics of making and the statements behind it but also in the interfaces between people and objects and the resulting meanings and experiences that these interactions may generate. (Fig. 7)

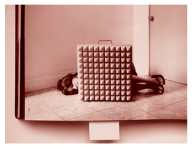


Figure 7→IX
Anthony Dunne and Fiona Raby, Electro-Draught Excluder, from the Placebo series, 2001, London. (Photo: MG)
Anthony Dunne and Fiona Raby are interested in the ethical impact of new technologies in everyday life. Designing for ‹fragile personalities in anxious times› developed objects to help people overcome phobias, anxieties and other paranoia generated by the everyday ‹invisible design› that surround us: electro waves, magnetic fields, noise, etc. Here, the Electro-Draught Excluder is a screen able to stop radiations and provide emotional comfort and trust to the user.

The design propositions by Dunne and Raby and their consistent, aesthetic and intriguing use of intermediality (text, objects, photography and video) is paradigmatic of cultivating fictions as conscious strategy. Fictions her are not understood as mere illusions, but as highly specialised forms of making visible «that which had no reason to be seen, lodging one world to the other»[21], as it will be detailed further in this paper.

## Rehearsals in the museum

Critical design is deeply rooted in the everyday but, paradoxically, it does not fully become part of it, because of its speculative, sometimes utopical dimension. Such disencounter is something symptomatic of the crisis of design as profession, as Klaus Krippendorff states, design is thorn between «industry's interest in developing competitive technologies and achieving high sales volumes on the one hand, and the cultural institutions' attention to making publicly significant, meaningfully discussible, and culturally or artistically influential contributions on the other hand. The two conflicting institutional demands yield artefacts that are – in the extreme – either mass produced but not much talked of or never manufactured but put on a pedestal and cheered.»[22]

Since critical design is making use of an increasingly specialised circuit of presentation and debate and also using the formats of an art exhibition, research went on examining the transformations that happen at the museum's space, when displaying critical design becomes a kind of ‹conceptual shopping› (Dunne, 2005) or a rehearsal for alternative ways of living. To do so, two exhibitions about critical objects were analysed and compared: *Wouldn't it be nice… Wishful Thinking in Art and Design*[23] (Museum für Gestaltung, Zurich, 2008) and *Out of the Ordinary: Spectacular Craft* (V&A, London, 2008). Interviews to the curators added essential information to the research material. The content of both exhibitions appeared as paradigmatical for a discussion about fabrication and legitimation of parallel, alternative realities, through the making of ‹engaged› cultural artefacts.

### Exhibition 1: *Wouldn't it be nice…*

The point of departure for that exhibition was the invitation made to five designers and five artists to materialise a wish, making use of utopian thinking as experimental tool. The objects and installations at the ‹Wouldn't it be nice…› exhibition were representative of a certain way of understanding design today. Such design is self-reflective, engaged critically with the present and adopting serious, playful of poetic formats. Some practitioners gave importance to processes and durations, others set up relational situations or offered precarious solutions with a kind of low-tech aesthetics. The works, one-offs or limited editions, stayed ambiguously between artwork, prototype and finished product in order to involve the user in its conceptual or material finalisation.

Katya García Anton writes on her curatorial text for the catalogue: «Yet a work of art or design, if critically engaged with culture, could have a level of ambition that includes at least the distant possibility of making a difference to the social and political condition.»[24] This ‹distant possibility›, should not be a remote one, but the core of the intellectual endeavour of critical design. The projection into the future, places such works in an intermediate stage between reality and fiction that resists an instantaneous commoditisation.



Figure 8→IX
View of the Wouldn't it be nice… exhibition in Zurich

### Exhibition 2: *Out of the ordinary*

Under the title *Out of the Ordinary. Spectacular Craft*, the exhibition showed the work of eight artists and designers-makers, who master different, highly specialised, traditional and new technologies. Aim of the exhibition is «to challenge preconceptions and broaden horizons of craft», and to show how the use of craft understood as process (not as category) «can transform everyday subjects and materials into extraordinary works»[25]. All practitioners place the everyday as central subject of their work. The exhibition tackles on the debate of gendered disciplines (the textile works defined as ‹gynotechnics›), different perceptions of folk traditions and the ‹spectacle of otherness›, by including work by artists and designers – makers based in Nigeria and China.

The curator's selection criteria for the exhibited works were ‹meticulous making›, ‹transformation› and ‹the overlooked object›. Such parameters echo Certeau's tactics, such as tenacity, transformation/subversion and invisibility. The exhibition presents itself as an art show, within one of the world's leading museums of applied art and design, while the language of the displayed works connect to the ‹objet d'art› tradition, in the same way that the DesignArt phenomena, displayed in contexts like the Design Miami Basel fair.



Figure 9→IX
View of the exhibition Out of the Ordinary in London. (Photo: V&A Press material)

## F(r)ictions

To elaborate on the sophisticated, refined and virtuous side of making objects today and to claim the low-key approach of the DIY aesthetics shown in radical positions in design are two faces of the same coin. What today is understood as design is not anymore reduced to the strict domain of industrial

products. Designers and artists in both exhibitions take a clear stance away from mass-production. The examined objects in this study carry an inherent tension between commodity and artwork that makes them ideal for a reflection on the implications of ‹the gesture of showing› (Bal, 1996). Part of this research drafted a possible model for curating and displaying critical forms of design. «But telling stories is more difficult than you think…» warns the cultural theorist Mieke Bal[26], especially when critical design generates highly metaphoric objects. Ball distinguishes two possible readings of objects, based in rhetorical figures: objects as metaphors or as synecdoche. In principle, artefacts of material culture, like design objects, should not be read as ‹metaphors› (like expressive works of art) but as ‹synecdoche›, a rhetoric figure, where a small part of something stands as representation of the whole of it. Giving a metaphorical treatment to design objects is in many ways a form of disruption to the museographical norm and opened new possibilities to curate them.

After analysing the two shows it became clear that it would be necessary to approach more critically relational aesthetics, which at the moment has a clear dominance in the debate on curating critical design and contemporary craft. The theory developed by Nicolas Borriaud transforms the space of the museum into a laboratory, open to host non-artistic situations and enabling artists and audience to live authentic experiences in the frame of an ‹everyday micro-utopia›[27]. He describes a shift in attitude toward social change: instead of a futuristic agenda, today's artists seek to find provisional solutions in the here and now, «learning to inhabit the world in a better way». Parallels are found in the positions adopted by critical designers, but the question is not so much if the boundaries between art and design mingle, but to point at the need of design to continue exercising its very essence of projecting, inspiring alternative scenarios, artefacts, signs and interfaces for the future. In order to do so, design with a critical edge does not limit itself to compensate what is missing in society within the protected environment of art world, like a «therapeutics for deteriorated social relations»[28], but it also aims to engage fully with real life.

For negotiating possible futures it is necessary to understand the double game with the word ‹fiction› as projection and ‹friction› as irritation, as suggested in the title of this paper. In the thinking of the philosopher Jacques Rancière, both meanings seem to fuse in one single word, ‹fiction›, which he also refers as ‹dissent›. Rancière describes fictions as processes that establish new relationships between appearance and reality, «visualizing an encounter of incompatibilities»[29]. Fictions in contemporary aesthetic practices, be it in art or design, «configure experiences that can create new frames of sensing and introduce new forms of subjectivity»[30]. Fictions, as form of *Dissent* are at the core of politics, which is not so much about a conflict of interests between different groups, but keeping the possibility to confronting one vision of the world with another alternative one. Consensus on the contrary, is the reduction of politics to the police; «it is the end of politics and not the accomplishment of its ends but simply, the return of the normal state of things which is that of politics' non-existence. Consensus is determined to erase the very concept of politics, and the precariousness and undecidedness which are its essential elements».[31] Rancière's theory on politics contributes to articulate critical positions in design in order to raise awareness to such fundamental activity of generating fictions. The challenge to the dominant discourse on design can be found in both of the analysed exhibitions, which were controversial and not always well received by their respective professional communities. At the same time, critical designers and their formerly described positions, reject to be ‹exiled› to the art world in order to keep in friction, making their points without leaving the contested territory of their own profession.

## Conclusion

Starting from a reflection on the micro-strategies performed by ordinary people in their daily life in order to project alternative realities, this paper has reflected on the role of fictions as projections and as irritations (frictions). This research concludes stating that when design adopts a critical discourse is able to create new frames of sensing. These frames can be interpreted as interfaces that are able to create temporary, precarious spaces for rehearsing alternative ways of thinking and acting. As suggested in the described examples, there are many ways to create agency situations that make visible the constant negotiation between individual decisions and imposed structures, the constant encounter of incompatibilities and the call for design beyond consensus. But again, and following Rancière, it is about the act of reframing, not about believing that design alone can awake a political subject in every individual, which must have been the failure of some design traditions, when they have become ideological.

Further research in a cross-disciplinary context is envisaged, in order to debate and investigate in more depth, how these design strategies can be formed and articulated. Krippendorf advocates for re-empowering the rethorical strength of the design discourse, while Rancière's definition of dissenting is very close to the poetical unfriendliness of design described by Anthony Dunne. Designers embracing the complex and fragmentary character of contemporary living will have to develop new ways of sensing and making sense, in order to challenge and re-fabulate the commonplace once again.

## Endnotes


1 Foucault, Michel, Surveiller et Punir. Paris: Gallilmard, 1975. (p. 165)

2 Perec, Georges «Approaches to What?» in L'Infraordinaire. 1973. In PEREC, Georges, Species of Spaces and other Pieces. London: Penguin Book, 1997. (p. 210)

3 Attfield, Judy, Wild Things. The Material Culture of Everyday Life. Oxford/New York: Berg, 2000.

4 Augé, Marc, Non-Lieux, introduction à une anthropologie de la surmodernité, Le Seuil, 1992.

5 Grossberg, Lawrence, We gotta get out of this place. Popular Conservatism and Postmodern Culture. London/New York: Routledge, 1992.

6 Bourriaud, Nicolas, Esthétique Relationnelle. Paris: Les Presses du Réel, 1998.

7 Delerm, Philippe, La Première gorgée de bière et autres plaisirs minuscules. Paris: Gallimard, 1997.

8 Sheringham, Michael, Everyday Life: Theories and Practices from Surrealism to the Present. Oxford: Oxford University Press, 2006.

9 Critical Design is a term coined by Anthony Dunne and Fiona Raby in Design noir. The Secret Life of Electronic Objects. Basel: Birkhauser, 2001.

10 Conceptual design mainly represented by the Droog Design approach, following the Wörterbuch Design. Design Dictionary, edited by Michael Erlhoff and Tim Marshall (Basel: Birkhäuser, 2008).

11 Progressive design, like «progressive music», term used by Andrew Blauvelt, curator of the exhibition Strangely familiar. Design and everyday life. Minneapolis: Walker Arts Centre, 2001.

12 The Interrogative Design Group, founded by the artist Krzisztof Wodiczko and established as a research team at the Massachussets Institute of Technology since 1997.

13 Certeau, Michel de, The Practice of Everyday Life. Berkeley, University of California Press, 1984.

14 Quotating Rainer Winter, Certeau does not follow «…die Logik der Anwendung bzw. Der Subsumtion, sondern die Logik der Erfindung, die sensibel für alternative Wirklichkeiten ist». See Rainer WINTER «Das Geheimnis des Alltäglichen. Michel de Certeau und die Kulturanalyse» in FUSSEL, Marian (ed.), Michel de Certeau. Geschichte, Kultur, Religion. Konstanz: UVK, 2007. (p. 206)

15 Brandes, Uta and Michael Erlhoff, Non Intentional Design. Stuttgart: Daab, 2006.

16 Certeau, Op.cit, p. 26

17 Michaud, Yves. «An ethnographic approach to contemporary art». Lecture for the inauguration of the 2002-03 academic year. Barcelona, Escola Eina, 2002

18 Hayward, Stephen, « <Good Design is largely a matter of common sense>: Questioning the Meaning and Ownership of a Twentieth-Century Orthodoxy» in Journal of Design History, Oxford University Press, 1998. (Vol XI, nº3, pp. 217-232)

19 The exhibition «Form follows Fiction» (Museo d'arte contemporanea, Torino, 2002), curated by Jeffrey Deitch, (known for his exhibition Post-human, 1992) shows the affinity of concerns between art and design. Cutting-edge subjects are soon integrated into mainstream market, like Alessi's «Family follows fiction» series of playful utensils (1995). But watching the dates… Alessi was first! Who follows whom?

20 Attfield, Op.cit, p. 17

21 Rancière, Jacques, «Ten Theses on Politics», in The Journal for Theory and Event, John Hopkins University Press, Baltimore, Vol. 5, nº 3, 2001.

22 Krippendorff, Klaus, «Redesigning Design. An Invitation to a Responsible Future» in Tahkokallio, Päivi & Susann Vihma (Eds.) Design - Pleasure or Responsibility? Helsinki: University of Art and Design, 1995.

23 The exhibition was produced in Geneva by the Centre d'Art Contemporain, and then traveled to Zurich under the title «Wouldn't it be nice… 10 Utopien in Kunst und Design» and to Summerset House, London.

24 García Antón, Katya; Emily King and Christian Brändle. Wouldn't it be nice… Wishful Thinking in Art and Design. Geneva: JRP/Ringier, 2007. (p. 61)

25 Britton Newell, Laurie, Out of the ordinary: Spectacular Craft. London: V&A Publications and the Crafts Council, 2007

26 BAL, Mieke, Double Exposures. The Subject of Cultural Analysis. London and New York: Routledge, 1996. (p. 166)

27 Bourriaud, Op.cit., p. 45

28 Certeau, Op.cit. p. XXIV

29 Rancière, Jacques. Die Aufteilung des Sinnlichen. Ästhetik und Politik. Berlin: b_books, 2006. p. 88

30 Rancière, 2006, Op.cit., p. 20

31 Rancière, 2001, Op.Cit.

Regina Peldszus Design Research Centre and Astronautics & Space Systems Group, Kingston University London, UK, regina@spaceflightdesign.org
Hilary Dalke Design Research Centre, Kingston University London, UK, h.dalke@kingston.ac.uk

# Spaceflight Settings as Laboratory for Critical Design

Keywords: Human spaceflight, space psychology, design fiction, speculative design, critical design, aesthetics of use, DIY, human condition, space stations, extended exploration missions

This paper reflects on the findings of a three-year research project on context, approaches and concepts in design for spaceflight, with a focus on isolation and monotony in extended exploration missions.
It presents a meta-conclusion of how behavioural and emotional aspects in a high tech, extreme environment setting such as human space missions constitute a unique laboratory for critical design. The study included ethnographic and archive research, simulation studies and design development.
Based on this data, the notion of the design laboratory is argued through an analysis of the International Space Station as critical design artefact; a portrait of the astronaut as designer, tinkerer and hacker in the spacecraft; and a proposal of how designing speculatively for a future mission to Mars or a Near Earth Asteroid can yield insight on ground-based contemporary social and human-technology interaction. The paper offers several approaches for practical implementation of such a laboratory exercise, and is intended as preliminary manual for engaging in critical design activity in a space context for the mission planner and speculative designer alike.

This paper proposes that orbital and extended space exploration settings – such as current use of the International Space Station (ISS) or future missions to Near Earth Asteroids (NEA) or Mars – can serve as laboratory at the interface of design fact and fiction to interrogate basic human values, activities and needs. This hypothesis evolved from a concluding reflection of the findings of the three-year study *Designing Emotional Survival* into context, approaches and concepts in design for human spaceflight. Focus of the study was the psychological habitability of extended space exploration missions with a special emphasis on addressing monotony and isolation during transfer phases between earth and the planetary surface.
The first section of this paper provides the topical context of the spaceflight setting and an outline of the original study. Based on a rationale and key assumptions for critical design in a space context, the laboratory hypothesis is presented through three example cases: (i) an interpretation of the ISS as artefact of critical design that pushes the limits of the lived experience, embodies human values and challenges the status quo; (ii) a portrait of the astronaut as designer exposing aesthetics of use in microgravity through Do-It-Yourself (DIY) activity; and (iii) a proposal for utilising the psychological challenges of an interplanetary mission as scenario for designing for the human condition. The paper concludes with suggestions to practically implement collaborative or studio-based design exercises using space settings as a laboratory with special focus on analogous field immersion and low-fidelity simulation.

## Designing Emotional Survival – Research Context

Aside from physical survival, psychology presents a key challenge in extended spaceflight and critical factor for mission success (Solodilova-Whiteley, 2007). A radically altered sensory environment and isolated, confined co-habitation with a small crew yield stressors that include monotony and interpersonal conflict (Kanas & Manzey, 2003). Cosmonauts and astronauts have experienced depression, anxiety, boredom and tension (Connors, 1985) but also regard their work as fulfilling, enjoyable and life altering (Ritsher et al., 2007).

The countermeasuring of stressors in space foresees either the preparation of the individual or the adaptation of the spacecraft environment through design. Environmental recommendations that specifically address psychological challenges include the design of crew quarters and human activity, opportunity for flexibility and control through the crew, and applications for leisure and social interaction (Suedfeld & Steel, 2000). In operational space human factors and

habitability we can distinguish between three historical phases. The early days prioritised design for survivability and were dominated by the field of engineering. This gave way to a ‹humanisation› of space hardware through designers and psychologists in the advent of long duration missions of the 1970s. Requirements will again be more complex in future deep space exploration missions that are characterised by a high degree of crew-autonomy and self-reliance (Zimmerman, 2003; Zukowsky, 1999; Rummel, 1992). The role and application of design in these future settings was the focus of the study *Designing Emotional Survival*.

## The Study

The research was conducted between 2007 and 2010. Three phases of broad, in-depth and applied enquiry roughly corresponded with a three-fold methodology of ethnographic field research, taxonomisation of archive material, and design development and testing. The main proportion of this was conducted in collaboration with stakeholders of the space programmes of Europe, the US and Russia.

A series of conversations with inhabitants of space and space analogous environments produced primary data on user relationships in capsule habitation, including mundane aspects of human activity and routine housekeeping. For a detailed view on the role of design in a habitability context, a four-month study carried out at ESA's European Astronaut Centre linked human issues to the system engineering process for future systems development. This was supplemented with visits to life science laboratories at NASA Ames Research Center. A separate study then explored speculative design development in science fiction through an analysis of selected production designs of the film 2001: *A Space Odyssey* at the Stanley Kubrick Archive in London and the systematic sampling and data-mining of 30 science fiction films with plots comparable to extended exploration missions. Finally, the development of conceptual products, interactions and environments manifested emerging themes with emphasis on off-duty aspects in space, including collaborative design studies on leisure applications and integration of plant-growth facilities (Häuplik-Meusburger et al., 2009; Häuplik-Meusburger et al., 2010). Designs were tested either as preliminary mock-ups or in form of applied recommendations in several user contexts, including two ground-based Mars mission simulations: the ongoing long-duration isolation study Mars500[1] at the Institute for Biomedical Problems in Moscow, Russia, and a segment of a short-duration study at the MDRS[2] facility in Utah, US.

To conclude the study, an outline of technology transfer issues from space to ground-based medical or transport contexts was planned initially. A meta-reflection of the findings of the study, however, resulted in an alternative interpretation of spin-offs and the suggestion to use spaceflight settings not as the literal laboratories for research and development that they are usually regarded as, but as platform to engage with values, aesthetics of use and the human condition.

1 *In collaboration with Ralf Heckel, International Space Education Institute, Leipzig.*

2 *In collaboration with Irene L. Schlacht, Human-Machine-Systems Department, Technical University Berlin.*



## Design Fiction for Space Realities: Speculation by Default

Due to the unparalleled nature of interplanetary space exploration missions and the high cost of testing hardware and concepts in earth orbit, design for space is speculative by default. At the same time, direct field immersion in the user context – an invaluable instrument for any designer at pre-concept stage – currently pose significant access challenges[3]. Anticipating extended stretches of complete isolation in a remote itinerant vessel, and the ‹earth-out-of-view› phenomenon of a Mars mission, for instance, is even more difficult. With this limited possibility of establishing the kind of personal empirical baseline data usually readily available in consumer technology contexts, approaches with fictional elements of scenario building, modelling and simulation gain in importance.

Simulation studies and astronaut training utilise scripts to rehearse or play out fictional but principally feasible interactive tasks, activities and events (Baranov, 2001). Similarly, narratives are used in space mission planning or for virtual organisational environments, public outreach or collection of data on human interaction[4]. Yet the most prominent interface of fact and fiction in a spaceflight context today is probably still science fiction. Since the early days of human spaceflight, narrative speculation has been used as medium to communicate and promote space futures (von Braun, 1971; Clarke, 1972). Film manifested human values and ideas in production designs with detailed scenarios of a future – sometimes didactic or affirmative, such as *2001* (1968) or *Doroga K Zvezdam* (1955) sometimes critical or satirical, as in *Dark Star* (1974) or *Alien* (1979).



*Figure 1* →**x**
*Reality versus fiction: A mock-up at the Graphic Research Facility at NASA Johnson Space Center; and director Duncan Jones on the set construction of Moon (Images: NASA; Liberty Films)*

One way to approach latent emotional needs and values in space could be the introduction of channels from critical extensions of terrestrial design with their fictional, reflective and speculative properties to make mission scenarios more robust (Peldszus et al., 2010). Space mission planning, i.e. the charting of system architectures and programmes (Larson & Pranke, 1999), already contains underlying narrative elements: mission timelines are essentially overarching meta-narratives to structure events, while trajectories anchor these in specific locales. Design fiction could help uncover aspects of human behaviour, and their design implications, *before* requirements are written for hardware concepts.

If spaceflight could be enriched by engagement in design fiction and critical design activity, the question emerged whether this relationship could be reversed – i.e. can spaceflight present a playground for the speculative or critical designer in its own right? Critical design involves challenging our stereotypes regarding objects and environments, functions and human needs (Robach, 2005) by evoking reflection on interactions and their implications (Dunne & Raby,

3 *As of April 2010, only 517 different people have accessed orbital space (Harwood, 2010).*

4 *Such as MIT's Mars Escape or NASA's MoonBase Alpha.*

2001). Spaceflight and critical design are ideally positioned for a comparative synthesis, as they share a number of key concepts that offer a base for leverage: They both address interactions, which they either refer to as trade-offs within a system (Riley & Sailor, 1962; van Hinte & van Tooren, 2008) or relationships (Blauvelt, 2010). They project their efforts to a future or alternative present scenario, relying on some form of foresight thinking, and express these as prototypes, diagrammes, or composite artefacts. They produce bespoke designs for a small group of users, but are, or aim for being, subject to vivid debate at times. In both fields, the notion of the laboratory is increasingly of interest; in space from the perspective of analogous settings for controlled testing, such as Sandal's et al. (2006) model of Antarctica as laboratory for crew interaction in space; in design to describe settings that do not conform with traditional studio arenas of design development, but venture into science and technology or participatory contexts (Koskinen et al, 2008; Latour & Woolgar, 1986; Antonelli, 2008). In light of the remote temporal, geographical and experiential nature of the space setting, the following laboratory concept borrows aspects of the virtual laboratory, or ‹collaboratory› (Academic Press Dictionary of Science and Technology, 1992).

To approach spaceflight through the critical design perspective, three particular areas are captured in this proposal. They concern qualities or outputs of critical design related to the definitions of Dunne & Raby (2001, 2008, and Dunne, 2005): (i) Pushing the lived experience to the limit; (ii) Exploring aesthetics of use and para-functionality; and (iii) Addressing latent psychological needs through speculative design or design fiction.

Three examples from space settings will be linked to these aspects: The ISS as collaborative design product in a hostile natural environment; physical interaction and manipulation of objects by astronaut in microgravity conditions; and the psychological dimension of an interplanetary mission.

## The International Space Station as Critical Design Artefact

The planners of the ISS may not have set out to create ‹critical design› when they started the project in the early 1990s. Nevertheless, the station may interpreted as such. With construction completed in 2010, the ISS would then arguably be the largest[5], heaviest[6], fastest[7], and most expensive[8] piece of critical design today. As a habitation system, it testifies to the great challenge of addressing the human factor in a technology project, but also embodies human values of curiosity, adventure and power. Comparing it to Dunne's and Raby's outline, it displays characteristics of oddity and ambiguity, it is non-affirmative but defying, challenging and ambiguous, it comments on pre-conceived notions, it is not ideal but reflects real human behaviour. Observed rationally, the ISS is in fact compellingly absurd and combines several dichotomies. While it is itinerant, it has no destination; it is endlessly falling towards, but never reaching, earth. Its exterior hull can be incapacitated by a small piece of debris, yet its inhabitants can manoeuvre objects in excess of their body mass. As a location it is relatively remote and logistically complex to reach, yet its absolute distance to the ground is less than the beeline from London to Berlin[9]. Only six individuals currently live there. Thus, for the majority of the population it remains a ‹product for the mind› (Dunne & Raby, 2001) that evokes awe and enthusiasm, disapproval and controversy.

### Challenging Gravity & Human Physiology

The ISS is literally pushing the limits of our lived experience beyond the border of our atmosphere, where human presence is as little genetically wired as in other extreme settings. However, through utilisation of existing natural resources, artificial technology or physical training humans can edge closer to naturally hostile environments they are not conventionally supposed to access or inhabit. In his act to ascent Mount Everest without the use of supplementary oxygen (Bonington, 1981), mountaineer Reinhold Messner essentially critiqued, and in the same process successfully defied, the physiological reality of his lungs, cardiovascular system and brain in high altitude. Similarly, the ISS critiques and defies not only human physiology (which is not intended for exposure to low pressure, radical temperature fluctuations, radiation or lack of oxygen) and physics (gravity), but equally the economical and political realities of a post cold war global state of affairs.

### Challenging Politics

Already with preceding space stations, Beaudrillard proclaimed the «end of science fiction» (1981). In the ISS, human values of global cooperation and the pursuit of science and exploration of the solar system are manifested into an object – which, re-adjusting the concept of science fiction as per Dunne's definition (2005) could be called value fiction. While the motivations and ideological aspirations of the 22 international partners were manifold, the product of their efforts reflected the complex political and infrastructural realities after the cold war. Before that, the Apollo programme was described as the «last optimistic act of the twentieth century» (Smith, 2005). If optimism is expressed in resilience, then the MIR space station was equally optimistic as a piece of hardware when it braved fires, collision, and financial constraints during the collapse of the Soviet Union long beyond its use-by date. The ISS may be optimistic, but cannot be described as affirmative. The aim of its construction was not to reflect the contemporary cutting edge of technology or an ideally designed habitat. On the contrary, the station core was constructed from spare hardware components of the preceding Russian and US space programmes (Hendrickx, 2002) – ‹found objects›, if you will, in design terminology. This ‹collage› of technology snapshots from the past decades was incrementally modified and extended. What started as «imagination in practice» (Hall, 2002) is now a routine ruled by the «everyday grind of repair, construction, experiment and resupply» (ibid) but reflects the *reality* of spaceflight. This reality also consists of an unprecedentedly large-scale exercise of building and inhabiting a structure that physically and operationally transcends traditional nation states. It juxtaposes differing design philosophies, including those of the two original space-faring nations of Russia and the US, while continually

5 *110mx60m (Encyclopedia of 20th Century Technology, 2005).*

6 *Approximately 370000kg (ESA, 2008).*

7 *Average speed approx. 27700km/h (Hall, 2002).*

8 *US$90 billion (The Hutchinson Unabridged Encyclopedia, 2009).*

9 *Average altitude 350km (ibid).*

demonstrating the everyday difficulties of this symbiosis in terms of having to overcome hardware or language compatibility issues (Burrough, 1998; Kanas & Ritsher, 2005).

### How Not to Design a Flat-Share

The ISS highlights and exaggerates boundaries of human-human and human-technology interaction. In terms of configuration and amenities, it should be the epitome of a non-ideal co-habitation context for high-profile professionals. The view outside is extraordinary, but the station interior is spiky and cluttered. The crew eat out of cans, drink their own processed urine, are exposed to significant noise and other occupational hazards, and have to don heavy equipment to egress. Habitation modules were axed for cost reasons (Nixon, 2010), and until recently there were no designated private quarters for each individual crew-member. Crammed with sensitive payloads covering not just the walls, but also the equivalents of floor and ceiling, the facility is geared for work. Atmospherically, it has been likened to a high tech ‹camper van› (Yi, 2009) with an aim of odour-neutrality (Holland et al., 2004) for a recycled breath of air. Yet, although it features few of the qualities associated with a comfortable home, the great majority of astronauts and cosmonauts grow to settle in well and frequently get attached to their temporary residence (Cooper, 1977; Ritsher et al., 2007).

Forced by hostile yet beautiful surroundings to essentially live inside a machine, the daily life of space station inhabitants reflects the dialectics of human behaviour. While astronauts and cosmonauts primarily conduct tightly scheduled experiments and perform scripted public outreach duties, they also cherish the pea-saplings in a plant growth facility (Zimmerman, 2003), spend hours gazing out of the window, or stay up late tinkering in their orbital workshop.

## The Astronaut as Designer: Aesthetics of Use in Microgravity

The facets or a routine become most obvious in long duration missions when strict planning gives way to more personal downtime, control and flexibility. The more latent idiosyncrasies and opportunities of life in orbit become apparent.

### Building & Making

The inhabitants of a station intimately know their habitat, not only in the interest of safety, but also because it is essentially they who construct and maintain it. They are what Koolhaas calls the unified ‹producer and user› (Steele, 2009) of a particular piece of architecture. No matter whether they have military, medical, natural science or various engineering backgrounds, astronauts and cosmonauts take part in the design process by assembling trusses, deploying modules and payload racks. Pre-flight, as part of their active careers or upon retirement from the astronaut corps, they work at the drawing board (Hall et al., 2003); post-flight or in between missions, they amend and write software for PDAs in orbit, suggest re-configuration of their suits, or come up with new concepts for hardware based on their own experience[10]. The Russian cosmonaut and mechanical engineer Sergei Krikalev, who has spent the longest accumulated time in space, highlights the role of human resourcefulness in opposition to direction through automation of the space vehicle or centralised mission control (2008). In future autonomous missions strong familiarity with the onboard systems will be crucial (Aguzzi et al., 2008) and casual manipulation of hardware would become an asset.

10 *e.g. Thomas Reiter, Jean-Francois Clervoy and Wubbo Oeckels of ESA.*

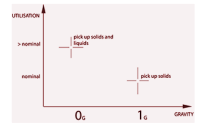
### DIY, Tinkering & Hacking

Some of the most playful design activity must, then, be Don Pettit's Saturday Morning Science. The astronaut, a chemical engineer by training, spent 161 days on ISS in 2002/03 (Shayler & Burgess, 2007) and conducted dozens of informal experiments that he recorded on video. From small wire loops holding food-dyes to contraptions from portable CD players, Pettit's work exposes both the unique dynamics of materials and objects in microgravity conditions, but also the dual, multiple or para-use of onboard provisions. One of his more complex in-situ constructions was a special camera to crisply document cities at night from orbit. He compensated for the movement of his itinerant viewpoint – which caused the blur he sought to avoid – by means of a spinning power drill. «We always use the right tools for the job', he remarks wielding duct tape and plastic pouches, «which at a frontier is any tool you can find» (Pettit, 2003).

### Value as a Function of Gravity

One strikingly simple insight, however, is demonstrated during a sequence shot at dinner, in the course of which Pettit picks up stray spheres of water from the air in front of him using chopsticks. The function of this basic eating utensil – and therefore its potential use and, perhaps, value – is radically transformed by the change of the parameter of gravity. What can be discovered about objects and our relationship to them if they are subjected to altered gravity conditions? What is to be observed already is an enormous impact on housekeeping, and scanning and identification technologies find wide application in space for content management and retrieval (NASA, 2010). For the designer interested in the integrated system of users and their environment, microgravity presents a unique experimental medium. When dislodged from their surroundings, objects are equipped with a whole new layer of movement and function.

*Figure 2* →**X**
*The changing potential of the usability of a pair of chopsticks when the parameter of gravity is changed.*




### Practical Jokes

The spectrum of activity of the astronaut as designer or author of design interactions is wide. On its periphery sit practical jokes that involve objects – for instance the plastic cucumber that Salyut cosmonauts placed in an orbital plant growth facility, in order to tease the ground-based botanical investigators, or the fake extra-cosmonaut they constructed from an empty spacesuit and spare cables, who ‹knocked› on a hatch with a pre-recorded voice-over and entered the module during a television broadcast (Zimmerman, 2003). Many cosmonauts would like to pursue their own science or DIY projects on long duration missions (Padalka, 2009). Humour or producing artefacts for others

from scratch will be invaluable in a remote, inaccessible location – not only to extend the lifecycle of equipment and solve maintenance problems, but to entertain, edify and pass the time.

## Extended Exploration Missions and Speculative Design for the Human Condition

Future extended exploration missions in the framework of several years will push this orbital experience to the limit. Autonomous spacecraft will host the micro-society of a hand-full of crew-members over a timeframe of years, disconnected from channels of resupply, abort or rescue, with limited possibility for communication, and the earth shrinking to coin-size in the rear window against an infinite black (Winisdoerffer & Soulez-Larivière, 1991).
With long stretches of low workload (Bishop, 2006), the psychological stressors that distinguish such exploration missions from orbital long duration stays particularly include social, spatial and sensory isolation. In such a mission, psychosocial factors become essential considerations and include issues of safety and risk perception, boredom, stimulation, communication, depression, spirituality, desire and loneliness, enthusiasm, mortality, responsibility, hierarchy and individuality, amongst others (Connors et al. 1985, Stuster, 1986; Harrison, 2001). These are concrete concerns in this setting, but equally pertain to a much larger inventory of universal human experience, embedded in the context of extreme isolation.

### The Mission Scenario as Petri-Dish for Needs & Values

The magnification of these issues, coupled with a quasi-closed habitation system, render such mission settings a petri-dish in which to observe the human condition reduced to its basics. There are a host of what can be described as «new or neglected psychological needs that are often intellectual [yet] real and genuine» (Dunne & Raby, 2008). These needs, wishes and desires cannot be predicted, «for they are hierarchical, nonlinear, time-bound and inherently conflicted» (Sterling, 2005). Hierarchical in their physicality, like Pettit illustrates: «If the toilet doesn't work on station, all halts» (Pettit, 2009). Non-linear, as they include «unpredictable urges» (Sterling, 2005) whose satisfaction is constrained by material and emotional availability of resources of peers. They are time-bound, like the «third quarter phenomenon» (Bechtel & Berning, 1999) that indicates when morale is likely to be lowest during a mission. And they are inherently conflicted, between the crew-members themselves, or between ground and a crew that might develop their own subtle agendas and values over a period of elapsed mission time (Dudley-Rowley et al., 2003). Science fiction has produced a body of thought and designs on many of these issues relating to the «complex, troubled people» described by Dunne and Raby. Design fiction offers the opportunity to explore these kinds of social interaction (Bleecker, 2009), especially if the constituent components of a scenario – situation, action and consequence (Liotta & Shearer, 2007) – are addressed. Particularly sinister, romantic or mundane issues have intrigued writers, directors and audiences most, but are frequently rooted in realities of space or other extreme environments (Stuster, 1986; Harrison, 2001). The questions we can begin to address in a studio-based exercise using an extended mission scenario as reference constitute the tip of the iceberg of the human psyche. Designing for them then helps to humanise the setting (Dunne & Raby, 2008) through physical hypotheses (Overbeeke, 2007). Two examples are outlined in the following.

### The Dead Body Question

If the question of fatality, for instance, is addressed through the design of a fictional interaction or system, not only logistical and organisational issues such as mission success and crew morale, skill replacement and redundancy, autopsy or storage requirements, or contamination risks will be encountered. For a truly meaningful and comprehensive response the designer would have to dive into a well of ethical and moral implications equally and increasingly applicable also in a terrestrial context, that not only address the consequences of a fatality, but also pre-empt or anticipate it. These may include prophylactic genetic screening, select-out criteria, enhancement, human integrity and identity, and the value of individual lives. One of the potentially inflammatory issues in such an exercise is the low threshold to shrewd or even cynical design, which in a space context is amplified by acute design drivers of physical survivability and mission success. Nevertheless, these drivers render the setting extremely stark and therefore potentially prolific as a model.

### Value as a Function of Distance

Similar multiple implications can be raised through other issues, for instance in relation to personal values. If there are severe constraints in terms of mass and volume, and the transport of 1kg of cargo only into Lower Earth Orbit already costs around $ 9 500 (Sietzen, 2001), what should be brought? Plotting terrestrial human needs and wants against the pack lists of contemporary cargo supply ships[11] could be an interesting exercise in prioritising and editing personal possessions. Once genuine needs and wants are revealed, questions can be posed regarding our personal perception and attribution of values, be they tangible or related to experiences. For instance, imagining forms of remote, non-verbal personal communication for a mission where real-time exchange is impossible may offer insightful commentaries or interventions for the increasing sense of dislocation and loneliness (Griffin, 2010) in a technologised society today.

## Practical Issues for Space Design Fiction

Space scenarios as laboratory can be implemented as abstract thought-experiment or hands-on studio activity. In order to get an incisive view, a degree of knowledge about the setting is required. Knowledge, here, does not necessarily imply expertise. Empathy or an understanding of the idiosyncrasies of the space environment and the appreciation of its subtleties are, however, essential if one's goal is to pull the focus back onto a terrestrial context with meaningful insights or questions. The set-up of simulating an inaccessible setting as laboratory to gain insight into a real condition results in a somewhat layered model (Fig. 3).

*11 Such as the European, Japanese, Russian unmanned transporters Automated Transport Vehicle, H-II Transport Vehicle and Progress. Cargo supply chains in deep space would be much more restricted.*

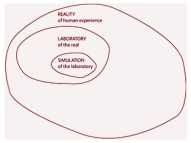



*Figure 3*→**x**
*The layered relationships of the simulated space settings as laboratory for real conditions.*

## Operational Immersion

This understanding can be achieved through several channels. Preliminary familiarisation with the published body of anecdotal evidence will be conducive to ethnographic research efforts (Connors, 2009). Accounts such as these also provide raw data to create initial fictional personas (Nielsen, 2002).
Of particular use will be a personal experience of some form. Collaboration or other types of practice in the area of space operations and research promote an understanding of applied design and the motivations of different stakeholders. It also sharpens insight on one's own practice in relation to other disciplines (Mazé, 2009). Space analogous settings aim to recreate physical or psychological conditions. Aspects of both are united in the so-called bed rest study, where participants experience some of the less pleasant physiological effects of reduced gravity coupled with a long stretch of bed-bound boredom in the confines of a medical clinic. Overwintering in an Antarctic research station requires significant personal, professional and scheduling commitments but presents an opportunity to experience a space analogous environment that, from a purely rescue and abort related perspective, can only be surpassed by submarine habitation such as the NASA-operated NEEMO facility.

## Low-Fidelity Simulation

Space mission simulations, especially long duration isolation studies such as Mars500, are what Eco would call «authentic fakes» (1967). This authenticity requires a significant amount of resources. In return, simulations offer a low-risk setting for research, more accurate evaluation of a concept, lower cost, increased safety and closer user interaction than the real world (Mohanty et al, 2009; Baranov 2001). Many designers with a technical or industrial background and specific language skills would be basically qualified as subjects in isolation studies. Participation with the purpose of elicitation of design information might constitute what Miller and Tewksbury summarise as «extreme methods» (2001).
For a quick-and-dirty design exercise, such simulations frequently require too long a lead-time to arrange. However, if a certain type of technology, or in this case infrastructure, is not available, this does not mean there should be no engagement with it (Dunne & Raby, 2008). Several low fidelity simulation methods were tried throughout and before the study in relation to reduced gravity conditions and isolation. They may rely on an initial investment into networks or equipment, but can be implemented relatively cheaply and quickly. When parabolic flights[12] or neutral buoyancy tanks – for powerful impressions of reduced gravity conditions – are unavailable, submersion in ordinary pool facilities can impart a rudimentarily similar experience. An alternative for physical interaction was tested by constructing full-scale inflatable mock-ups of objects from ultra-light Mylar® and filling these with commercially available helium. In lieu of visiting the ‹Antarctic laboratory› mentioned earlier, remote subarctic settings in North Scandinavia, or large cave systems or mines, display comparable extreme daylight conditions. Potentially useful ethnographic data on interaction was also extracted through telephone interviews with inhabitants of geographically and socially isolated monastic contexts, and through written and photographic user diaries of popular musicians confined to touring vehicles over long stretches of time.

12 as non-scientists (Triscott & La Frenais, 2005)



*Figure 4*→**x**
*Visiting habitable snow structures during in Swedish Lappland during polar winter; construction of a Tetris-style inflatable prototype.*

# Conclusion

Spaceflight settings present unique reduced but open-ended laboratory conditions. They may not be accessible to the designer today, but can be modelled to some extent. Designing these scenarios sheds new light onto terrestrial human values and interactions. When they eventually take place, future extended missions will no doubt turn out to be as complex as other comparable human experiences; the notion of the ‹laboratory› is then transformed into a ‹field› setting.
To the observer, it might seem premature to suggest an augmented form of design inquiry in or through a field that has only just begun to surpass the era of a ‹man-in-a-can› philosophy. In fact, however, space design as a topical field is perhaps especially of interest from a critical perspective as it has always been bespoke and directed at a small group of non-consumer users. It is timely to look at its extended potential now, particularly in view of the current bifurcation of space artefacts from the classic path of exclusive hardware for a professional audience into a parallel route towards the branding and consumer-oriented realm of private sub-orbital spaceflight.
As future extended missions are both temporally, spatially and possibly also intellectually removed from our perspective as designers today, the boundaries between real or fictional products for such settings are flux. This paper is intended as preliminary manual for engagement in critical design activity in space, both for the space systems developer interested in expanding their foresight repertoire, and the speculative designer looking for an additional extreme platform.

# References

*Academic Press Dictionary of Science & Technology (1992). ‹collaboratory›. Elsevier Science & Technology, Oxford, United Kingdom, Retrieved August. 22. 2010, from http://www.credoreference.com/entry/apdst/collaboratory.*

*2001: A Space Odyssey (1968). [film] Directed by Stanley Kubrick. US/UK: MGM.*

*Aguzzi, M., Bosca, R., & Muellerschkowski, U. (2008). Astronaut Training in View of the Future: A Columbus Payload Instructor Perspective. IAC-08-B3.3.37, Proceedings of the 59th International Astronautical Congress, October 2008, Glasgow, UK.*

*Alien (1979). [film] Directed by Ridley Scott. US: Brandywine Productions.*

*Antonelli, P. (2008). Design and the Elastic Mind. New York: Museum of Modern Art.*

*Baranov, V. M. (Ed.) (2001). Simulation of Extended Isolation: Advances and Problems. Moscow: Slovo.*

Baudrillard, Jean (1981:2010). Simulacra and Simulation. Ann Arbor: University of Michigan Press.

Bechtel, R. B. & Berning, A. (1991). The third quarter phenomenon: do people experience discomfort after stress has passed? In A. A. Harrison, Y. A. Clearwater & C. McKay (Eds.) From Antarctica to Outer Space. (pp. 261-266). New York: Springer.

Bishop, S. (2006). Psychological and Psychosocial Health and Well-being at Pole Station. In Cockell, C. (Ed.), Project Boreas: A Station for the Martian Geographic North Pole (pp. 163-168). London: British Interplanetary Society.

Blauvelt, A. (2010). Towards Relational Design. Design Observer, March 11, 2010. Retrieved April, 1, 2010, from http://www.designobserver.com/observatory/entry.html?entry=7557.

Bleecker, J. (2009). Design Fiction: A Short Essay on Design, Science, Fact and Fiction. March 17, 2009. Retrieved April 1, 2010, from http://www.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction.

Bonington, C. (1981). Quest for Adventure. London: Hodder & Stoughton.

von Braun, W. (1971:2006). Project Mars: A Technical Tale. Burlington: Apogee.

Dark Star (1974). [film] Directed by John Carpenter US: Jack H. Harris Enterprises.

Carroll, J. M. (Ed.) (1995). Scenario-based design. New York: Wiley & Sons.

Clarke, A. C. (1972:1984). Report on Planet Three and Other Speculations. London: Pan Books.

Connors, M. M. (2009). Personal Communication. August 24, 2009, Mountain View, CA.

Connors, M. M., Harrison, A. A. & Faren, R. A. (1985). Living Aloft – Human Requirements for extended Spaceflight. Washington: NASA.

Cooper, A. (2004). The Inmates are Running the Asylum. Indianapolis: Sams.

Cooper, H. S. F. Jr (1977). A House in Space: The First True Account of the Skylab Experience. London: Granada Publishing.

Doroga K Zvezdam (1955) [film] Directed by Pavel Klushantsev. USSR: Leningrad Popular Science Film Studio.

Dudley-Rowley, M., Okushi, J., Gangale, T., Flores, P., & Diaz, E. (2003) Design Implications of Latent Challenges to the Long-Duration Space Mission, Proceedings of the AIAA meeting in Long Beach, California, 24 September 2003.

Dunne, A. (2005). Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design. Cambridge, MA/London: MIT Press.

Dunne. A. & Raby, F. (2008). Fictional Functions and Functional Fictions. In C. Freyer, S. Noel, & E. Rucki (Eds.), Digital By Design: Crafting Technology for Products and Environments (pp. 264-267). London: Thames & Hudson.

Dunne, A. & Raby, F., (2001). Design Noir: The Secret Life of Electronic Objects. Basel: Birkhäuser.

Eco, U. (1967:2010). Travels in Hyperreality. Fort Washington: Harvest Books.

Encyclopedia of 20th Century Technology (2005). Space Stations, International Space Station. London: Routledge. Retrieved August 22, 2010, from http://www.credoreference.com/entry/routt/space_stations_international_space_station.

ESA (2008). About the International Space Station. June 26, 2008. Retrieved July 10, 2010, from online http://www.esa.int/esaHS/ESA6NEOVMOC_iss_0.html.

Fischer, V., (2004) Designing the Future: On Pragmatic Forecasting. In Deutsches Filmmuseum and Deutsches Architekturmuseum (Eds.) 2001: A Space Odyssey Odyssey – Exhibition Catalogue, (pp. 102-119).Frankfurt am Main: Schriftenreihe des Deutschen Film.

Griffin, J. (2010). The Lonely Society? London: Mental Health Foundation.

Häuplik-Meusburger, S., Aguzzi, M. & Peldszus, R. (2009). A Game for Space. Acta Astronautica. Vol 1-2, 2010, 605-609.

Häuplik-Meusburger, S., Peldszus, R. & Enholz, V. (2009). Greenhouse Design for Long Duration Spaceflight. Proceedings of the 60th International Astronautical Congress, October 2009, Seoul, Korea.

Hall, R. (Ed.) (2002 and 2005). The International Space Station: From Imagination to Reality. Vol 1 & 2. London: British Interplanetary Society.

Hall, R., Shayler, B. & Vis, K. (2003). Russia's Cosmonauts: Inside the Yuri Gagarin Training Center. New York: Springer.

Harrison, A. A. (2001). Spacefaring: The Human Dimension. Berkely: University of California Press.

Harwood, W. (2010). Current Space Demographics. April 29, 2010. Retrieved July 20, 2010, from http://www.cbsnews.com/network/news/space/democurrent.html.

Hendrickx, B. (2002). From Mir-2 to the ISS Russian Segment. In R. Hall (Ed.) The International Space Station: From Imagination to Reality. (pp 3-44). Vol 1 & 2. London: British Interplanetary Society. van Hinte, E. & van Tooren, M. (2008) First Read This: Systems Engineering in Practice. Rotterdam: 010 Publishers.

Holland, F., Dalke, H., Matheson, M., Stott, L. & Welch, C. (2004). Olfactory Environment Control Systems for Crewed Spacecraft, IAC-04-IAF-G.P.10. Proceedings of the 55th International Astronautical Conference, Space Life Sciences in the 21st Century, 4-8 Oct 2004, Vancouver, Canada.

Hutchinson Unabridged Encyclopedia (2009) International Space Station. Abington: Helicon. Retrieved August 22, 2010, from http://www.credoreference.com/entry/heliconhe/international_space_station.

Kanas, N. & Manzey, D. (2003). Space Psychology and Psychiatry. Dordrecht: Kluwer Academic Publishers; and El Segundo: Microcosm.

Kanas, N. & Ritsher, J. (2005). Leadership issues with multicultural crews on the international space station: Lessons learned from Shuttle/Mir. Acta Astronautica 56, 932-936.

Koskinen, I., Binder, T., & Redström, J. (2008). Lab, Field, Gallery, and Beyond. Artifact: Journal of Virtual Design, 2(1), 46-57.

Krikalev, S. K., Kalery, A. Yu., & Sorokin, I. V. (2008). Crew on the ISS: Creativity or Determinism? Proceedings of the 59th International Astronautical Congress, October 2008, Glasgow, UK.

Larson, W. J. & Pranke, L. K. (1999) Human Spaceflight Mission Analysis and Design. New York: McGraw Hill.

Latour, B. & Woolgar, S. (1986). Laboratory Life: The Construction of Scientific Facts. Princteon: Princeton University Press.

Liotta, P., & Shearer, A., (2007). Gaia's Revenge: Climate Change and Humanity's Loss. Westpost: Praeger.

Margenau, H. (1950). The Nature of Physical Reality. New York/London: McGraw-Hill.

Mazé, R. (2009). Critical of What? In M. Ericson (Ed.) Iaspis Forum on Design and Critical Practice. (pp. 379-398). Berlin: Sternberg Press.

Miller, J. M. & Tewskbury, R. (Eds.) (2001). Extreme Methods: Innovative Approaches to Social Science Research. Boston: Allen and Bacon.

Mohanty, S., Fairburn, S. M., Imhof, B., Ransom, S. & Vogler, A. (2009). Human-Space-Mission Simulators. In A.S. Howe & B. Sherwood (Eds.) Out of this World: The New Field of Space Architecture. (pp. 333-354). Reston, VA: American Institute of Aeronautics and Astronautics.

Moon (2009) [film] Directed by Duncan Jones. UK: Liberty Films.

NASA (2010). Human Integration Design Handbook (HIDH): Baseline – January 27, 2010. NASA/SP-2010-3407. Washington, D. C., NASA.

Nielsen, L., (2002). From user to character: an investigation into user-descriptions in scenarios. Proceedings of the 4th conference on Designing interactive systems. Processes, Practices, Methods, and Techniques. (pp. 99-104). New York: ACM, New York.

Nixon, D. (2010). International Space Station. Building Design Online, June 4, 2010. Retrieved July 17, 2010, from http://www.bdonline.co.uk/buildings/international-space-station/5000525.article.

Overbeeke, K. (2007). The Aesthetics of the Impossible: Inaugural Lecture. October 26, 2007. Eindhoven: Technische Universiteit Eindhoven.

Padalka, G. (2009). Personal Communication. Downlink ISS – Canadian Space Agency, July 2009, Mountain View, CA.

Peldszus, R., Dalke, H., Welch, C. (2010). Science Fiction Film as Design Scenario Exercise for Psychological Habitability: Production Designs 1955-2009 (AIAA 2010-6109). Proceedings of the 40th International Conference on Environmental Systems (ICES), Barcelona, Spain, 11-15 July 2010. Reston, VA: American Institute of Aeronautics and Astronautics.

Pettit, D. (2003). Expedition Six: Opening a Can of Honey. [video] March 15, 2003. Retrieved December 2, 2009, from http://spaceflight.nasa.gov/gallery/video/station/expedition6/qtlow/waterscience.mov.

*Pettit, D. (2009). Personal Communication. July 21, 2009, Mountain View, CA.*

*Riley, F. E. & Sailor, J. D. (1962). Space Systems Engineering. New York: McGraw-Hill.*

*Ritsher, J.B., Kanas, N. A., Ihle, E. C. & Saylor, S.A. (2007). Psychological adaptation and salutogenesis in space: Lessons from a series of studies. Acta Astronautica, No 60, 336-340.*

*Robach, C. (2005). Critical Design – forgotten history or paradigm shift? In M. Sarstad, & H. Emanuelsson (Eds.) Shift: Design as usual – or a new rising? Stockholm: Arvinius Förlag.*

*Robinson, D. K. R., Sterenborg, G., Häuplik, S., and Aguzzi, M. (2008). Exploring the challenges of habitation design for extended human presence beyond low-earth orbit: Are new requirements and processes needed? Acta Astronautica, 62, 721-732.*

*Rummel, J. D. (1992) Development of Life Support Requirements for Long-term Space Flight. Advances in Space Research 12(1) 351-353.*

*Sandal, G.M., Leon, G.R., & Palinkas, L. (2006). Human challenges in polar and space environments. Reviews in Environmental Sciences and Biotechnology 5(2-3), 281-296.*

*Shayler, D. J., & Burgess, C. (2007). NASA's Scienist-Astronauts. New York: Springer Praxis.*

*Sietzen, F. (2001). International Space Transportation Association Faltering: The myth of $10 000 per pound. March 18, 2001. Retrieved August 22, 2010, from http://www.spaceref.com/news/viewnews.html?id=301.*

*Smith, A. (2005: 2006). Moon Dust: In Search of the Men Who Fell to Earth. London: Bloomsbury.*

*Solodilova-Whiteley, I. (2007). Summary Report: Tools for Psychological Support for Long-duration Exploration Missions. SEA/07/TN/6415. Frome: SEA.*

*Steele, B. (2009). Super-Critical: Peter Eisenman & Rem Koolhaas. London: Architectural Association.*

*Sterling, B. (2005). Shaping Things. Cambridge, MA: MIT Press.*

*Stuster, J. W. (1986). Space Station Habitability Recommendations Based on a Systematic Comparative Analysis of Analogous Conditions. Washington, D.C.: NASA.*

*Suedfeld, P. & Steel, G. D. (2000). The Environmental Psychology of Capsule Habitats. Annual Review of Psychology. 51, 227-253.*

*Triscott, N. & La Frenais, R. (2005). Zerogravity: A Cultural User's Guide. London: Arts Catalyst.*

*Winisdoerffer, F. & Soulez-Larivière, C. (1991). Habitability Constraints/Objectives for a Mars Manned Mission: Internal Architecture Considerations. Advances in Space Research 12(1) 315-20.*

*Yi, S. (2009). Personal Communication. July 21, 2009, Mountain View, CA.*

*Zimmerman, R. (2003). Leaving Earth: Space Stations, Rival Superpowers, and the Quest for Interplanetary Travel. Washington: Joseph Henry Press.*

*Zukowsky, J. (1999). Space Architecture: The Work of John Frassanito & Associates for NASA. Stuttgart/London: Edition Axel Menges.*

Betti Marenko Central Saint Martins Collegeof Art & Design,

University of the Arts, London, b.marenko@csm.arts.ac.uk

# Contagious Affectivity.
## The Management of Emotions in Late Capitalist Design

Keywords: Affect, emotion, contagion, postfordism, hacking

I am investigating the notion of affect as elaborated by Baruch Spinoza and, drawing from Spinoza, also by Gilles Deleuze and Brian Massumi, who have written extensively about this subject in relation to the constitution of subjectivities. The general framework I am following is given by the critique of current forms of capitalism, which I am inclined to rename semio-chemio-neuro-affective capital. This term underlines the coagulation of different levels of production, reproduction and control concerning regimes of signs, circulation of knowledge and affects, language and desire, the chemical and neurological composition of subjectivities and so on. I see here a progression from my previous work on how the production of subjectivities within a biopolitical/affective framework is mediated by psychopharmaceutical technologies (Marenko 2009a) and on the emotional entanglement that characterizes our relationship with objects, which I have reframed within a neo-animist paradigm (Marenko 2009b). I argue that we cannot look at design without first addressing how emotion itself is being designed as labour within the current new spirit of capitalism. In this sense the increasing emphasis on emotion in design reflects and reinforces what is currently at the core of late capitalism, that is, the shift to affect, knowledge, information and experience, what Italian Marxist theorists (Maurizio Lazzarato, Christian Marazzi, Antonio Negri, Paolo Virno) define as immaterial labour. Against this backdrop I refer to Eva Illouz's notion of emotional capitalism and Bernard Stiegler's ideas of psychopower and the capture of attention, as well as to Deleuze's ideas on modulation and control. My intention in this paper is first to map the territory of what we mean by affect, as distinct from emotion (Deleuze, Massumi). The notion of an affective turn in the social sciences will be addressed (Patricia Clough). Then I will look at the transmission of affect (Teresa Brennan) by invoking an epidemiology paradigm (Gabriel Tarde) and ideas of social contagion and viral spreading. Finally I will position these ideas in relation to designed objects and the process and practice of design, specifically in relation to what is known as emotion- driven design.

*The constitution of a psychopolitics reaffirming itself as a noopolitics through the technologies of the spirit is the major stake in a reorganisation of capitalism (Stiegler 2008)*

*Marketing is now the instrument of social control (Deleuze 1995)*

*People love to entrain (Thrift 2008)*

## Introduction

My intention here is to problematize the relationship between design and emotion by suggesting a framework based instead on the idea of affect. I argue that any discussion on design should be firmly placed within the wider framework of the current transformations of late capitalism and its concern with modes of control of, and engagement in, the affective sphere. This means reconsidering the production of value as inherent to life itself and its potential for experi-

ence, entertainment, emotion and enjoyment. A key point is that value is now extracted from, and created by, the interception, modulation and mining of pre-individual affective capacities.
My reflection on the field of design and emotion aims at both unpacking its ideological underpinning and locating it firmly within the above described broader affective realm. I would like to start from the premise that *all* design has to do with intensities and affects circulating among the stakeholders: objects, designers, users, as well as contexts. This position is predicated upon the central tenet that designed objects are always meaning-making machines and the emotions elicited cannot but be intrinsically and utterly relational.

## Critique of the current view of design and emotion

The current literature on the relationship between design and emotion, a research field formalized in 1999 with the First International Conference on Design and Emotion (Delft University of Technology) and the foundation of the Design and Emotion Society in the same year, is rooted in a cognitive and functionalist approach and seems driven by the intention to define, categorize (Jordan 2000), and quantify (Desmet 2004) emotions. This has generated some interesting outcomes, but also some equally interesting and eloquent criticism (Demir 2008, Kurtgozu 2003, Savas 2008, Yagou 2006). The main critique is that the prevailing framework is reductionist as it focuses on a narrow understanding of emotions, products and users, as if emotions were something extra that can be *designed into* a product as an added value, disregarding the fact that emotions are always context-based and, as said above, utterly *relational*. Furthermore, within the field of design and emotion there seems to be a general agreement on the fact that, far from being understood and distinguished from other states, emotions are elusive, intangible and difficult to define (Desmet 2004, Desmet *et al.* 2008, McDonagh *et al.* 2004).
Donald Norman (2004) is one of the few who distinguishes between affect and emotion. While affect is what gives us the capacity to discern and make judgements for our survival (and includes emotions), emotion is «the conscious experience of affect, complete with attribution of its cause and identification of its object» (Norman 2004, 11). Elsewhere (Desmet and Hekkert 2007) the terms ‹affect› and ‹experience› are used interchangeably, underlying the fact that any product experience is inherently affective.[1] This seems to be a contentious issue, as all design can be said to be ultimately about eliciting emotional response. In this light, even the modernist narrative, often represented as predicated upon lack of emotion, is revealed as a machine-based fiction eschewing its complex affective engagement with the user (Yagou 2006). Another point has to do with the narrow, even trivial, concerns of the design and emotion field, which seems myopically and stubbornly engaged with measurement and taxonomy (Yagou 2006). Indeed, even though Pieter Desmet acknowledges that «the emotional aspects of a design can be difficult to discuss because they are often based on intuition» (Desmet 2004, 121); that «little is known about how people respond emotionally to products and what aspects of design or interaction trigger emotional responses» (Desmet 2004, 111); and that it is «surprisingly difficult to come with a solid definition» for emotion (Desmet 2004, 112), he has elaborated a well-known method of measurement.[2]
Finally, the design and emotion field postulates a hierarchy of consumer needs (inspired by Maslow's hierarchy of needs). Jordan (2000), for instance, argues that following the satisfaction obtained at a functional level, «people will soon want something more: products that offer something extra; products that are not merely tools, but living objects that people can relate to; products that bring not only functional benefits but also emotional ones» (Jordan 2000, 6). This point reinforces the assumption that, as products become increasingly similar in technical terms and performance, the only way to distinguish them in a crowded market is by eliciting emotional and experiential responses (Desmet 2004, Norman 2004). However, as Savas (2008) has shown, this is grounded on a disassociation between emotions and fulfilment of needs which does not take into account the complex variability of material and social conditions of existence, surely affecting the emotional engagement with, and responses to, the world of designed objects. This divorce between emotions and functions risks to thin out the design and emotions debate and turn it into another market-driven catchphrase for the elite consumption of luxury commodities.
To sum up, the notion that emotional value can be added to a product to increase its appeal is unconvincing, as it does not account for the affective sphere within which emotions are produced and circulate. Moreover, it fails to consider the extent to which affects enter into the composition of subjectivities which are continuously negotiated in relation to the encounters with human and non-human agencies (objects, bodies, people, events, things). In other words, emotions cannot be located *in* objects. Rather, they emerge out of the very relationality among stakeholders and the variable contexts involved. This is also the position of sociologist Sara Ahmed (2004) for whom emotions are first and foremost relations (hence belonging to neither the subject nor the object), which, literally, shape our bodies by leaving the traces of their passage imprinted onto our corporeal surface.[3]
The same can be said of experience. If experience is an always emerging, negotiable, contingent, situated relation, this implies that «we cannot design an experience. But with a sensitive and skilled way of understanding our users, we can design *for* experience» (Wright *et al.* 2004, 52).
I would argue that probing into notions of affects could offer significant benefits to any investigation on design. In what follows, I address the philosophical roots of affect and outline a discussion of the circulation of affects in contemporary capitalism.

## The affective turn

In his introduction to ‹The Affective Turn› (Clough 2007) Michael Hardt considers the current interest in affect found in critical theory. Tellingly, the title of his essay asks precisely what affects are good for, and in so doing offers indica-

*1 Desmet and Hekkert use the model of Core affect theory to map the multifaceted range of experience emerging from user-product interaction, which includes subjective feelings, behavioural reactions, expressive and physiological reactions.*

*2 PrEmo (Product Emotion Measurement), a non verbal self-report instrument based on cartoon faces that measures 14 emotions often elicited by product design (Desmet 2004, 114).*

*3 Ahmed's work on the relation between emotion, body sensation and cognition draws from Descartes, Hume and James. The idea that emotions are tied up mainly to bodily sensation is also argued by neuroscientist Antonio Damasio. He says: «emotions play out in the theater of the body, feelings play out on the theater of the mind» (Damasio 2003, 28). Hence, while emotions are actions or movements, feelings are always hidden.*

tions as to the possible links between this (renewed) interest in the affect-scape and various other, including, I argue, design, which would benefit from being reconceptualised through the framework of this paradigm. What is certain is that the relevance of affects in contemporary media, art and critical theory is growing (Clough 2007, Massumi 1996 and 2002).

One of the most radical aspects of the centrality of affects concerns the synthesis it requires. Affects engage body and mind, reason and passions. They have to do with «both our power to affect the world around us and our power to be affected by it» (Hardt, 2007 ix). Spinoza is the philosopher whose voice inspires and reverberates in the current concern with affects. It is to Spinoza that we should turn to investigate affect and, more generally, the relationship among bodies, objects and power. His claim that there exists a parallelism between body and mind, reason and passion, problematizes the way in which their relationship is thought of. In other words, it must be acknowledged and taken into account the correspondence between mind's power to think and body's power to act. Affects straddle the continuum of their relationship, indicating the current state of mind *and* body.

The scholar of passions, which he investigates with a rigorous geometrical method, as if they were lines, surfaces and bodies,[4] Spinoza never actually mentions emotions or feelings using instead the word affect (from the Latin *affectus*) to describe passions. He makes an important distinction between affections and affects. While affections are states of the body (effects of a body upon another body), affects are variations of the power of the body (effects of affections upon a duration).[5] So affects are first and foremost «the trace of one body upon another» (Deleuze 1988, 138), exactly as a body casts its shadow on another, and we can infer them both because of this shadow. But affects are also the ensuing variations in power from one state to another. This means that power and affectivity are strictly linked. Power is indeed «what opens up the capacity for being affected to the greatest number of things» (Deleuze 1988, 71). Finally, affective states are vectors each corresponding to a specific kind of knowledge and mode of existence.
For Spinoza, it is all a matter of encounters: an encounter is good when my relations are compounded and my powers increase (e.g. food); an encounter is bad when my relations are dissolved and my powers decrease (e.g. poison).[6] Any encounter is therefore always the encounter between different horizons of affectivity, that is, different states of transition in the power of bodies. Following Latour's notion of non-human agency (Latour 2005), we must intend these encounters as occurring among human and object.

It is precisely this philosophical framework that allows us to reconceptualise the relationship we entertain with the material world as affect-based. If on one hand this can help us to disentangle and clarify the often confused definitions

4 *See Ethics, III, 83.*

5 *For Spinoza, affects are «the modifications of the body by which the power of action of the body is increased or diminished, aided or restrained, and at the same time the ideas of these modifications» (EIIIDef3: 83).*

6 *Good and bad are «the two senses of variation of the power of acting: the decrease in power (sadness) is bad; its increase (joy) is good» (Deleuze 1988, 71).*



of affect and emotion, of which more later, on the other it also intends to locate the production and circulation of affects together with the production of the ‹immaterial› (codes, information, ideas, cognitive and creative labour) and to ground it within the broader perspective of postfordist forms of life. Thus, a reflection on the role of affect in the material world of designed objects concerns the epistemological shift from an economy of production and consumption to an economy based on the circulation of affects or intensities within the domain of biopolitical control. Indeed, any discussion of design, empathy and emotion should be placed within an affective theory of late capitalism (semio-chemio-neuro-affective capital), an «almost fragile mode of social organization, the perpetuation of which depends on the existence of hospitable life forms (e.g. bodies, subjectivities, social relations, material processes, desires, and fantasies)» (Vrasti 2008). Philosopher Brian Massumi warns:

*The ability of affect to produce an economic effect more swiftly and surely than economics itself means that affect is a real condition, an intrinsic variable of the late capitalist system, as infrastructural as a factory. Actually, it is beyond infrastructural, it is everywhere, in effect. Its ability to come secondhand, to switch domains and produce effects across them all, gives it a metafactorial ubiquity. It is beyond infrastructural. It is transversal. This fact about affect –its matter-of-factness needs to be taken into account in cultural and political theory. Don't forget. (Massumi 2002, 45).*[7]

## The difference between affect and emotion

As Massumi (2002) has remarked, we lack a consistently specific cultural and theoretical vocabulary to describe affect, too often used – wrongly – as a synonym for emotion.[8] While emotion is a subjective, qualified, recognisable intensity, «the socio-linguistic fixing» (Massumi 2002, 28) of a personal experience, affect is instead unqualified, pure intensity, neither ownable nor recognizable or measurable. Affect is the unactualized *capacity to* affect and be affected.[9] Affect is a prenarrative, preindividual intensity, akin to chaos theory's critical point when «a physical system paradoxically embodies multiple and normally mutually exclusive potentials, only one of which is ‹selected› » (Massumi 2002, 32).
To say that affect is a preindividual intensity means to shift from a subject-centred theory to an affect-based one, where the subject as we knew it is no longer

7 *It must be remembered that the non-rational has always been part and parcel of capital. Thrift (2008) mentions Keynes' infamous ‹animal spirits› - «contagious spirits like confidence, fear, ‹irrational› exuberance, bad faith, corruption (…) and the very stories we tell ourselves about our economic fortunes», as «powerful psychosocial forces», which, however, have been ignored albeit with a few exceptions (Keynes, Pigou, Mill, Bagehot).*

8 *Chapman (2009) addresses the issue of emotional durability as a possible, if yet untested, solution to the issues of in-build obsolescence and a Kleenex-culture of disposability. His argument of a lack of a specific language of emotional durability both in academic and industry circles echoes Massumi's point of a lack of a specific grammar for affect.*

9 *Manuel DeLanda (2002) makes explicit the connection between this notion of capacity and Gibson's notion of affordance, indicating a potential capacity of an object, different from intrinsic properties and actualized only in relation to specific context. For instance, a piece of ground whose capacity of affording support to walking creatures is not another intrinsic properties, rather one that emerges only in relation to the presence of said creature. Furthermore, affordances are exquisitely symmetrical insofar as they express both capacities of affecting and being affected.*

a founding entity, but what counts are ceaselessly coagulating and dissolving waves of affective states around which the negotiable fictions of the ‹I› gather and are verbalised. As the point of emergence, assemblage and coexistence of different levels,[10] affect is first and foremost immanence, that is, it is manifest in the material world. Therefore, it has to be experienced, and experimented upon. Deleuze remarks upon this point when he says: «No one knows ahead of time the affects one is capable of; it is a long affair of experimentation» (Deleuze 1988, 125).
This virtual, unactualized aspect of affect is significant insofar as it helps to clarify the distinction between emotion and affect. While affect is autonomous and openness to the possible, emotion is the most contracted expression of affective capture. Else said, affectivity is a force that possesses a material and energetic dimension (i.e. affects increase or decrease the power of the body, they enhance it or deplete it), it is a flow of intensity that mediates the relationship between the pre-individual and the individuated (Virno 2001, 78).[11]

I now turn to investigate the general framework provided by theories of post-fordism and late capitalism. Here, too, the prevalence of an affect-based register is found in the work of several theorists (Clough 2007, Hardt 1999, Illouz 2007, Lazzarato 2006, Massumi 2002, Stiegler 2010, Thrift 2006, 2008, Vrasti 2008).

Sociologist Eva Illouz's notion of ‹emotional capitalism› describes «a culture in which emotional and economic discourses and practises mutually shape each other, thus producing (…) a broad, sweeping movement in which affect is made an essential aspect of economic behaviour and in which emotional life – especially that of the middle classes – follows the logic of economic relations and exchange» (Illouz 2007, 5). For Illouz the process of managing and giving names to emotions (against their volatile nature) has engendered an ‹emotional ontology›, that is:

*The idea that emotions can be detached from the subject for control and clarification. Such emotional ontology has made intimate relationships commensurate, that is, susceptible to depersonalization, or likely to be emptied of their particularity and to be evaluated according to abstract criteria. This in turn suggests that relationships have been transformed into cognitive objects that can be compared with each other and are susceptible to cost-benefit analysis (Illouz 2007, 36).*

Terminally disjointed from the social, material, cultural and human context responsible for their emergence, emotions become quantifiable, countable, and discrete – objects that can be traded and exchanged.

10 *Although these levels may be described in terms of body and mind, depth and surface, action and reaction, they should not, however, be intended as binary oppositions, but as «resonating levels» (Massumi 2002, 33).*

11 *See Simondon (2001).*



## Capture, domestication and saturation of affect

Here it might be relevant to refer to philosopher Bernard Stiegler's work, which focuses on a critical analysis of mediatic capitalism as directly affecting the spiritual life of the individual, namely the life of the brain itself, via an affective saturation and destruction of attention, taken as particular instances of the destruction of libidinal energy. Stiegler (2008) defines ‹capture of attention› as a globalised phenomenon of «synchronised and hyper-realist collective hallucination» that produces a syndrome of cognitive and affective saturation.[12] This systematic capture of attention is one with cultural capitalism and is made possible by a plethora of psychotechnologies. What is interesting in Stiegler's perspective is not only that the framework is no longer a biopower controlling producers, but by a psychopower controlling consumers. Rather, it is the set of modalities through which this process takes place to be significant for our reflection on design. Among the psychotechnologies enlisted by cultural capitalism toward the creation of spaces of affective capture we find self-help literature and the advice industry (Illouz 2007), soft-power geopolitics, pharmaceutical industries and psychopharmaceuticals,[13] storytelling-based marketing, experience economy, preferences listing and, crucially, emotion-driven design.

As Nigel Thrift (2006) remarks in his lucid analysis on new forms of consumption: «For some time now, there have been attempts to extend the signature of the commodity, both by enlarging its footprint in time and by reinforcing its content, most especially by loading it with more affective features» (Thrift 2006, 286). Certainly commodities are being stretched, dilated, swelled. However, as I am trying to argue throughout, this process does not involve «loading commodities *with* affective features» as much as turning them into triggers *for* an increasingly unmitigated affective experience. This dilation of the experiential factor, or unlimited offer of pre-packaged intensities, must be read, however, as the ultimate dispositive of abolition of the experience *tout court* (Consigliere 2010).[14]

Among capitalistic modes of harnessing cognitive and non-cognitive (affective) competencies, Thrift (2006 and 2008) discusses sensory branding, *buy-ology* and neuromarketing techniques aiming at unlocking buyers' secret needs and desires by working either on measuring their brain activity and its correlation with the propensity to buy; or else, by implementing a socio-cultural re-engineering of consumers' mind involving the whole of their sensorial/affective realms.[15] We are now well beyond sensorial branding. We are

12 *On the relation between new economy and attention deficit see also Marazzi (2008).*

13 *On the triangulation among visual discourse of psychopharmaceuticals, design and the production of subjectivities see Marenko 2009.*

14 *Stefania Consigliere's essay draws from Isabelle Stengers and Philippe Pignarre (2005) La sorcellerie capitaliste. Pratiques de desenvoutement, Le Decouverte, Paris. For Stengers capitalism in itself is a system of sorcery, whose modes of capture (against which we have no protection) include, I argue, emotion-driven design.*

15 *With the term ‹neuromarketing› we intend a new field of research at the crossroad of psychology, science and marketing, which employs brain scanning techniques such as fMRI (functional Magnetic Resonance Imaging) that by detecting the amount of oxygenated blood in the brain can visualize areas as little as one millimetre where brain activity flares up. Neuromarketing is «only one small aspect of the larger neuroeconomy that includes the psychopharmaceutical industry, the neurological products themselves (…) the financial services, the marketing companies, the consumers and, lastly, its own financial index»*

now in the empire of *worlding*, i.e. the creation of meaningful worlds engendered by a strategic modulation of flows and waves of affects.

I argue that emotion-driven design should be located within this framework in order to understand its implications and the (ideological) rationale underpinning its endeavour. Emotion-driven design, like psychopharmaceuticals or neuromarketing, belongs to an ongoing restructuring of the relationship between subjectivities and capitalism, mediated by patterns of consumption, experience, lifestyles, moods, in short, by affect. Emotion- driven design has to do less with design and more with the social and cultural monitoring of affectivity. Emotion- driven design has to do, ultimately, with new, pervasive, strategies of biocontrol.
We must be careful, however, not to confuse social critique with paranoia.

*The target of control is not the production of subjects whose behaviours express internalized social norms; rather, control aims at never-ending modulation of moods, capacities, affects, and potentialities, assembled in genetic codes, identification numbers, ratings profiles, and preference listings, that is to say, in bodies of data and information (including the human body as information and data) (Clough 2007, 19).*

In his famous and prescient *Postscript on Control Societies* (1995) Deleuze wrote that control operates on, and equates with, modulation of moods, access codes, passwords.[16] The object of modulation is life and living being, and it is through the control of modulation that biopower is exercised. Philosopher Maurizio Lazzarato (2006) draws on Deleuze when he writes:

*The capture, control and regulation of the action at a distance of one mind on another takes place through the modulation of flows of desires and beliefs and through the forces (memory and attention) that makes these flows circulate in the cooperation between brains. In modulation, as a modality of the exercise of power, it is always a question of bodies, but now it is rather the incorporeal dimension of bodies which is at stake. The societies of control invest spiritual, rather than bodily, memory (contrary to the disciplinary societies) (Lazzarato 2006, 185).*

These dispositives of control and the new relations of power that operate by capturing memory and attention take the name of *noo-politics* (Stiegler 2008). «If disciplines moulded bodies by constituting habits mainly in bodily memory, the societies of control modulate brains and constitute habits mainly in spiritual memory» (Lazzarato 2006,186). In other words, we can say that affects, language, knowledge and life itself are taken as productive, engendered and exploited.

*(Abi-Rached 2008, 1160). See Senior, C. and Lee, N. (eds.) (2008) Journal of Consumer Behaviour. Special Issue: Neuromarketing, Volume 7 Issue 4-5, July - October.*

*16 Deleuze defines modulation as such: «controls are a modulation, like a self-transmuting molding, continually changing from one moment to the next, or like a sieve whose mesh varies from one point to another» (Deleuze 1995, 179). Tellingly, we encounter discussion about moods also in texts about branding of places and third places. See Klingmann 2007 where alongside performance, appeal and impression, differentiation and seduction are listed as the criteria that make up a strong personality in architecture.*



Focusing on how to define the singularity of relations of control, Lazzarato's analysis of the transition from disciplinary societies to societies of control invokes Gabriel Tarde to find an answer. Tarde, whose work is undergoing a slow but consistent rediscovery in the field of humanities and social sciences (see Deleuze and more recently Latour), was one of the most influential 19th century French sociologists. Fierce opponent of Emile Durkheim, Tarde refutes Durkheim's notion that society is always greater than the sum of its parts, an idea he considers a mystical abstraction. On the contrary, Tarde maintains that the whole is always *inferior* to the parts. Moreover, and essential for an understanding of the role of affects in late capitalism, Tarde had the radical intuition that economy as such rests on a core of beliefs and desires, what he calls ‹passionate interests›. Finally, his understanding of society as epidemiological, i.e. based on the idea that affects spread like epidemics, is of the utmost relevance to this paper.
However, my concern lies not much on the critique of postfordism outlined above, as on the extent to which we can use it to analyse our relationship with the designed object. To do this, let us examine the way affects spread, how they circulate among bodies and what traces they leave of their passage. And what affects *do*.

## On contagiontology

Again, it is to Tarde's micro-sociology of contagious repetition and imitation that we refer. He says:

*… it is nevertheless true that … belief and desire bear a unique character that is well adapted to distinguish them from simple sensation. This character consists in the fact that the contagion of mutual examples re-enforces beliefs and desires that are alike, among all those individuals who experience them at the same time … we no longer have epidemics of penitence … but we do have epidemics of luxury, of gambling, of stock-speculation, of gigantic railroad undertakings, as well as epidemics of Hegelianism, Darwinism, etc. (Tarde 1903 in Lazzarato 2006).*[17]

Thrift (2008) draws on Tarde to discuss the socio-biological nature of processes of contagion and imitation according to which affects circulate within an ecosystem. He argues for a biology-based account of economies and human societies, or at least one where biology and culture might be considered in equal measure. Perception, cognition and action are not separate realms. The world of experience has neurophysiological foundations. Experience (and even history itself) can be reframed as swashes of hormones «which constantly operate on what are remarkably plastic brain synapses through the medium of cultural amplifiers like caffeine, sentimental novels, pornographic works, and all manner of consumer goods» (Thrift 2008, 88).
If material culture is but an extension of human cognition (and not its reflection), this means that its evolution is actively shaping human intelligence. Take for instance the media, argues Thrift, and their increasing power in propa-

*17 The end of the 19th and the beginning of the 20th century witnessed a great interest in crowd behaviour and psychology: the idea of a group mind affecting (often irrationally) a crowd was taken for granted (e.g. Gustave Le Bon's notion of social contagion in The Crowd: A Study of the Popular Mind, 1896)*

gating psychosocial forces, such as identification of populations/audiences, data mining, new forms of demographics (everyday metrics like hits, social networking sites and so on). They are creating new sources of reflexivity where audiences' responses are interpreted as a combination of technology, imitation and the «swash and swirl of affect» (Thrift 2008, 84).

A different viewpoint is argued by the late Teresa Brennan (2004), whose theory of transmission of affects states «the opposite of the sociobiological claim that the biological *determines* the social. What is at stake is rather the means by which social interaction shapes biology» (Brennan 2004, 74). For Brennan, the circulation of affects alters anatomical makeup – an anti-neo-Darwinist idea if ever there was one. Not only is the transmission of affect socio-psychological in its origins, it is also responsible for bodily changes, as it modifies the biochemistry and neurology of the individual.
Brennan points out how «in a time when the popularity of genetic explanations for social behaviour is increasing, the transmission of affect is a conceptual oddity. If transmission takes place and has effects on behaviour, it is not genes that determine social life; it is the socially induced affect that changes our biology» (Brennan 2004, 1).[18] In other words, the transmission of affect is a process «social in origin but biological and physical in effect» (Brennan 2004, 3).
Thus, intensities spread by contagion: a viral infection that travels through assemblages, a series of psychogenic epidemics (e.g., chronic fatigue syndrome, attention deficit hyperactivity disorder, depression) that engulfs corporealities via images and mimesis, smells and auditory factors. It remains unclear, however how this process actually takes place. For Brennan, even the definition of psycho-epidemics does not tell us «how a social and psychological affect buries itself within or rests on the skin of an utterly corporeal body» (Brennan 2004, 3).

I wonder whether we could use these ideas on the transmission and dissemination of affect to suggest an epidemiological map of how the spreading of intensities is co-opted and monitored by a semio-chemio-neuro-affective capital and, more to the point, why should design pay attention. What Karl Palmas (2009) with fortunate expression calls ‹Tardian contagiontology› ought to be understood in the context of a daily life increasingly mined, monitored and recorded by psycho-technological devices. Our probable future is rendered, made visible and foreseen by new modes of surveillance (social monitoring, predictions of behaviours, mapping of patterns of consumption and so on). However, to define these apparata as surveillance is perhaps reductive. Rather, these technologies are forms of *entrainment* whereby one person's affects are linked to another by chemical, olfactory, rhythmic and hormonal means. Entrainment is the process by which «one person or group's nervous and hormonal system are brought into alignment with another's» (Brennan 2004, 9).[19] Hence, the creation of ad-hoc publics. Again, we find Tarde uncannily prescient on this regard.

*18 Brennan argues that this idea encounters resistance, as the individual is still assumed as being emotionally independent, affectively self-contained and owning his/her own emotions.*

*19 One instance is chemical entrainment which works mainly by smell – unconscious olfaction (i.e. pheromones, molecules that communicate chemical information concerning aggression or sex).*



## Publics

At the end of the 19th century, when the societies of control begin to elaborate techniques and dispositives, Tarde explains that the ‹social group of the future› is neither the crowd, the class, nor the population, but the ‹public› (or rather publics). By the public, Tarde understands the public of the media, the public of a newspaper: «The public is a dispersed crowd in which the influence of minds [esprits] on one another has become an action at a distance» (Tarde 1989:17 in Lazzarato 2006, 179).
If it is important to reflect on this notion of ‹publics› expressing the new subjectivities that characterize control societies as among the public, invention and innovation spread almost instantaneously «like the propagation of a wave in a perfectly elastic milieu» (Tarde 1989, 38), in a broader sense this has to do with the range of affective competencies increasingly demanded and mobilized by the semio-chemio-neuro-affective capital so to «ensure the *spontaneous* and *enthusiastic* participation of individuals» (Vrasti 2008). Thus, we can talk about a capillary micro-distribution of governance that affects intimate lives, desires, modes of conduct, social relations, lifestyles aspirations, feelings – in short, the spectrum of our affective sphere. The personal is governed. Affective literacy has become a prerequisite for an economically proficient participation in neoliberal economies. To use Thrift's eloquent expression: «affect brings together a mix of hormonal flux, body language, shared rhythms and other form of entrainment to produce an encounter between the body (understood in a broad sense) and the particular event» (Thrift 2008, 236).

In this sense, consumption itself is nothing but a «series of affective fields» (Thrift 2006, 286). Waves of affects surge and circulate where intuition and habits are distributed over small slices of time, presiding over the encounter with the commodity, clearly influencing consumption patterns by affectively binding consumers. To tap into this affective milieu the industry that investigates consumers' wants and needs is even more forcefully employing neuroaesthetics (the study of the neural basis of artistic creativity and experience) as well as neuromarketing. The aim is to produce a «rapid perceptual style which can move easily between interchangeable opportunities, thus adding to the sum total of intellect that can be drawn on» (Thrift 2006, 286). The point is to swiftly mobilize new structures of thought, to rewrite experiences as commodities, to immerse the relationship between consumer and object in the amniotic fluid of a market-driven emotional prosthetics.
One example of this is the active and vocal involvement of consumers via any user-generated social media platform, where the capture of enthusiasm is co-opted and deployed in what could be described as an ongoing beta test (for instance, Amazon preference listings). Another example is the continuous expansion of the resonance of commodities, whose stickiness stretches out through sensory design (smells, noise, aromas, texture) and through «extended architectures of onflow, designed as a process in order to capture process» (Thrift 2006, 295).

What is the connection between the types of social relations and subjectivities emerging from, and required by, this specific formation of capitalism and the realm of design? Can it be argued that (some of) these competencies are shaped

by, and surface from, the encounter with designed objects? How can our encounter with the commodity be reconfigured to account for such contagious affectivity? Finally, what are the emotional pressure points that trigger waves of affect to act like glue between consumer and object via consumption?

Many questions, with no claim to provide answers. Only some indications of where those answers might be found: for instance in the shifting boundaries between ‹prosumption› and ‹hacking›, where the encounter with the commodity is reconfigured not only by making consumption and production closer, but also by a power transfer into the competences and inventiveness of users.[20]

## Conclusion

This paper started with a twofold ambition. First, it aimed at engaging critically with the landscape mapped out in so much of the current design and emotion literature arguing instead for the necessity of an affective turn. Second, it attempted to do so by reframing the issue of emotion- driven design within the broader framework of late capitalism.

If it is true that design is always concerned with future behaviours, with inscribing into matter a realm of possibilities, with offering a potential map of the immediate future and its events, it will also be true that any theoretical resource that can capture, even partially, these realms, should be a welcome addition to the tool-box of the thinking designer, especially if it can offer ways to analyse, explain and predict patterns of consumption, and the swerves of affect emerging in the encounters with objects. Ideas concerning the formation of public and audiences, the rendering of future forms of interaction, and the way in which affects spread should certainly be of interest.

When we address not only the way human experience itself is being rewritten, but also what counts as experience; when we look at ways in which affectively controllable environments are engineered; when, finally, we understand the spreading of influence and affect via forms of mimetic desire, imitation, in short, via viral models of contagion, we have on our hands theoretical tools to map what, with fitting expressions, Thrift describes as the ‹geography of what happens› and ‹speculative topography›. Theory is nothing but a diagnostic tool, a way of asking questions – both a ‹quest and a questioning›, rather than a way of suggesting answers. And design, if we want, can be at the forefront of this process.

*20 See Alvin Toffler's influential 1980 book The Third Wave and Scott Burnham's well known pamphlet (2009).*



## References


Abi-Rached, JM (2008) The implications of the new brain sciences. EMBO reports, 9(12): 1158-1162

Ahmed, S. (2004) The Cultural Politics of Emotion Edinburgh, Edinburgh University Press

Blythe, M.A., Overbeeke, K., Monk, A.F., Wright, P.C. (2004) Funology: from Usability to Enjoyment. Dordrecht,Kluwer Academic Publishers

Brennan, T. (2004) The Transmission of Affect Cornell University Press

Burnham, S. (2009) Finding the truth in systems: in praise of design-hacking. RSA Design & Society

Chapman, J. (2009) Design for (emotional) durability. Design Issues, Vol 25, n. 4 pp. 29-35

Clough P. (2007) The Affective Turn. Theorizing the Social. Durham & London, Duke University Press

Consigliere, S. (2010) Piacere/dolore in VV.AA. Le Passioni della Crisi pp. 107-122 Roma, Manifestolibri

Damasio, A. (2003) Looking for Spinoza. Joy, Sorrw and the Feeling Brain. London, Heinemann

Davenport, T.H., Beck, J. C. (2001) The Attention Economy: Understanding the New Currency of Business. Harvard Business School Press.

DeLanda, M. (2002) Intensive Science and Virtual Philosophy. London & New York, Continuum

Deleuze, G. (1988) Spinoza: Practical Philosophy. San Francisco, City Lights Books

Deleuze, G. (1995) Negotiations. New York: Columbia University Press

Demir, E. (2008) The field of design and emotion: concepts, arguments, tools, and current issues. METU (Middle East Technical University), Journal of the Faculty of Architecture, vol. 25, no. 1, pp. 135-152

Desmet, P.M.A. (2004) Measuring emotions. Development and application of an instrument to measure emotional responses to products. In Funology: from Usability to Enjoyment. pp. 111-123

Desmet, P.M.A. and Hekkert, P. (2009) Special Issue Editorial: Design& Emotion. International Journal of Design, 3(2), 1-6

Desmet, P.M.A. and Hekkert, P. (2007). Framework of product experience. International Journal of Design, 1(1), 57-66.

Desmet, P., van Erp, J. and Karlsson M. eds (2008) Design & Emotion Moves Newcastle upon Tyne, Cambridge Scholars publishing

Jordan, P.W. (2000) Designing Pleasurable Products. An Introduction to the New Human Factors. London & New York, Taylor and Francis.

Hardt, M. (2007) «Foreword: what affects are good for», in Clough P. The Affective Turn. Theorizing the Social. Durham & London, Duke University Press, ix-xiii

Hardt, M (1999) Affective labor boundary 2 26: 2

Illouz, E. (2007) Cold Intimacies. The Making of Emotional Capitalism Cambridge: Polity Press

Klingmann, A. (2007) Brandscapes. Architecture in the Experience Economy. Cambridge, Massachusetts, London, MIT Press

Kurtgozu, A. (2003) From function to emotion: a critical essay on the history of design arguments. The Design Journal, vol. 6, pt. 2, pp. 49-59.

Lazzarato, M. (2006) «The concepts of life and the living in the societies of control» in Fuglsng M. and Sorensen B.M. (eds) Deleuze and the Social Edinburgh, Edinburgh University Press. p. 170-190

Latour, B. (2005) Reassembling the Social: An Introduction to Actor-Network-Theory. Oxford and New York, Oxford University Press

Latour, B. and Lepinay V.A. (2010) The Science of Passionate Interests: An Introduction to Gabriel Tarde's Economic Anthropology. Chicago, Chicago University Press

Lindstrom, M. (2008) Buy-ology. London and New York, Random House

*Marenko, B. (2009a) «Now I can feel myself!» The production of affects in the visual discourse of psychopharmaceuticals in Hackney, F., Glynne, J and Minton, V. (eds) Networks of Design. Proceedings of the 2008 Annual International Conference of the Design History Society, University College Falmouth.*

*Marenko, B. (2009b) Object-relics and their effects: for a neo-animist paradigm in Darras, B. and Belkhamsa, S. (eds.) MEI. Médiation et Information n.30-31 Objets & Communication. Pairs, Editions de l'Harmattan*

*Marazzi, C. (2008) Capital and Language. From the New Economy to the War Economy Los Angeles, Semiotext(e) MIT Press*

*Massumi, B. (1996) The autonomy of affect. in Patton, P. (ed.) Deleuze: a Critical Reader. pp. 217-239. Oxford, Blackwell*

*Massumi, B (2002) Parables for the Virtual. Movement, Affect, Sensation. Durham & London, Duke University Press*

*Matthews, B. (2010) Can we measure emotions for design? Paper presented at CEPHAD 2010 // The borderland between philosophy and design research // Copenhagen*

*McDonagh, D. et al. (2004) Design and Emotion. The experience of everyday things. London, New York, Taylor & Francis*

*Moisi, D. (2009) The Geopolitics of Emotion. How Cultures of Fear, Humiliation and Hope are Reshaping the World. London, The Bodley Head*

*Norman, D. (2004) Emotional Design. New York, Basic Books*

*Parisi, L and Goodman S. (2005) The affect of nanoterror, Culture Machine, Vol 6, special issue on Biopolitics.*

*Palmas, K. (2010) The defense minister's new philosophy, Eurozine, www.eurozine.com*

*Palmas, K. and Kullenberg, C. (2009) Contagiontology, Eurozine, www.eurozine.com*

*Palmas, K and von Busch, O. (2006) Design management: a reinterpretation. Lecture at Istambul Technical University. Accessed at: http://www.hgu.gu.se/Files/Handels_mainsite/projects/corpcitizenship/News/ITU_lectureMOP_final.pdf*

*Rose, N. (2006) The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century. Princeton University Press*

*Savas, O. (2008) Emotions for the necessary. METU (Middle East Technical University), Journal of the Faculty of Architecture, vol. 25, no. 1, pp. 163-175 accessed jfa.arch.metu.edu.tr/archive/0258-5316/2008/cilt25/…/163-175.pdf -*

*Simondon, G. (2001 [1989]) L'Individuazione Psichica e Collettiva Roma, DeriveApprodi*

*Spinoza, B. (1993) Ethics. London, Everyman*

*Stiegler, B. (2008) Biopower, psychopower and the logic of the scapegoat Paper presented at the Philosophy of Technology workshop, Manchester Metropolitan University, available at: http://www.arsindustrialis.org/?q=node/2924.*

*Stiegler, B. (2010) For a New Critique of Political Economy. London, Polity Press*

*Taussig, M. (1992) The Nervous System. London and New York, Routledge*

*Thrift, N. (2008) Pass it on: towards a political economy of propensity. Emotion, Space and Society, Vol.1 (No.2). pp. 83-96*

*Thrift, N. (2008) Non-Representational Theory. Space, Politics, Affect. London, and New York, Routledge*

*Thrift, N. (2006) Re-inventing invention: new tendencies in capitalist commodification Economy and Society, Vol 35, Issue 2, pp. 279 - 306*

*Virno, P. (2001) Grammatica della Moltitudine. Per un'Analisi delle Forme di Vita Contemporanea. Roma, Rubettino*

*Vrasti, W. (2008) How to use affective competencies in late capitalism. Available at http://tiny.cc/d344s*

*Wiles, W. (2010) Design hacking - quiet revolution or noisy hobby? Icon, 082, April, pp. 42-44*

*Wright, P. et al. (2004) Making sense of experience in Funology. pp. 43-53*

*Yagou, A. (2006) Critical reflections on design and emotion, Proceedings of the Design Research Society International Conference: WonderGround-2006, 1-4 November 2006, IADE, Lisbon, Portugal. Available from: http://www.iade.pt/drs2006/wonderground/proceedings/fullpapers/DRS2006_0250.pdf/*

Jan Eckert IUAV University of Venice, janeckert@web.de
Marco Mason IUAV University of Venice, mason@iuav.it

# From Social Relevances to Design Issues

Keywords: Social Relevance, Transdisciplinarity, Information-design, Geo-Information-Systems, co-creative

Usually design projects are born in the situation a person, company or institution is asking a designer to provide a service in order to improve technical, aesthetical or functional aspects of his product or service. In some way this ‹way of doing it› has put designers in a rather passive role, a fact which stands in contradiction to the way most designers see themselves.
We'd like to present two case studies where identifying a social relevance became the starting point for a design research before it actually became a project.

One is located in the bay of Venice, the other one in the swiss alps. Preliminary researches were focusing new dynamics emerging from Web-Geo-Information-Systems (WebGis) and Telematics and consequently both projects deal with peoples needs related to their location they live, work or spend their leisure time in. In one cases the decision was taken to invest time in an observation of a specific social issue in order to identify problems which could be dealt by designing a WebGis. The other case is based on a strong co-productive approach since it meets the needs of Venice's citizens. Important is that both GIS-applications don't only deal with the graphic treatment of data but are based on an information architecture developed together with and for the people who are using it.

Many discussions have been held about how to approach design research should begin or what it should concentrate on. Some approaches were developing methods to treat design itself as an object of research, others have been rather based on the practical nature of design processes. In the recent past also a remarkable step towards Inter- and Transdisciplinarity has been undertaken. But one thing which in our eyes has not been talked about enough is a proactive role of the design researcher himself.
Like in the world of design practice in the ‹research world› as well we are used to be confronted with problems or research proposals which means that in most cases we are not the person who identifies the problem but are asked by other people to solve them. Often the answer to this rather passive role is a set of participatory methods directed by the designer himself in order to focus the user - but doesn't it seem somehow like a compensation of what should have been done before – actively talk and work with people to identify new design problematics?

## ‹D› like Detect

The recent move towards Transdisciplinarity and the exploration of other research fields shows that designers are about to redefine their personal role in the scenery of design research. A search has begun for «(...) the phenomena of the world we are interested in observing and understanding» (Findeli et al., 2008). First steps to change the designers role from ‹problem-solvers› towards ‹problem-identifiers› (Frascara, 2002).
In many cases we might not know yet about the relevance of design for other fields or problems. So it is up to us to detect and identify these problems and make them become issues which can be dealt by design research. Something which is emphasized by Jorge Frascara in his dialogue with Dietmar Winkler on design research: «If designers want to be socially relevant, we must become active agents in the identification of problems, because clients only see a need for design when that need has become obvious» (Frascara, Winkler, 2010)
In the both of the following cases a preliminary research on Geo Information Systems and Telematics has been made. But there wasn't yet defined a specific field where the research might be applied. In Consequence the following step was to observe different fields in order to detect socially relevant problems which might trigger a starting point for a design research project.

## A Proactive user and new social issues in the ‹Network Society›

Several influential people have stated in the last decade how Information Communication Technology would affect the participation of people in fields like governance, environment, security, and so on. The philosopher Michael Castells talked about the ‹network society› and how a new technological context affect spatial and social transformations of cities and regions, which means also our everyday context especially in terms of social needs: for example a citizen's active participation in the city government or the prevention of people from environmental risks (Castells, 2009). Only twelve years ago Al Gore foresaw a ‹Digital Earth› as a model of representation of the planet (Al Gore, 1998). While five years ago Kofi Annan at the ‹World Summit on the Information Society› saw a cornerstone in the Internet connection to all the world's cities in the development of digital democracy. These claims, even if in a very general way, anticipated the importance and role of ICT, which get more and more established for development, transformation and affecting many practices of cities and regions life in contemporary society.
In our researches we have paid specifically attention to the telematic application of geographic information systems (GIS), something which has opened further and important possibilities to participate actively in sharing and conveying information which concerns social problems (e.g. e-government).
In fact during the last few years, the telematic scenery has changed considerably. The most evident aspect of this change is the passage from the hierarchical structure of the Web 1.0 – which follows communicative models assimilable to the broadcasting in which the producers provide the contents to a wide public – to the Web 2.0 in which the communicative methods become modular, distributed, created and arranged by a multitude of users. These transformations influence inevitably GIS applications as well. Information in combination with digital maps is more accessible than ever thinking of people's mobile devices and their possibility to access and contribute digital content at nearly any place.
With the webGIS (2.0) happen both a technological change and an evolution of the forms of social interaction, which is becoming more and more dynamic and participatory. Thanks to this communication mean people become very involved in getting, sharing, and creating information.
From a designers point of view the realistic representation of the territory inside of an interactive and multimedial web environment enables the configuration of new typologies of interfaces through which users may convey information. This means that in this specific case design has to pay even more attention to the users and accommodate their proactive role with adapted information structures and interfaces.
The complexity due to the interplay of several dimensions such as a technological, a social, cultural and personal, requires to ground such projects on methods that have to involve a better understatement of the people using such services and a transdisciplinary approach.



## Two Case Studies

### PatOnLine for the City of Venice

In the first case the Venice City Council decided to develop a WebGIS application which will offer citizens the possibility to give their own observations about new Urban City Plan. Thanks to this web-platform citizens of Venice can submit observations about the Plan and share opinions in a new and more dynamic way that provide easy accessibility to city government polices.

### *E-government meets Social Relevances*

Some while ago the city of Venice has introduced its concept of the ‹digital citizen› which consists in a new dynamic form of e-governance by which Venice citizens are becoming more and more involved, thanks the adoption of ICT services, in the city management policies.
First these services were only accessible at the citizens-office in Venice. But in reality this kind of bureaucracy procedure often requires a lot of time and ends up often quite complex. In consequence a number of s ocially relevant services have been brought on the web by creating Web GIS applications (e.g IRIS, ARGOS, Figure 1) in order to cover the most important functions and means in the Venice communication policy. PatOnLine will represent one future piece of this broad system of communication, which wants to satisfy Venice's citizens needs.
Working on the new Land Development Plan there was identified the urgency to work much closer with the citizens together in order to accommodate their needs. Simple facts like turning a quiet zone into a building zone might have big effects on social life in these areas and it is absolutely relevant to know the citizens opinion on such changes.
The challenge was to find an effective way to create a close collaboration with the citizens in order to allow them to bring forward their own remarks about the right zones and building areas of a Venice's new Land Development Plan.

*Figure 1*→**XI**
*WebGIS applications at disposal of Venice's citizens*



### *Identifying design issues*

In the described context a series of questions rose which could trigger possible starting points for a design research or project.
Some of these questions made were: Is it possible to create an internet tool to give citizens a quite easy way to express they own opinions about new Urban Plan? And which kind of tool would be the most accessible one?
The proper answer was to use a mean that embody both the possibility to represent territory and the telematic access to the citizen in an active way. For these main reasons web GIS seemed the best solution. The combination of a map-application and user generated content resulted in new opportunities of sharing and accessing information between citizens and the authorities.
The aim of this future WebGIS is to offer consulting, management and signalization of the observations citizens or technicians have on the new plan. The application is located on Venice's web-platform together, as mentioned before, with other already existing services.
Citizens will be able to mark their observations right on the map and all in-

formation will be organized and managed by the WebGIS platform based on Web 2.0 technologies.

*Finding the right methodology*

Jesse James Garrett (Garret 2003) wrote «web design is more than just creating clean code and sharp graphics. A site that really works fulfills your strategic objectives while meeting the needs of your users. Even the best content and the most sophisticated technology won't help you balance those goals without a cohesive, consistent user experience to support it.»
First of all it is really important to identify who is our user and, above all, their profiles in order to design web GIS that can offer citizens accessibility in term of text languages, information architecture and interaction.
After having understood the user needs and the context requirements the next step is the arrangement of information and the interaction among them. It is crucial the way information is gathered, organised and presented in order to make it understandable and convey meaning. We pursued an effective information architecture that enables the citizens to navigate logically through an information space and offers them an intuitive access to contents. This is only possible because the content structure is based on a bottom-up approach which takes into great consideration the survey of user needs in order to keep in great consideration the social purpose.
Each of these design steps are merged into Information Design (Jacobson, 2000) which should define the arrangement of navigational items allowing the users to visualise the contents. Information Design focuses more narrowly on the information itself: information content design, page design, web site design, illustration design, typography decisions, and so forth. It should be the presentation of information in a way that facilitates understanding. It means detailed design of information that has to be provided to a particular audience to meet specific objectives – this is also in collusion with Italian accessibility laws for web interfaces. Finally the visual interface – which citizens will see online – is essentially the result of this design process.

The com-presence of severals figures in the creation of this webGIS system, who have taken part in different aspects of the projects, has requested a big design effort to correlate distinct professions.The result was a transdisciplinary and co-productive process to meet a socially relevant issue by designing the WebGIS platform called PatOnLine.

## Snowsense a Planning Tool for Backcountry Skiers and Mountain Guides

In the second case design meets both people who go to the mountains to have fun while skiing off-piste and people who actually work in the same area as mountain guides or rescuers.

*Detecting a relevance*

Every year in the swiss Alps around 30 persons die due to avalanche accidents and more than 3500 Helicopter flights are executed all year around to rescue people who get lost or injured in the mountainous areas. Besides the human damage there are huge costs being caused by these accidents. Only the Helicopter flights (‹in and out›, without treating, and loss caused by inability to work etc.) cause around 12 000 000 Swiss Francs each year. Money which could be much better spent into prevention or education of the people working or spending their leisure time in the mountains. (numbers are taken from the reports of the Swiss Air Rescue Companies: Rega, Air Zermatt and Air Glaciers, 2009)
In the Swiss context the Alps and all correlated activities represent a central cultural and economic good; problems around mountain life are highly perceived and have an immediate effect on social life as well.

*Identifying the real problem*

From a methodological point of view the starting point for the research was a series of interviews with mountain guides, mountaineers, rescuers, insurance companies or snow- and avalanche-experts to better understand where the real problem and cause for the high number of accidents may be.
These Interviews have shown that on the one hand the rescue seems to be perfectly organized and also most professionals who are working in the field have access to all important information whereas many of the ‹usual› backcountry-skiers could be much better prepared before they actually leave to the hibernal mountains.
This lack of knowledge and experience plays a crucial role in the decision making process during a ski trip off the pistes. The Psychologist Jan Mersch and the ski instructor Wolfgang Behr describe the decision making process as an interplay between rules, intuition, knowledge and the capacity to take a mental distance to the actual action or situation. While an experienced mountain guide is able to decide using his experience, knowledge and mature intuition, an intermediate or beginner bases his decisions much more on rules. (Mersch, Behr, 2009)

*Identifying a design question*

The next question made was: Is there any possibility to substitute the lack of experience of a beginning backcountry skier in order to give him a substantial base for the decision making process in the field? One answer can be found looking at researches made about decision making. Gary Klein writes about «expert's experiences which grow out of the ability to run mental simulations» further he says «constructing a mental simulation involves forming an action sequence in which one state of affairs in transformed into another» (Klein, 1999) Now is there any way to top up ones experience by mentally simulate a ski trip? And in fact planning a trip on a map before executing it, is a such a sort of simulation and gives people already most of the information, they will need to make decisions in the field.
As mentioned before Geo Information Systems and the spread of telematic systems has remarkably increased peoples interaction with georeffered information and the territory itself. Designing a specific map application for the planning of a ski trip might give skiers the opportunity to simulate their trip before executing it. As well they could interact and generate additional content which might be accessible on this map and useful for other people.
To tackle the technical part of the problem a final step has been done before setting up the design project. An analysis of the existing infrastructures and information channels in the swiss alps has shown that 1) even in mountainous areas there exists a very dense mobile network 2) there is also a wide spread network of sensors analyzing snow and weather conditions 3) there is a lot of

professionals in the field 4) there are many other skiers in the field.
Putting all this together it seemed quite evident that the realization of a new map-application was possible and connecting all these people and data-sources could offer much more possibilities to access the right information at the right place and time creating even more useful information by giving people the possibility to generate content themselves.

### *Setting up the project*

The WSL Institute for Snow and Avalanche Research SLF in Davos has already developed an IPhone-application which provides weather, snow and avalanche information and tool called the ‹Danger analyzer›. Together the decision was taken to invest in a research project in order to design a new WebGIS-application which offers a number of map-based functions which are focusing the planning of a trip. To complete the process of planning and executing also a mobile counterpart will be developed in order to accompany the decision making process in the field.
At home people will be able to draw their tour on a map, define a timetable, spot difficult passages, check the hill slope, altitude and exposition as well as include snow and weather prevision into their planning. The mobile application will enable them to acceed their saved trip and current data from measurements stations providing useful information for the decision making process in the field.
Another main feature of this mobile application will be the possibility to actively participate at the data interchange by sending feedback on the actual conditions from the field. This way new content becomes generated and shared with other users. A function which will might be very interesting for the professionals working in the field since before many of the information coming in from mountain guides or local observers has only been reported after their return back home, a time gap which in some cases might become critical when talking about avalanche risk.
Designwise the challenge is to create both a functional and inspiring application which also stimulates skiers to use it. Something which only can be achieved in a co-creative context working together with people who really will use the product after its development as well as understand people who actually refuse to use such programs or mobile devices. One fact which creates a truly co-creative and -productive context is that each single person in the project team (designers, programmers, avalanche experts, …) is a backcountry skier himself.

### *Actual State of the project*

By the mid of July a large number of meetings and workshops as well as days in the field have produced first prototypes of both the WebGis and the mobile application. Before many decisions about the structure and information architecture have been taken together with the programmers and skiers. Starting with paper models based on Post its and following up with first drafts of the database structure and ideas about the interface. Methods and steps we all might know from design practice put in a strong co-creative context.
The next step in winter 2010/11 will be the introduction of the prototypes to a group of selected future users. These people will use Snowsense for the first time in order to improve its usability and functionality. The aim is to present a final version of Snowsense and Snowsense Mobile in march 2011 during a backcountry skiing event in the swiss alps.

## Conclusion

Both projects PatOnLine and Snowsense grew from a common preliminary interest and research in the latest developments in WebGis and Telematics. Both though address totally different groups of people who in future will use the outcome of these projects.
By tracing back the starting point of these two research projects we wanted to demonstrate how a transdisciplinary approach and the researchers pro-active search for socially relevant cases might generate outcomes which become relevant in very different social contexts.
In our eyes the step towards Transdisciplinarity which was taken in the past few years should be completed with a designers attitude to detect and identify relevant themes and problems in various fields in order to turn design research into a domain which more and more becomes useful for other disciplines as well.

## References


Al Gore (1998) The Digital Earth: Understanding our planet in the 21st Century, Speach given at the California Science Center, Los Angeles, California

Castells, M. (2009), The Rise of the Network Society. The Information Age: Economy, Society and Culture, Malden: Blackwell

Frascara, J. (2006), Designing effective communications: creating contexts for clarity and meaning, Allworth, New York

Frascara, J. (2002), Design and the Social Sciences: Making Connections, Taylor & Francis, London - New York

Garrett, J. J. (2003). The elements of user experience: user-centered design for the web, AIGA, Indiana

Jacobson, R. (2000). Information Design, The MIT Press, Cambridge (Mass.)

Gary Klein, (1998), Sources of power, The MIT Press, Massachusetts

Wundt, W. (1905). Fundamentals of psychology (7th ed.). Liepzig: Engelman.

Wurman, R. S. (2001). Information Anxiety 2, Que, Indianapolis

Annina Schneller Bern University of the Arts,
annina.schneller@hkb.bfh.ch

# The Visual Rhetoric of Public Transport Information Design

Keywords:
information design, practice-based design research, visual rhetoric, design rhetoric, design rules, designeffects, public transport

According to a common view, advertisements and other products of commercial graphics aim to attract the attention and emotions of consumers, whereas information design is supposed to be understating, objective or neutral, aiming at the ideal of pure information. The Bern University of the Arts research project Visual Rhetoric 2: Rules and Scope in Public Transport Information Design, funded by DORE Swiss National Science Foundation, rejects this view. Even a simple piece of travel information such as a timetable is designed with an intention of producing effects and involves a decision on design rhetorical means (font, colour, placement etc.) that shape the information. The present paper promotes a rhetorical approach toward public transport information design (and design in general) and provides a glimpse of the themes of the mentioned research project.



According to a common view, advertisements and other products of commercial graphics powerfully aim to attract the attention and emotions of consumers, whereas information design is supposed to be understating, objective or neutral, aiming at the ideal of pure information. The Bern University of the Arts research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design*, funded by DORE Swiss National Science Foundation, rejects this view. Even simple pieces of travel information such as timetables or signposts on a railway platform seem to be designed with an intention of producing certain effects in the designed medium, such as legibility, perspicuity or simplicity, or effects in the viewer, such as comprehension or orientation. Even merely informing someone by means of a signpost or timetable involves a decision on design rhetorical means, since every choice of font, colour, placement or proportion will shape, change and interpret the information and influence its appearance.
This paper promotes a rhetorical approach toward public transport information design (and design in general) and gives a glimpse of the research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design*. As the project is still at an early stage, the first part of my paper provides a general overview of the project: research questions and objectives, project phases, methods, theoretical background and context. The second part focuses on some of the first results of the project, and the third part points to a number of difficulties encountered in doing practice-based research.

## 1. The Project

### Research Question and Objective

The research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design* aims to explore the specific low-level modes of visual rhetoric effective in public transport information design: what are the rhetorical means, modes and goals operative in information design? To leave behind the commonly presupposed rhetorical zero point could mean, for example, to focus on the rhetorical dimensions of *logos-ethos-pathos*. While in the common view information design is said to work mainly in rational or functional ways (*logos*), the possible effects of a piece of information design on a value-related level (*ethos*), such as gaining someone's trust or procuring an impression of security, are largely ignored, even more so its possible effects on emotions (*pathos*) like joy, comfort or attraction. Can or should a signpost delight its beholder, and can such an effect perhaps even enhance its comprehensibility? Or would it rather distract the viewer?

### Project Steps and Methods

The research project is practice-based and has a duration of 20 months. It relies on a triangulation of several methods and proceeds as follows:

— Project step 1: By means of an extended textual and visual rhetorical analysis of public transport information design and style manuals, along with guided interviews with experts on public transport (PT), the typical as well as the unusual effects of information design are gathered and explored.
— Project step 2: The hypotheses resulting from this analysis will be used for a theory-guided development of a series of travel information design variants

with distinct intended effects. Subsequently, the predicted effects of the design variants will be empirically tested in a mainly qualitative test arrangement carried out by the Usability Lab at HdM Stuttgart. A redesign of the variants according to the feedback of the tests will follow.
— Project step 3: The method and results of the tests as well as the feasibility of the most promising design variants will be evaluated by public transport (PT) and information design (ID) experts.
— Project step 4: Finally, the main findings will be recapitulated and contextualised. The theoretical output will include publications in scientific journals, presentations at design conferences and a style/rule manual for designers in public transport information design. A possible practical outcome will be the development of new information design solutions for our cooperation partner SBB (Swiss Federal Railways).

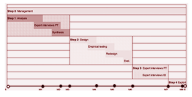


*Figure 1* →**XII**
*Project steps of the research project Visual Rhetoric 2: Rules and Scope in Public Transport Information Design. Project step 1, marked in green, will be presented in detail in section 2 of this paper.*

## Project Team

The project team is interdisciplinary. In addition to the core team of four people (including one employee of the project research partner SBB), it comprises five members of the ‹Communication Design› research area at Bern University of the Arts in consulting roles:

— Arne Scheuermann, project responsible (Dr. phil., head of research area ‹Communication Design›);
— Annina Schneller, project leader, core team (M.A. in philosophy);
— Simon Küffer, creative research assistant, core team (B.A. in visual communication);
— Hélène Jordi-Marguet, creative research assistant, core team (B.A. in visual communication);
— Beat Hürzeler, research partner (SBB), core team (M.A. in geography);
— Harald Klingemann, senior researcher (Dr. Dr. h.c. in sociology);
— Christian Jaquet, senior researcher (Dr. rer. pol.);
— Reinhard Wendler, research assistant (Dr. in art history);
— Lukas Zimmer, creative research assistant (B.A. in visual communication).

## Theoretical Background

Since the 1960s, there have been several attempts to extend rhetoric – as a traditionally mainly verbal art and theory – to the visual field (cf. Joost/Scheuermann 2008; Schneller 2010). These initiatives can be subsumed under the label of ‹visual rhetoric› (or ‹design rhetoric› for a broader approach that does not exclude impacts on a haptic or auditory level). The visual media and products typically treated by the relevant authors are posters, advertisements (e.g. Ehses 1986, Bonsiepe 1965; 1996) or industrial design products (e.g. Buchanan 1985). All these objects of study either contain a strongly persuasive or ‹selling› intention or are based on a pictorial message or visual figure. In short: Looking at such visual examples, the analogy with rhetoric, understood as the art of persuasion, effective communication, or of deviation (in the case of rhetorical figures) suggests itself. But what can be said about visual media such as railway timetables from a visual rhetorical perspective? Does a timetable try to persuade someone? Does it sell anything? Is there a hidden visual metaphor or any other visual figure or message to be analysed? No, a timetable just seems to be there, leaving the initiative to people who want to know about their train departure. No selling point, no emotions. Not even a picture – just numbers and places neatly listed in columns. One is tempted to say: mere information. The idea of pure information seems to be particularly fitting for products of information design: What you see on this poster is the data, nothing more.
The idea of maximal objectivity in design can be traced back to the functionalism of the 19th century that was characterised by an avoidance of ornament and subjectivity and by strictly sticking to the ‹form follows function› rule. Reinterpreted in the 20th century by the Bauhaus, the design of the ‹good form› and the hfg Ulm, the ideal of objectivity reached all fields of design from architecture to graphic design – and has almost naturally fitted the still rather young field of information design (cf. Stocker/Weber 2008). While information design in its early stages was largely synonymous with the design of digital data, it is nowadays defined by an informational intention and the aim of reaching efficient and effective communication (Horn 2000). The tasks of information design today reach far beyond interface design into social, scientific, technical, educational or political communication, and concern design areas such as wayfinding design, knowledge visualisation or corporate design (cf. Stocker/Weber 2008). Information design is also defined as analyzing or structuring data, as reducing complexity, aiming at orientation and understanding or as user-oriented and problem-solving (ibid.). Although such characterisations allow for an active role of the designer in the communication process and imply an orientation towards certain ideals, such as order or understanding, they nevertheless adhere to a view of information or data simply being *displayed* to the user – bringing to mind once again the idea of pure information. Even critical texts that warn against a naïve belief in data visualisations and show examples of visually manipulated information (e.g. Tufte 2006) still maintain the possibility of objective visualisation, provided the designer observes her professional ethics.
As may have transpired already, the project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design* tries to expose the idea of pure information as a myth, since every attempt to convey information necessarily uses a specific form. If not to say ‹form is information›, it seems reasonable to hold that «only through form can we grasp and display information». But every form shapes its content and has an impact on the effects of the information conveyed. Therefore, the very act of informing is deeply rhetorical.
There are, however, only few texts in visual rhetoric that grant or even force the rhetorical role of a piece of information design. Some authors speak of the impossibility of pure information or rhetoric-free communication in general and support the idea that design is more than just decoration or superficial styling without any impact on semantics (e.g. Ehses 1986, Bonsiepe 1965; 1996, Joost 2006). Charles Kostelnick (2004), writing about the ostensibly purely informative statistical atlases of the US, points out that designing information in order to make it easier for readers to understand and memorise what they see is by no means a neutral or objective, but rather a rhetorical process. According to Kostelnick, the presentation of the simplest informati-

on can have an effect of calling attention, persuading or forming the beliefs of the reader. There is one groundbreaking text in visual rhetoric that goes even deeper into explaining the rhetorical impacts of information design: «The Rhetoric of Neutrality» by Robin Kinross (1985). Kinross demonstrates that even the most objective and neutral looking visual product, the timetable, is in fact deeply rhetoric. At least three main theses of our research project can be traced back to Kinross' text:

— There is no neutral or pure information, since organising and articulating the information and giving it a visual presence *is* using rhetorical means. The fact that timetables are redesigned shows that the information is designed with a very specific goal. Therefore, the border between persuasive and informative design cannot be established clearly.

— Rhetorical effects go beyond the use of pictures and visual rhetorical figures; there is an important level of influence in the use (and underlying design decisions) of type, colour, placement and other formal means.

— Behind every design decision, there is a historically developed design tradition with its particular rules – rules every successful designer has to consider; therefore, even the idea of what neutral or informative design is supposed to look like is itself subject to historical and cultural vacillations and zeitgeist.

Taking seriously the idea that designing information is an inherently rhetorical process means to explore not just the *logos*, the merely functional or objective features of information design, but also to ask about the effects operative on the levels of *ethos* (e.g. trust, reliability) and *pathos* (e.g. well-being, *joy of use*; cf. Burmester/Hassenzahl/Koller 2002).

### Context and Scope

The research project is based on the results of the preliminary DORE Swiss National Science Foundation project *Visual Rhetoric in Commercial Graphics* (cf. Schneller 2009 for a short résumé), so it can draw on prior knowledge of rhetorical design rules in order to analyse and contextualise the forms of rhetoric effective in public transport information design. Together with the project partner SBB, it aims at evaluating and developing new visual concepts and implementations.

To give an idea of the most important results from the preliminary project being used and developed by the current project, I will briefly introduce the list of rhetorical design rules and the visual map of rhetorical effects in different fields of design that came out of the earlier study:

### Design rules

The project refers to a list of design rules. These rules connect the 24 most common effects attained by products of commercial graphics with the creative means by which these effects are produced. On the list figure effects like appearing serious, elegant, light, cute or horrific. The fundamental creative means on the list involve typography, materials, technique, form, colour and proportions. To take elegance as an example, the list includes the following means used by designers to create an elegant effect: capitals, gloss effects, black colour, symmetry.

The list of design rules is taken by the project as a starting point in two ways: As a basis for arguing that at least some of the effects mentioned in the list are probably also aimed at by information designers, so that information design would be effect-oriented in a similar way, i.e. function in rhetorical ways. Second, the list allows to explore which of the effects central to commercial graphics will prove only marginal for information design, and why this difference occurs. In turn, the new project will look for further effects crucial to information design that do not figure on the list – and ask why they are missing there.

### Visual rhetoric in different fields of design

The second tool taken from the preliminary project on visual rhetoric is a survey map of visual rhetoric in different design domains. The map is suggestive of the omnipresence of rhetorical effects on users or viewers (such as surprise, amusement, orientation, irritation) in different design domains such as industrial design, architecture, fashion, handicraft etc.

As the intention to take influence on observers in diverse ways is present in so many design fields, it becomes natural to look for rhetorical effects in the supposedly effect-free field of information design. The map can give hints as to possible effects: do they also occur in information design? In turn, the study of the visual effects of information design can possibly complete the map with aspects of influence specific to information design.

For detailed discussion of the project issues and results, cf. the publications of the research project team *Visual Rhetoric in commercial Graphics* (Jaquet 2008a; 2008b, Joost/Scheuermann 2008; Scheuermann 2008a; 2008b, Schneller 2009; 2010). A detailed publication of the list of design rules and the survey map is in preparation.

What is the use and area of influence of the follow-up research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design*? The exploration of low-level rhetorical effects is of interest for the theory of visual rhetoric, and more generally design rhetoric, as it is hoped to fundamentally widen the scope of the field and shed light on formerly unknown visual/design rhetorical aspects. It should also have interesting implications for the study of information design, where the myth of pure information is still prevailing and where emotional and value-related intentions or effects have been widely neglected. Moreover, the theoretical findings, together with the practical know-how gained in the course of the project, will be of use for the project partner SBB in redeveloping both their style guides and their travel information design.

## 2. First Results

After presenting the key parameters of the research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design*, I will now give an overview of the detailed methods, decisions and results of the first project step, the rhetorical design analysis. To make a virtue out of necessity – as the project and its findings are still work in progress – I hope to suggest to researchers who are preparing or are already engaged in a project some concrete ways of working with textual and visual material, to shed some light on how decisions can be taken and how a project develops. Instead of presenting the results in their final version, I will depict them at their different stages of elaboration, which involve notes, scribbles, cancelled parts and post-its. I especially hope to give an idea of how visual/design rhetorical concepts and tools can be used as a heuristic for visual analysis and development.

## Analysis of Design Manuals

To look at design from a visual rhetorical perspective means to ask, among other things, about the *effects* of visual communication – in our case of information design. The project therefore started with an analysis of effects of public transport information design. In order to learn about the effects *demonstrably* intended in public transport information design, we first analysed a vast set of style and design manuals, CI rules, customer surveys etc. of the SBB and other public transport companies. The mostly textual material was scanned with two questions in mind:

— Does the material describe a goal, an ideal or an effect that products of information design (or communication design in general) should have (e.g. recognisability)?

— Does the material mention the means or rules needed to attain the intended effect (e.g. «always use the same colour for the same function in order to attain recognisability»)?

The effects described in these manuals were listed, grouped into classes (similar effects were taken together), ordered relatively to their importance and frequency and finally assigned to the dimensions of *logos* (L), *ethos* (E) and *pathos* (P) (does the effect occur on a rational / functional level, does it carry a value or act on the emotions of the viewer?).



| | | |
|---|---|---|
| recognisability | • use corporate colours & logo<br>• same colour for same function<br>• same placement and sequence for same information | L |
| conciseness | • limitation of stylistic devices (colours, fonts, sizes)<br>• icon instead of text<br>• reduction to most important information<br>• location of information at points of decision (crossways, entrances/exits)<br>• no advertising close to important information | L |
| Security | • provide clear view (e.g. via survey maps)<br>• always inform in the same way<br>• use low radiant light (for good recognition of persons) | E<br>P |
| Comfort | • use warm light and colours<br>• avoid light reflections<br>• use visually and haptically convenient materials | P |

*Table 1*→**XII**
*Selection of intended effects and corresponding creative means figuring in public transport design manuals*

One key finding of the rhetorical analysis was that the most frequently mentioned effects are largely logos-based and seem to be a kind of superordinate effects, such as orienting people or being comprehensible. For these superordinate effects it proves difficult to find a specific means or rule by which they can be fully and reliably attained. As for the value-oriented effects, they are not too frequently mentioned, but still can be found in an interesting variety, whereas emotional effects are rarely mentioned in relation with information design but are very common in related areas such as corporate design.



*Figure 2*→**XII**
*Rating of intended goals according to the analysis of public transport design rule manuals: ‹core› – ‹important› – ‹less important (or maybe underestimated)›. Colours mark the rhetorical dimensions logos (yellow), ethos (green) and pathos (red).*



*Figure 3*→**XII**
*Revised and shortened version of the rating (similar concepts were merged). Instead of distinguishing between core and important goals, the idea came up to talk of ‹superordinate› versus ‹subordinate› intended effects.*

Another interesting outcome was the idea to order the effects intended by information design along a scale, together with effects that it wants to avoid but that are semantically related (e.g. invisible – reserved – visible – eye-catching – obtrusive etc). This scalar ordering in turn led to the idea to arrange the effects on a kind of ‹speedometer scale›, showing the intended effects in dark green, the effects that are unconventional (but might perhaps be interesting to be explored further) in bright green, and counterproductive effects in red. Such



scales could be of use either in the analysis or rating of existing design objects (cf. figure 4) or in determining the desired effects of a planned artefact.

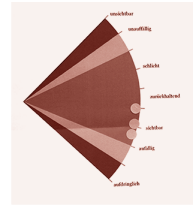


*Figure 4*→**XII**
*Example of a first attempt of arranging effect grades on a ‹speedometer scale›: ‹Visibility›, with the two extremes ‹invisible› and ‹obtrusive›. The blue dots show the ratings by three different viewers of the public transport map of the city of Basel (all in the area of ‹visible› – one closer to ‹eye-catching›, the other closer to ‹reserved›).*

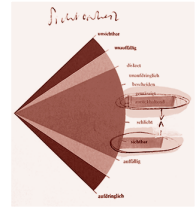


*Figure 5*→**XIII**
*Highlighted are two intended effects often found in public transport design manuals (‹reserved›, ‹visible›). The arrows indicate a conflict or contrast between these effects. This might identify a typical problem of public transport info mation design: information such as a timetable or rail track signpost must be visible, but at the same time tends towards restraint and clearly avoids any obtrusiveness.*

This way of putting things produced, besides a quite appealing and comprehensible way of visualising crucial concepts, two striking insights.

— Starting from the intended effects, there are always two directions in which a design can vary towards extremes, where the extremes are always clearly undesirable. In comparison with the well-known *semantic differential* scales showing a neutral scale between pairs of opposites (warm-cold, light-heavy etc.), the speedometer scales respect the diverse concepts between the opposites, go further into the extremes (warm – hot – burning – searing etc.) and include a dimension of appropriateness.

— The speedometer scales nicely illustrate that the intended effects in travel information design are mostly located somewhere in the middle. This is in accordance with the starting point of the project, the idea that information design acts rather moderately and from close to a rhetorical ‹zero point› (as on a numerical scale, zero can be put in the middle between plus and minus).

A third outcome was visualised by arranging the effects mentioned in the design manuals together with typical effects of commercial graphics within a visual coordinate system, depicting, on one axis, the dimensions *logos-ethos-pathos* and, on the other, the strength of the intended effect (cf. figure 6):



*Figure 6*→**XIII**
*Poster arranging the effects of public transport information design on a rhetorical matrix. Vertical axis: logos, ethos, pathos, horizontal axis: low, middle, high strength of effect. Blue: effects of public transport information design, purple: effects of commercial graphics, lime green: products of commercial graphics*



*Figure 7*→**XIII**
*‹Superordinate› effects of information design that refused positioning on the matrix in figure 6 (e.g. visible, comprehensive, informative, recognisable).*

— A slight (although not clear-cut) trend towards a correlation between *logos* and minimal strength, *ethos* and medium strength, *pathos* and maximal strength can be detected – made visible by the more or less diagonal arrangement of the effects (starting bottom left towards upper right).

— While effects and products of commercial graphics (purple and lime-green post-its) cover the whole range of effects and tend towards strong and *pathos*-based effects, the effects mentioned in public transport information design manuals (blue post-its) rarely reach a high strength level. The effects most commonly mentioned in the manuals (e.g. reserved, simple, clear, clean) are indeed mainly located bottom left, which means that they are *logos*-based effects with minimal strength.
— The process of arranging the different concepts in the rhetorical matrix contributed to the already mentioned insight that some of the effects described in the manuals seem to be superordinate goals and do not fit into the grid (e.g. visible, comprehensive, informative, recognisable; cf. figure 7).

## Visual Analysis

Parallel to the textual analysis, a visual analysis of several Swiss railway stations was carried out. About 500 pictures were taken on location – including close-ups and general views of whole arrangements and areas. The pictures were sorted and arranged by area (entrance area, passageways/shopping area, tracks) and type of information carrier (poster, screen, building, icon etc.). The aim was to get an overview of the different media and potential uses of information design at train stations. The material was also used to compare the intended effects found in the textual analysis and in expert interviews with the status quo of existing information design in Swiss railway stations: are the declared goals attained in practice?



*Figure 8*→**XIII**
*Detail of a collage of public transport information design found in various Swiss train stations, arranged by station area and type of information carrier (e.g. logo, clock, screen).*

## Expert Interviews

A further way to find out about the intended effects of public transport information design is to ask experts in the field. Qualitative guided interviews are currently being planned and conducted with five people responsible for design matters within public transport. The interview guidelines contain questions such as «What are the main aims/effects of public transport information design?», «Is informing people the sole effect or goal of information media such as signposts or timetables?» «What other effects could or should these information devices achieve?»

## Design Criteria

A milestone of project step 1 «analysis – expert interviews – synthesis» is to formulate a set of well-defined criteria for the conception of design variants that are going to be at the heart of project phase 2. The design variants will be created by the two communication designers in the project core team and will play a pivotal role: on the one hand, they will constitute the result of the analysis and theory building of step 1; on the other hand, they are to serve as a basis for the usability tests in step 2. In other words: the theses developed in the course of the first project phase will be ‹packed› into design objects and then be tested by showing the design variants to people within a test environment. The defining criteria should both ensure a smooth transfer from design theory (analysis/hypotheses) to design practice (design variants) and the testability of the resulting design variants (usability tests).

The main questions, currently being dealt with, are:
— What public transport information design objects should be chosen as basis for the design variants? And for what reasons?
— What are the rhetorical impacts the design variants should effectuate? And how can these best be realised?

## Choice of design objects

The choice of appropriate design objects has proved to be a crucial and time-consuming process. As mentioned before, the design variants serve a twofold role: they must allow the designer leeway for the implementation of different effects according to the defining criteria, and this has to be done in such a way that the built-in effects can afterwards be validated by means of usability tests. What is more, exorbitant time and effort spending for design and test phases has to be avoided (i.e. no redesign of a whole station concourse!). Two out of three information design objects to work with have already been chosen (one is still under discussion):
— Train departure timetable poster
— Train formation poster



*Figure 9*→**XIII**
*Chosen design objects: departure timetable (yellow) and train formation poster (blue).*

Just a brief remark on why these objects seem promising: the yellow timetable poster is a design classic and an indispensable piece of information for the traveller; first of all, however, it is the most ‹objective›, ostensibly non-rhetorical medium one can think of in public transport information design. To conceive of rhetorical variants is a challenge and a creative exploration we would not want to miss, although the creative freedom is rather restricted. The second design object, the train formation poster, has at no point been thoroughly conceived or designed by the SBB, so it leaves a lot of room for the designer with many options for design variants, such as rhetorical figures, colour change or even a modification of the information displayed.

## Definition of Intended Effects

For each of the chosen information design objects we plan to design three to five variants with an overall intention, plus each variant with a very specific additional goal or effect. To give an idea of what we expect of the different information design variants: they should
— operate on different rhetorical dimensions, e.g. impart objectivity (logos), security (ethos), joy of use (pathos);
— have different rhetorical strengths of effect;
— operate on competing rhetorical levels, e.g. completeness of information vs. clarity and simplicity of information.

## 3. Problems of Practice-based Research

Finally, I would like to point to some difficulties we have encountered in doing practice-based research that might occur in just the same – or analogous – ways to other researchers working in practice-based research projects. I am not going to define here what practice-based design research is. I rather suppose that the research project presented on the pages above is an example of practice-based research as it involves design practice as a heuristic: it develops design variants as ‹materialised hypotheses› and uses the designed objects to test the hypotheses (cf. section 2). The project has so far dealt with the following problems:

— How to compare textual and visual analyses: The study of visual rhetoric centrally involves visual material; the rhetorical concepts however come from the verbal field. It turned out difficult to find descriptions for the visual materials that were comparable with the textual analysis.

— How to apply design rules to information design: The design rules collected in the preliminary project were not straightforwardly applicable to information design. Many of the effects important in information design operate on a second-order level, where no simple design rule («effect x can be created by means a,b,c») can be indicated.

— How to pack hypotheses into a design: It is one thing to define possible effects of design, but quite another to actually materialise these ideas.

— How to vary ‹zero› effect design objects: In comparison to commercial graphics, the effects of information design are rather moderate. While it proved rather easy to generate clear-cut effects in commercial design variants (as we did in the preliminary project described in section 1), the variance of low-level effects is rather small and precision of effect hard to achieve.

— How to create design variants with ‹zero› leeway: What is more, pieces of public transport information design are often highly predefined by corporate design and must strictly meet the needs of the visually impaired. To find the necessary leeway for ‹realistic› design variants with different effects is a challenge.

— How to create and test highly context-dependent design objects: The items of public transport information used as basis for the design variants are normally found within the context of a railway station, acting together with other informational, commercial and constructional elements. How can contextual effects be controlled and tested? How could a complex setting such as a railway station hall be artificially created as a test environment? One idea to (at least partly) solve the problem might be to create and test large-size photomontages. If possible, at least one series of design variants will be tested on-site in their original context (if it is manageable to avoid high costs and unwanted effects). Many of the mentioned problems may reflect a gap between design theory and practice, or between textual and visual approaches, gaps that are not easy or sometimes even impossible to bridge.

### Conclusion

The pages above have hopefully provided a useful look into the Bern University of the Arts research project *Visual Rhetoric 2: Rules and Scope in Public Transport Information Design*. The aim was both to present the key parameters of the project and to explicate its theoretical basis, the visual/design rhetorical approach. Besides placing the project theme within the academic literature on information design and visual rhetoric, I hope to have exhibited tangible ways of applying visual/design rhetorical heuristics in practice-based research. That the link between theory and practice is not always easy to make is indicated by a range of problems that have occurred in the course of the practice-based research project.

## References


Bonsiepe, G. (1965). Visual/verbal rhetoric. ulm 14/15/16, 23-40.

Bonsiepe, G. (1996). Interface: Design neu begreifen. Mannheim: Bollmann.

Buchanan, R. (1985). Declaration by design: Rhetoric, argument, and demonstration in design practice. Design Issues, 2(1), 4-22.

Burmester, M., Hassenzahl, M., & Koller, F. (2002). Usability ist nicht alles - Wege zu attraktiven interaktiven Produkten. i-com, 1, 32-40.

Ehses, Hanno (1986). Design and rhetoric: An analysis of theatre posters. Design Papers 4, 1-36.

Horn, R. E. (2000). Information design: Emergence of a new profession. In R. E. Jacobson (Ed.), Information Design (pp. 15-34), Cambridge, MA: MIT Press.

Jaquet, Ch. (2008a). Corporate Design: Mehr als ein Logo, in W. Weber (Ed.), Kompendium Informationsdesign (pp. 83-122), Berlin: Springer.

Jaquet, Ch. (2008b). Sichtbare Rhetorik im Alltag - ein Augenschein. In G. Joost, & A. Scheuermann, (Eds.), Design als Rhetorik. Grundlagen, Positionen, Fallstudien (pp. 123-141), Basel: Birkhäuser.

Joost, G. (2006). Audio-visuelle Rhetorik und Informationsdesign. In M. Eibl, H. Reiterer, P. F. Stephan, & F. Thissen (Eds.), Knowledge media design: Theorie, Methodik, Praxis (pp. 211-224), München: Oldenbourg.

Joost, G., & Scheuermann, A. (Eds.) (2008). Design als Rhetorik. Grundlagen, Positionen, Fallstudien, Basel: Birkhäuser.

Kinross, R. (1985). The rhetoric of neutrality. Design Issues 2(2), 18-30.

Kostelnick, Ch. (2004). Melting-pot ideology, modernist aesthetics, and the emergence of graphical conventions: The statistical atlases of the United States, 1874-1925. In Ch. A. Hill, & M. Helmers (Eds.), Defining visual rhetorics (pp. 215-242), Mahwah, NJ: Lawrence Erlbaum.

Scheuermann, A. (2008a). Affekttechniken des Designs. In G. Joost, & A. Scheuermann, (Eds.), Design als Rhetorik. Grundlagen, Positionen, Fallstudien (pp. 205-212), Basel: Birkhäuser.

Scheuermann, A. (2008b): RailCity oder Hauptbahnhof? Eine designtheoretische Interpretation von Transportströmen und Einkaufserlebnissen im Hauptbahnhof Bern. archimaera 1(1), 105-111 [http://www.archimaera.de/2007/1/1201/archimaera001Scheuermann.pdf]

Schneller, A. (2009). Visual rhetoric in commercial graphics. In Swiss Design Network (Ed.), Multiple ways to design research: Research cases that reshape the design discipline (pp. 352-355), Milano: et al./Edizioni.

Schneller, A. (2010). Hypothesizing about design from the perspective of visual rhetoric. In R. Chow, W. Jonas, & G. Joost (Eds.), Questions, hypotheses & conjectures: Debates & discussions on projects by early stage and senior design researchers (pp. 255-263). iUniverse.

Stocker, K., & Weber, W. (2008). Was ist Informationsdesign? In W. Weber (Ed.), Kompendium Informationsdesign (pp. 3-21). Berlin: Springer.

Tufte, E. R. (2006). Beautiful Evidence. Cheshire, Ct: Graphics Press.

Thomas Müller FHNW HGK Gregor Naef
FHNW HGK Andreas Simon FHNW HGK, ansimon@gmail.com

# A Kid's Interface: Designing a Keyboard for Two Year Olds

Keywords: User Centered Design, Co-Design, Kids, Prototyping, Interaction Devices,

Keyboard, Prototype Laddering

Developing successful designs and interfaces for kids can be as difficult as it is rewarding. In our research, we have developed a keyboard for very young children, as a hardware interaction device and as an enabling tool for learning. Our design scenario for this device is that children, beginning with the age of two, can learn to use written language in the same cognitive development phase and at the same time as they acquire spoken language skills. We develop a design and research strategy for a user centered design practice with very young children. To maximize the impact of our observation sessions we use a progressive sequence of specifically developed prototypes as ‹embodied questions› in a research and design process we call *Prototype Laddering*. We produce an extensive set of design recommendations for a keyboard for two year olds and propose a set of preliminary guidelines for using *Prototype Laddering* as a research and design method with very young kids.

This work sets out to develop a general interface device for interaction with computers and future generation home media devices – TVs, audio systems and game consoles – that is aimed to be used by kids, potentially from a very early age. Specifically we develop a concept for a keyboard as a peripheral device that supports kids from the age of two to learn to write and read. With our design effort we present and explore a novel approach, *Prototype Laddering*, for researching and designing with children.

Peripheral interaction devices define a physical point of contact between people and machines. They define classes of interaction styles and have a great influence on the individual access and the use of computers and media devices. By separating the physical interface from the main hardware and from the software, peripheral interaction devices can be easily exchanged and replaced, are typically of limited cost, and allow people to adapt the use of computers and media devices to their own needs. This allows users to express individual preferences simply by plugging in devices that they like.

Researching the role of the physical interface for kids we find that practically all peripheral interaction devices are designed and produced for adults. This is the area where we find companies like Logitech (Logitech vision statement: The interface that links people and information will transform the way they work, learn, communicate and play.) that are specialized in designing and making physical interaction devices, as well as Microsoft and Apple that brand and design their own physical interfaces. Apart from the mainstream market we find a very limited number of small, specialized companies that develop peripheral devices for special needs. BigKeys produces a keyboard with a reduced number of very large keys to enable interaction with impaired vision and reduced motor ability that is primarily targeted at the elderly. Interestingly this keyboard is also used in preschools and seems better suited for kids than conventional keyboards. With very few exceptions, we do not find interaction devices that are specifically designed for kids and that reflect their specific needs and expectations.

When we see special devices designed for kids, the overwhelming majority is designed in the form of completely independent devices, as toys for entertainment and education that sometimes imitate ‹grown up› interfaces like laptops – much the same way as play kitchens or toy power tools mimic other areas of the grown up workplace. These Electronic Learning Products (ELP), often promise ‹smart play› as something to «help children learn while having fun» (VTech). Some of these toys can take on the form of animalistic robots and exhibit a particularly complex and rich physical interface, often with voice output and with the ability to use voice and gesture control.

We feel that having separate toy devices, instead of providing kids with good physical interfaces that are designed for them, unnecessarily excludes and separates kids from the ‹grown up› digital world. This may have been OK at a time when computers were the insignia of the workplace and were not as much a common part of everyday life as they are today. We think it is a good challenge to provide children with better access to our world in a way that respects their needs and that makes sense to them.

Doing research and designing with and for kids is a challenge. Very young children are not able to verbalize their thoughts and ideas, in particular when this concerns abstract concepts and actions, to make them readily accessible to adult researchers and to designers. Compared to adults they have a much more limited attention span and less inclination to follow instructions just because they are part of a study. Also, because of ethical considerations, it is much more difficult to get access to children and make them participants in a study or collaborators in a design effort. Another, perhaps even more fundamental difficulty is that ‹they› are simply so ‹other› from adults that the gap is just wider and there is even more stuff to explore and to learn from them.

Within this project we have explored a novel research and design strategy we call *Prototype Laddering* that tries to cope with some of the problems we face when designing with and for children. *Prototype Laddering* iteratively uses prototypes to formulate a sequence of embodied ‹questions› and ‹physical hypothesis›. The use of prototypes and the observation of a child's behavior represents a form of non-verbal communication that is highly suitable for very young children. Our approach attempts to maximize the value of the input by children participants in the design process and to maximize the rate of change and learning that we get from an observation. We are less concerned with discovering the absolute truth than with covering as much ground as possible; to «…discover what we did not know rather than try to confirm what we thought we already knew» (Scaife, Rogers 1999). We think that this approach to research can often match the objectives of design better than a more conventional research oriented paradigm.

## Previous Research

There exists a substantial body of research for design with and for kids, in particular within the interaction design and HCI (human computer interaction) communities. For a good overview and an introduction to the field see (Druin 2002). Druin has developed a taxonomy of roles that children can take on in a research and design process. These roles span from ‹user›, ‹tester›, to ‹informant› and ‹design partner›. Most of the research in the usability and human centered design community, and this is not limited to research with kids, is centered on techniques that treat people as a ‹user› and/or ‹tester›. Unfortunately, this approach is often better suited to ‹try to confirm what we thought we already knew›.

When looking at methods that engage participants more deeply, and that make more extensive use of prototypes, we find approaches like Bluebells (Kelly et al. 2006) and Cooperative Inquiry (Druin 1999). Bluebells aims to balance child-centered design (i.e. design by children) with expert design and focuses on the importance of providing a common context for design partners. In the taxonomy of Druin, our method of *Prototype Laddering* fits kids between the role of ‹tester› and ‹informant›, while the Bluebells approach stretches wider, to the roles of ‹informant› and ‹design partner›.

Most research on physical keyboard design is rather dated, however there is some more current research on the ergonomics of typing, often related to strain injuries (Swanson et al. 1997), and to the placement of additional keys and functions on the keyboard (McLoone et al. 2003). All of this research is aimed at adults, in general (at least implicitly) assuming a workplace setting. It is not very surprising to find no work on keyboard design for very young kids, since they are typically not expected to write. It is surprising however to find very little concern and practically no work on keyboard design for preschool and school children (Nicolson, Gardner 1985), (Plowman, Stephen 2005) in the literature.

## Mice for Kids

The literature on the use of computers in preschools confirms that the primary interface device for learning software aimed at the age group from three to five relies on a mouse-based GUI. This is confirmed by our own interviews with preschool educators. The dominance of the mouse as a primary hardware interface is somewhat surprising, since research shows that there are several cognitive and sensomotoric problems that younger children face when using pointing devices and GIUs (Jones 1991).

The dominance of mouse-based GUIs for kids is reflected in the rich research literature that is concerned with this topic. As an example of this type research we can look at work by Hourcade and his collaborators:

In a first study Hourcade et al. (2004a) identify that young children at the age of four have a significant problem with using multiple mouse buttons. As a consequence they suggest to «…provide the same functionality to all mouse buttons.» Another study involved 26 preschool children and 13 young adults (Hourcade et al. 2004b). This research shows that for young kids the mouse does not perform well and that using a mouse for pointing and clicking on small targets can be a very frustrating experience for children. The researchers speculate that this problem reflects a developmental process and shows a limitation in the reaction time for controlling visual motor tasks in young children. As a consequence Hourcade et al. argue that interactions should be «designed specifically for preschool children» using bigger and fewer targets. In another study with 50 four and five year old children (Hourcade et al. 2007) evaluate the advantages of smaller mice for kids. While smaller mice might make better ergonomic sense for smaller hands, they conclude that they have «found no statistically significant differences in accuracy or efficiency between the children who used small and regular-sized mice.»

In (Hourcade 2006) mouse event data is compared at the sub-movement level. This identifies a particular behavior that slows kids down when compared to adults. As a consequence of this analysis an algorithm to identify sub-movements to detect when participants have difficulty pointing near a target is proposed. This algorithm can run as a filter in the background of the mouse input, automatically triggering a precision pointing mode when kids have trouble hitting a target. Hourcade et al. (2008) evaluate this technique, Point Assist, in a study of 30 preschool children. Point Assist is a software-based filter to help young children with their specific interaction problems with computer mice. In the study it successfully removes mouse pointing problems near the

target that are typical for young children. In a later study with 20 older adults (ages 66-88) (Hourcade et al. 2010) PointAssist is shown to enhance pointing accuracy for this user group as well.

These research papers on mouse-based interaction for young children give us an impression of the strengths but also of the limitations of a conventional research approach for design. While the sequence of studies leads to a relevant result together with an in-depth understanding of the underlying problems, it is clearly not designed to deliver results ‹outside the box›. The participants in the study take on the role of ‹users› that have no influence on the definition of the problem. The design problem is generally identified as a deficiency when compared to ‹normal› capability and tracked down. A severe practical limitation for research with kids and other more ‹fringe› user groups is the large number of participants that is needed to conduct a meaningful quantitative research study.

## Advanced Design Scenario

We have developed a scenario for the use of a keyboard by very young children that is used to guide our design. The aim of developing this scenario is to place us firmly in new, uncharted territory for the design and for the intended use of a new peripheral interaction device. Our design scenario asks for researching and designing a keyboard for very young children from two years and up, that has the potential to enable children to learn written language alongside the acquisition of speech and verbal language with a computer or in digital media environment.

Keyboards and reading and writing text are an important part of the current digital world. Traditionally we associate reading and writing with older children and with learning in school. In part this may be just a consequence of traditionally connecting the learning of writing with writing by hand, which needs considerable motor skills that are difficult or impossible to learn at an early age. (Ironically this may be for the same reasons that make using the mouse surprisingly difficult for kids.)

In our scenario we start by thinking: what happens if very young children can learn to write using a keyboard, requiring much less manual skill than writing with a fountain pen. If kids learn to type early they could have much earlier access to effective software supported leaning to write and read. We could possibly try to place the learning of written language at a different stage of infant development, alongside to learning of verbal language with two years and up. In this sense writing could take on the role of something akin to the early acquisition of a second language.

While this may sound like stretching things a little too far, the learning of American Sign Language (ASL) already represents such a scenario that is relatively common. Not only do hearing children of deaf parents learn to sign and speak (Long 1981), (Strong 1988), there is also a growing movement of parents that teach hearing toddlers from 8 months and up a reduced dialect of ASL (Babies and SL). Here the motivation is not a hearing disability but the desire of parents to communicate non-verbally with their children before they are developmentally able to articulate speech (Acredolo, Goodwyn 1988).



## Prototype Laddering

In our design study we explore a research and design process we call *Prototype Laddering*. The main aim of *Prototype Laddering* is to maximize learning and feedback in a new area of design. The technique uses a sequence of prototypes that are evaluated and tried out by users and stakeholders. After each round of observations and feedback a new prototype is produced and evaluated to deepen the understanding in identified problem areas and to explore the challenges presented by the previous prototype. This process is similar in dynamic to a psychological interviewing technique called laddering (Reynolds, Gutman 1984) that aims at deepening the understanding of (hidden) mental attitudes by asking a sequence of questions and moving upward through the levels of abstraction.

With *Prototype Laddering* we make explicit use of the design prototype as a ‹physical hypothesis› that enables us to ‹build› certain ideas into the prototype and get an answer to a non-verbal question by observing the reaction with the participant. As a non-verbal form of communication between designer-researcher and participant this application of prototypes as embodied questions is obviously useful in situation where verbal communication is found difficult. This approach differs from the typical use of performance prototypes that are used to test and to make predictions about the performance and viability of a specific design idea and is closer to the role of designed artifacts in critical design (Dunne 1999), (Graver et al. 2003).

## Experiments

We have explored a bundle of design questions with a laddered series of four prototype sets and corresponding experimental evaluations. We were interested in the necessary properties of a keyboard to be attractive to a two year old: how can we attract attention and stretch the concentration span, how can we support the decoding of letter signs on a keyboard by focusing attention? The experiments were conducted with a two year old male child in his play room, in the presence of and accompanied by his mother. Each experimental phase was followed by an evaluation, bundling the observations with the current prototype to generate results and questions that were implemented in the next prototype for subsequent experimental evaluation. This process closely couples design and experimentation in a single flow.

### Stage 1

Goal of the first study phase was to find out what effort is needed to convince a two year old to accept a prop as a keyboard-like object and what importance size, pitch and color of the keyboard keys have in use. The duration of the observation phase was 45 minutes. Several prototypes were presented in this phase and after each presentation a small break was taken to sustain continued interest.

Prototypes used: A total of seven prototypes were presented, six of which were made out of Styrofoam board: three with flat, glued on printed paper keyboards and tree with relief indicating raised buttons. The prototypes differed in size, shape, and arrangement of the keys, ranging from 40x15mm, 25x25mm to small index finger size of 10x10mm. Prototype 7 was a commercially available learning computer for kids with foil keyboard and a paper layout.



Figure 1→**XIV**
*Some of the prototypes developed for stage 1*

Observations: The flat printed keyboards were not used at all. Even with the intervention of the mother and explicit demonstration to motivate the child, more than a single key press did not happen. Raised keys with relief were clearly better recognized and pressed multiple times. The frustration that the keys did not really work was still obvious since the child started ripping the keys from the keyboard and used the board as a projectile. In spite of its interactive audio capabilities, the commercial learning computer also did not really excite the child. Only the activation button, standing out clearly in color, position and relief, distinct from the rest of the foil keyboard, got sufficient attention and was used enthusiastically. Finally, the subject started playing with another toy that he had found in his room: A large plastic book with a large glowing knob that allowed to play different songs. Three different actions for pressing keys were observable: clicking with the index finger, hitting with the palm and pushing with the thumb. The rest of the fingers or the hand would often also touch the keyboard. It was surprising to see the precision in the selection of different keys, still with the flat keyboard the fingers were always off and between the keys, touching multiple keys at once.

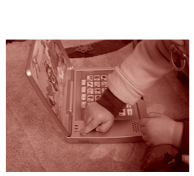


Figure 2→**XIV**
*Activation button standing out in colour, position and relief, was used enthusiastically, the flat keyboard was ignored*



Figure 3→**XIV**
*The mother tries to motivate the child to press a button on a flat keyboard*



Figure 4→**XIV**
*Tearing off keys is more interesting than pressing them, especially if they don't work*

Interpretation: Even explicit demonstration is not sufficient to make a keyboard believable, colors and shapes are not enough to simulate a keyboard: an interaction has to work (or needs to be simulated). Keys and letters need to be glued on securely, otherwise picking them off is more interesting than pressing them when nothing happens otherwise. It seems to be reflexive: if nothing happens from push, it must be possible to pull. On a flat printed keyboard it seems to be difficult to perceive distinct keys. There is an affinity to using the index finger from an early age, hitting with the palm or using the thumb allows to exert more force. Since multiple fingers often touch the keyboard simultaneously, the pressure point is decisive for suppressing possible entry errors.



When presenting multiple prototypes in a single session we see a tendency to rush, attention easily jumps from the current prototype, ahead to the eagerly awaited next thing.

Conclusions for phase 2: Interaction has to be simulated, after the key press a reaction must follow, otherwise the prototype is not believable and useful. An integrated speaker with the ability to manually trigger a sound is a viable solution. If possible, multiple prototypes need to be introduced and presented together.

## Stage 2

Goal for the second study phase is to evaluate if a simulated interaction by playing audio files is sufficient to maintain the attention of the child so that he presses multiple keys. Glued on buttons shall clarify how important the haptics is for children to perceive a key and to enable precise selection. The duration of the observation phase was 30 minutes.

Prototypes used: A prototype was instrumented with speakers to simulate interaction. Music and sounds are manually triggered from a laptop. In addition, on the commercial learning computer and on the flat keyboards raised Styrofoam keys were glued on.



Figure 5→**XIV**
*Prototype with built in speakers (reverse). Sounds triggered manually to simulate interaction*

Observations: The simulation of an interaction by pressing buttons on the prototype and by playing music on the speakers could be observed. Also the raised keys on the leaning computer were observed better and other keys than the activation button were now pressed. The prototypes with flat keyboards were not even touched. Still, this phase was not very successful since the child was too tired and not willing to engage in the experiments. The attention span was even more limited than expected.



Figure 6→**XV**
*Learning computer with covered activation button, new surface and keys added*

Interpretation: Flat keyboards are not attractive to two year olds. Even though the child showed only limited enthusiasm for the task, the raised keys with better haptics were now recognized and he reacted to keys he had previously ignored.

Conclusions for phase 3: Since many prototypes were ignored in the current experiment (due to fatigue), all prototypes will be shown again in the next phase. A new prototype that has keys with travel and pressure point will be produced.

## Stage 3

Goal for the third study phase was to retest all previous models. In addition a functional keyboard by BigKeys was used to record which keys on a keyboard will be pressed. This observation phase took 90 minutes.

Prototypes used: All 7 previous prototypes, in addition a new Styrofoam keyboard simulating travel and pressure point, and a functional BigKeys keyboard writing into a word application with 72 point type.

Observations: This time the participant was ready to intervene. The prototype with the integrated speakers even motivated him to dance. As the music stopped he pressed the same key again to play the music, multiple times. The Styrofoam keyboard with key travel was used extensively even without audio simulation. Both keyboards got enough attention that the child started changing his position and started carrying the keyboards around in the room. Keys separated by color were pressed more often than all others. It was surprising to see the participant actively using the BigKeys keyboard, just because something happened on the screen. Option keys presented a problem as they were often pressed. Feedback prompted the child to press the same keys repeatedly. As the speed of the feedback became more interesting than producing single letters, the participant started to hit the keyboard with his whole hand.



*Figure 7*→**XV**
*Prototype with integrated speakers to simulate an interaction through replayed audio files*



*Figure 8*→**XV**
*Prototype with keys using pressure points made out of foam*

Interpretation: Big keys and large pitch make it more likely that kids are tempted to hit the keys with the palm or to use the whole hand. The size of the keys and their pitch does not make a big difference between prototypes, it is more important what happens immediately when a key is pressed. The interaction needs to fill the keys with content. ‹Boring› keys will not be used, colored keys (red in particular) are more attractive. Smaller keys seem to be less of a problem than typically assumed, to the contrary they seem to motivate children to concentrate on single keys rather than on the whole keyboard. Smaller keys may reduce hitting the keyboard indiscriminately with the whole hand. Children want to carry a keyboard like any other plaything, they want to be able to play everywhere. There is no separated play area for this age group. Size and weight of the keyboard play a role for a two year old, if it fits and is easy to grab and move. The dancing and replaying makes it clear that the prototype simulation is sufficient to make the keyboard believable. The keyboard with key travel and pressure point was interesting enough to grab the attention without audio or further feedback. Children seem to like movable buttons.

Conclusions for phase 4: Enough design parameters are relevant so that it seems useful to consolidate these results in a single prototype. Are there other design parameters except form, size and color that can generate and focus attention?

Stage 4

At this point only a single prototype was tested. The goal is to consolidate previously obtained results with this prototype. In addition, glowing keys were researched, to investigate if they can help to concentrate primary attention on specific keys, stronger than through the use of color. In addition, a raised and embossed letter relief was explored. The duration of the observation was 30 minutes.

Prototype used: This single prototype had a higher material quality than all previous prototypes, with molded keys with raised and embossed letters. The model has a lacquered surface finish and the keys have significant travel and pressure points, combined with built in speakers for direct feedback, all combined in a single prototype.

Observation: The child seems to find the keyboard attractive. It is used intensively and carried around in the room although only rarely more than tree keys are pressed. It seems more interesting to listen to the music than to press buttons. The variety of sounds and music leads to an extended concentration span that seems to please the child. After about 15 minutes he suddenly realizes that the sounds are triggered manually from a nearby computer. He understands quickly that the computer is connected to the keyboard and that it is possible to trigger a sound on his keyboard with the space key of the computer. Still he returns to his keyboard and presses the keys there.



*Figure 9*→**XV**
*Child comfortable with keyboard prototype*

Interpretation: Glowing keys have only a partial effect to focus attention. There is no conclusion on using relief for the letters. As a plaything the prototype keyboard with simulated audio interaction in the current form is attractive enough to focus the attention of the participant for 20 minutes. The kid would have liked very much to keep the prototype.

Results from phase 4: The prototype needs to be simplified to test single identifiable properties, there have been too many changes to evaluate particular effects with this prototype. Overall the prototype has been successful in being attractive for a two year old and in successfully simulating a working device.

## Results

From the series of prototype evaluations we can draw a number of results. Our observations have given us significant insight into the parameters of a keyboard design for very young children. Also we have explored a novel technique, *Prototype Laddering*, to use a series of prototypes to iteratively explore and deepen a design scenario. From the current research we can draw some preliminary conclusions and suggest guidelines for the use of this method for research and design with young children.

Results for keyboard design:

— Enough free space (pitch) between keys can reduce input errors, recommendable more than 2mm.
— Large buttons lead children to trigger buttons inaccurately, slapping with the whole hand or with their palm.
— Immediate response with a visual or auditory signal is necessary for interaction. If nothing happens it confuses children and they quickly lose interest.

— Feedback in the interaction is more important than the color or the shape of the keys. Kids remember keys by position.
— Feel, travel and pressure point of the keys is important, to sustain interest and to minimize errors from touching other keys with the hand on the keyboard.
— Flat printed keyboards are hard to recognize and not interesting.
— Colorful, bright buttons are attractive, arouse curiosity and offer an opportunity to guide two year old children through a certain exercise or a program.
— The keyboard needs to be simplified to a minimum number of keys for clarity. A possible solution would be to work with removable keys. The keyboard can be reduced in the beginning to a few words or sounds.
— Children want to carry the keyboard around independently, like any other toy. They want to choose the location of the play area by themselves.
— The keyboard should be wireless and also function independently of a computer as an autonomous device. It has to provide independent interaction and feedback.
— The design must meet the requirements of the style of play for two year olds:
  · no sharp edges,
  · grips in various ways as each child has personal preferences how to grab something,
  · light weight, not too big, to be carried around by small children,
  · good stability to stand stable on different surfaces,
  · tough enough to withstand occasional throws, kicks or a child standing on it without any serious damage.

Results for *Prototype Laddering*:
— Small kids need more than a simple shape model to react to a prototype in a meaningful way. A number of steps are needed to convince children of the realness of a prototype.
— It is not possible to ask two year olds to pretend that a prototype is working.
— It is necessary to observe reactions acutely and to do a careful interpretation of the behavior, as this is the only guideline, we can't just ask what is going on.
— Kids give very authentic feedback of their attitude towards objects.
Example: With one of the prototypes the triggering of music by a key was simulated and the child started to dance. When the music stopped the child ran back to the keyboard and pressed the key again.
— A sequence of prototypes that step by step deepens understanding of the problem is crucial.
Example: In the first test phase, we have noticed that the subject is not interacting with the keyboard of an ordinary children computer. The paper skin of the foil keyboard was not nearly as bright and exposed as the activation button. In the next prototype we manipulated the keyboard by covering the bright activation button and by adding keys to the paper skin of the foil keyboard. This led to the reaction that the activation button immediately was not as important as the keys. (A conclusion from this observation is that colour, brightness and touch are essential issues to attract young children and that they might have difficulties in recognizing a foil keyboard.)



To use Prototype Laddering in future research with young children, we propose the following guidelines:
— To start out it is recommendable to use prototypes that include only a limited number of functions. Otherwise it becomes hard to discover when and why the child has difficulties to use the prototype.
— It is of advantage to begin with simple prototypes and then increase the complexity.
— At each single stage in the process it's necessary to observe the facts and develop a useful interpretation of the reaction of the children.
— Different prototypes within the same stage might help to collect answers and to generate new hypothesis from different perspectives.
— Keep in mind that children are usually not able to verbalize their feelings so you have to get a feeling for their body language.
— It is essential to react on an interpretation with the design and implementation of a new prototype referring to the already obtained results. This helps to get the process running and also keeps children curious enough to interact with the prototypes for the next stage.
— The prototypes are similar to a blank page of a questionnaire, they are the tools of communication.
— The children are the informants or co-designers so treat them with patience. It is absolutely normal that there are days where they are not in the mood. Sometimes this can be unpredictable.

## Conclusion

We have developed a keyboard for very young children, as a hardware interaction device and as an enabling tool for learning. The design scenario for this device is that children, beginning with the age of two, can learn to use written language in the same cognitive development phase and at the same time as they acquire spoken language skills. We have successfully used a research and design strategy called *Prototype Laddering* that uses a coordinated sequence of prototypes as embodied questions to probe a design problem. This approach is aimed at making very fast process in a specific design oriented research domain and to enable an effective non-verbal communication between designer-researcher and participant that is suitable for very young kids. We feel that combining *Prototype Laddering* with an advanced design scenario acts as a capable design oriented research strategy.

Using *Prototype Laddering* in our study we were able to produce an extensive set of design recommendations for a keyboard for two year olds that covers a wide area of the design problem. From our study we are able to propose a set of preliminary guidelines for using *Prototype Laddering* as a research and design method with very young kids. We feel that this technique is a promising tool for design problems where we want to cover a lot of ground in our research quickly. The ability to completely rely on non-verbal communication for prototyping and behavior observation makes this technique very suitable for research and design with very young kids.

From our initial experience we expect that Prototype Laddering as a research strategy can be very effective with adults also, specifically since it allows to

complement or to completely bypass verbal feedback. In future work we would like to explore the effectiveness of Prototype Laddering with different user groups and in other research settings. Since producing a laddered series of effective prototypes appears crucial for the success of the method, in future work we will develop specific guidelines for prototype design. We will use the design recommendations to design and build a fully functional keyboard as a peripheral device for two year olds to allow experimentation with suitable learning software.

*Prototype Laddering:*
*A Laddering Interview is using a series of questions, immediately building on the previous answer, to deepen the understanding for a specific behavior or motivation. We use a sequence of specifically developed prototypes, using the prototypes as questions, to explore the understanding for the properties of the prototype and to deepen the understanding for the behavior of a person with the prototype.*
*Q: I have used prototypes before, what's the big deal?*
*A: No big deal, really, prototypes are good. Usually they are used to identify problems and make sure you fixed them. In Prototype Laddering we use prototypes as questions and behavior as answers in a staged process. We continue to escalate the uncertainty at each stage to make sure we find new stuff.*

## Acknowledgment

Part of this research was developed in the class of the Masterstudio Design at the FHNW HGK in Basel. We would like to thank the participating boy and his mother for their participation in the study. We thank every student, teacher and staff at the Masterstudio Design who helped us in any way, the Institute of Industrial Design in Aarau for permission to use their workshop, and Adolf Flüeli for his vision, support and inspiration for this research.

## References

Acredolo, L., Goodwyn, S. (1988). Symbolic Gesturing in Normal Infants Child Development, Vol. 59, No. 2. (Apr., 1988), pp. 450-466.

Druin, A. (1999). Cooperative inquiry: developing new technologies for children with children. In Proceedings of CHI '99. ACM, New York, NY, 592-599.

Druin, A. (2002). The Role of Children in the Design of New Technology. Behaviour and Information Technology, 21(1), pp. 1-25.

Dunne, A. (1999). Hertzian tales: Electronic products, aesthetic experience and critical design. London, RCACRD Research Publications, 1999.

Gaver, W., Beaver, J., Benford, S. (2003). Ambiguity as a resource for design. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Ft. Lauderdale, Florida, USA, April 05 - 10, 2003). CHI '03. ACM, New York, NY, 233-240.

Hourcade, J., Bederson, B., Druin, A. (2004a). Preschool Children's Use of Mouse Buttons. Extended Abstracts of Human Factors in Computing Systems (CHI 2004), ACM Press, pp. 1411-1412.

Hourcade, J., Bederson, B., Druin, A., and Guimbretiere, F. (2004b). Differences in Pointing Task Performance Between Preschool Children and Adults Using Mice. ACM Transactions on Computer-Human Interaction, 11(4), 357-386.

Hourcade, J.P. (2006). Learning from Preschool Children's Pointing Sub-Movements. Proceedings of Interaction Design and Children (IDC 2006). ACM Press: pp. 65-72.

Hourcade, J.P., Crowther, M. and Hunt, L. (2007). Does mouse size affect study and evaluation results? A study comparing preschool children's performance with small and regular-sized mice. Proceedings of Interaction Design and Children 2007. ACM Press: pp. 109-116.

Hourcade, J.P., Perry, K.B. and Sharma, A. (2008). PointAssist: Helping Four Year Olds Point with Ease. Proceedings of Interaction Design and Children 2008. ACM Press: pp. 202-209.

Hourcade, J.P., Nguyen, C.M., Perry, K.B. and Denburg, N.L. (2010). PointAssist for Older Adults: Analyzing Sub-Movement Characteristics to Aid in Pointing Tasks. Proceedings of CHI 2010, ACM Conference on Human Factors in Computing Systems. ACM Press: pp. 1115-1124.

Jones, T. (1991). An empirical study of children's use of computer pointing devices. J. Educ. Comput. Res. 7, 1, 61-76.

Kelly, S.R., Mazzone, E., Horton, M., Read, J.C. (2006). Bluebells: A Design Method for Child-Centred Product Development. In: Proceedings of NordiCHI 2006 ACM Press.

Long, M. H. (1981). Input, interaction, and second-language acquisition. Annals of the New York Academy of Sciences, 379: 259-278.

McLoone, H., Hinckley, K., and Cutrell, E. (2003). Bimanual interaction on the Microsoft Office Keyboard. INTERACT. 49-56.

Nicolson, R., and Gardner, P. (1985). The QWERTY keyboard hampers schoolchildren. British J. Psy. 76,. 525-531.

Plowman L., Stephen C. (2005) Children, play and computers in pre-school education. British Journal of Educational Technology 36 2 145-158.

Reynolds, T., Gutman, J. (1984). Laddering: Extending the Repertory Grid Methodology to Construct Attribute-Consequence-Value Hierarchies. In Personal Values and Consumer Psychology, Vol II., R. Pitts and A. Woodside, eds. Lexington, MA: Lexington Books, 1984.

Scaife, M., Rogers, Y. (1999). Kids as informants: Telling us what we didn't know or confirming what we knew already. In A. Druin (Ed.), The design of children's technology. (pp. 27-50). San Francisco: Morgan Kaufmann Publishers.

Strong, M. (1988). Language Learning and Deafness. New York: Cambridge University Press.

Swanson, N., Galinsky, T., Cole, L., Pan, C., Sauter, S. (1997). The impact of keyboard design on comfort and productivity in a textentry task. Appl Ergon 1997 Feb;28(1): 9-16.

Babies and SL: http://www.babies-and-sign-language.com/

Anusha Iyer Laurea University of Applied Sciences, Espoo & Media Lab, Aalto University School of Art and Design, Helsinki, Finland, i.anusha@gmail.com Dries De Roeck Centre for User Experience Research, K.U.Leuven & Artesis University College, Antwerp, Belgium, dries.deroeck@artesis.be

# Empowering people to connect & create with smart technology

Keywords: DiY, user experience, social, community, sensors, smart technology, building blocks, daily life, users, objects, interface

DiY is a culture that has been prevalent in some parts of the western world since the 1950's. Numerous publications and communities are out there engaging in various DiY related activities. As the world is moving towards the internet-of-things and smart technology like sensors and RFID tags would soon enter various avenues of daily life, it could open up possibilities for individuals to create their own smart space and objects instead of letting industries do it for them. This could prove to be an economical, ecological and an empowering system. Therefore a DiY attitude towards smart technology by an ordinary person, who does not fall into a stereotype of a ‹techie›, is being explored. There are a number of questions as to why an everyday person would engage in DiY with smart technology and how would it be possible to encourage them. This paper addresses those questions by delving into the psyche of a DiYer and finding ways to enable this to happen in the future.



In recent years several publications, speculations and concept generations have been made around the topic of pervasive computing[1,2,3]. Pervasive computing is often interpreted as an invisible system[2,7] being in place for people to be subjected to. This paper instead toys with the idea of a system that consists of technology available as building blocks to allow for personalisation of smart environments. An ‹everyday› person should be able to plug sensors and tags to ‹everyday› objects, thereby giving them more meaning and value. By being able to do this, they would feel empowered in a ready-made world and such systems would encourage sustainability in a growing digital consumerism world, in more ways than one. The research is based on the EU wide ITEA2 Do-It-Yourself Smart Experiences (DiYSE) project. The aim of this project is to enable people to create their own smart environment, thereby obtaining a social and interactive experience at home or in the city[4]. Although the Finnish part of the project aims at the intellectually disabled people, this paper draws from the project and poses challenges and questions in getting an everyday person to be a DiYer with smart technology. It attempts at pointing out characteristics of a DiYer. It also shows the research that tries to answer the questions about this topic and paints a futurescape addressing the challenges.

## Research

There were a few objectives to our research. One was to discover how people react to sensors and if they are curious about the working of a device. Another was to understand DiYness and what makes people get involved in DiY activities. Since our aim is to get everyday people to DiY, it was important to find out if this can be done in the first place. To understand that, another objective of our research was to find out what constitutes a DiYer and their motivation to do so. Lastly it was also important to uncover and address the challenges in making DiY possible for everyday people.

### Reaction to sensors through low-fidelity prototyping

A rehabilitation centre for the intellectually disabled, Rinnekoti-Säätiö, is one of the Finnish partners in the DiYSE project. The project workshops, user observation and adapted co-design techniques have generated some music creation concepts. The concept would allow the end-users, here the intellectually disabled people at Rinnekoti, to be able to create music by using simple gestures or physically interacting with sensors. Using and interacting with sensors requires a cognition and hand-eye coordination that is not very common to daily practices. Therefore the first step to evaluating the music concept was to determine how the users react to sensors and gestures related to them.

A two day workshop was set up for this research. An entire day was set aside for creating simple objects by doing physical computing and then creating the physical interface for them. These objects were created using open source DiY toolkits and programming applications. Arduino micro-controller boards were used along with a couple of light sensors or photo-resistors and a slide sensor. The coding was a mashup of existing patches from online communities of Processing, Arduino and Pure Data. The outcome of the physical computing day was two music creation devices that the users got to play with. One device was a combination of light sensor, slide sensor, Arduino and Pure Data.

It acted like a DJ table where sliding ones fingers over the sensor changed the tempo of the sound output, while moving ones hands over the light sensor changed the pitch [Fig. 1]. The other device only employed a light sensor and an Arduino board, but was programmed using Processing and a sound library Sonia. Moving ones hands over the light sensor changed the volume of the sound output and modified the visual on the screen simultaneously.



*Figure 1* →**XVI**
*Slide sensor being tried out by an end-user at Rinnekoti-Säätiö*

All participants enjoyed trying out the devices, although some found it difficult to activate them because the interaction was not clear to them. The devices had an effect on them that can be compared to that produced by a magic show. It caused delight, amusement and wonder amongst the participants. Therefore it was clear that sensor based devices had a positive effect on them. Not one of them wondered or showed curiosity over the working of the devices though. If they had found out that a difference in light falling on the sensor caused the sound and visuals to change, the way of interaction with the device would've been clearer. It might have triggered novel ways of interacting with the devices. It became clear that an average person is only interested in using what is given to them. Few wonder about how the feedback occurs. The fascination over the feedback caused by their action precedes their curiosity to uncover its working. Nonetheless, it should be kept in mind that in the context of a workshop, one tends to do as instructed and participation can be restrictive.

### Shoes-on research

To understand the user's mind and attitude, one needs to get into their shoes to experience the thoughts and reasons behind certain actions by them. DiY for smart technology is a niche group in the DiY eco-system. Therefore as part of this research, the research team is immersing themselves in the DiY attitude, applying creativity to changing and enhancing personal spaces. The research team has some limited knowledge of physical computing and programming, through design education and interest in interactivity. Using existing and available materials, resources and knowledge, the team thought of ways to use sensors and turn their ambience interactive. This was done as a natural progression of the project and due to growing interest in smart technology and its uses, and not as a forced activity.
A door sensor with a room freshner was put together, to make the arrival and exit of people from the room an interesting and almost amusing event [Fig. 2]. In another instance, the summer white nights of Helsinki was thought to be of interest. With curtains drawn due to harsh summer light, one rarely realises when daylight turns to darkness. Therefore an attempt was made to turn the room's curtain interactive, by placing a light sensor to the window and LED pinned to the curtain, that would indicate nightfall by glowing.



*Figure 2* →**XVI**
*Door sensor with air freshner.*

This research helped the team understand the challenges in realising simple interactive ideas using current DiY toolkits. This, knowing some amount of the programs and being familiar with the functions of sensor technology. It made the team realise the challenges an everyday user can face if they were to try out DiY with smart technology.

### Insights through conversations

To uncover who a DiYer really is, it was important to have conversations with them that shed light on their personality and background. Casual, unscheduled and one-on-one conversations were held with DiYers in natural contexts of the researcher and the researched. These people were found to be DiYers through basic interrogative conversation and some amount of knowledge of their activities beforehand. The objective of the conversations was clear on our part, but the nature of it seemed naturally curious to them. Researcher and DiYer both tried to trace back to when they started getting into a habit or hobby of DiY. Also what could have been the possible reasons for them to do things themselves and trying to get a grasp of their character set. Certain insights gathered from shoes-on research and prototyping workshop got validated through these conversations.

## The DiYer and what drives them to be

When looking for ways to get an everyday person to become a DiYer with smart technology, it becomes important to understand why DiYers involve themselves in DiY activities, what kind of character set they possess and the key driving forces. This will help in understanding the challenges that lie in designing interactions and services revolving around DiY.

### Who is a DiYer?

Individual conversations with DiYers brought out patterns in their characteristics and helped seek commonalities in ourselves as we delved in DiY, through shoes-on research. The profile of a typical DiYer consists of the following characteristics.
They are self-reliant people, who like doing things for themselves and are independent in their thinking and actions. They enjoy hands-on work and love taking up projects that involve doing that. They tend to be restless individuals constantly seeking a project to involve themselves in. They have a constructive mindset that seeks to build. They are usually process oriented over result oriented, taking pride in the actions they perform more than the outcome. Although these characteristics may seem common, DiYers are a special bunch of individuals who seem to be wired differently. Some DiYers may have grown to be that due to circumstances whilst growing up. Certain factors and individuals may have influenced and induced the DiY attitude in them. For instance someone who played with building toys like Meccano and LEGO sets or had a parent who was a DiYer, is much more likely to grow into a DiYer themself.

### What drives one to DiY?

The insights and characteristics gathered from conversations with DiYers, was analysed to go to the heart of the matter and find out what drives people to DiY. The factors that drive people to DiY are need, knowledge and curiosity. The drive to then actually ‹do› something comes from the fact that they love doing. Knowledge and curiosity can feed into each other, but often it is need

that sprouts them. If we move the subject to focus on DiY for technology, then the need arises from the fact that people do not want to spend on fixing broken gadgets or buying devices that they can make themselves. Their love for technology drives them to curiosity and therefore gaining some knowledge. In this case it could be programming and building circuits. They are curious to know how a device works and what goes into it. By knowing the rules one can break them, therefore they modify applications and devices to function the way they want it to.
People's drives can be classified into three kinds [Fig. 3]. On one side is ‹do not wish to spend›, the other side is ‹love for technology› and right in the middle is ‹love for doing›. The ones who do not wish to spend money on buying or fixing, either live without buying or getting things fixed or buy cheap. They find cheaper alternatives of getting what they want for instance from second hand stores. The ones who love technology, could read about, buy new gadgets and get curious to understand the working of a technology, enough to know how to modify or fix if broken. They may not necessarily do anything. But the ones right in the intersection of the two drives, that is the people who love doing, are the ones who irrespective of a strong need or deep knowledge of the workings of a technology become DiYers of it.




*Figure 3*→**XVI**
*Mapping the driving forces of DiY attitude and its effects.*

Consider a scenario that would clarify the profile of a DiYer and what drives them to be one. Jack is an enterprise architect, but has a little studio set up in his home, where he fixes and makes little gadgets in his free time. He fixed a light bulb as a 4 year old and helped his father build and repair parts of their home as a child. His favourite toy was his Meccano set and he even purchased a Lego Mindstorm a few years ago as a young adult. His love for electronics made him take up radio engineering after high school. During his engineering studies he would love fixing people's radios and mp3 players. If they didn't want their old broken ones, he would fix them and make them his own. He was a music junkie who had earphones plugged in all the time. He knew how to fix and create mp3 players for himself, so he didn't have to buy a new one every time one broke or died. His love for doing and building arose as he was growing up. His need for not spending money on a new mp3 player arose from the fact that he was an avid listener and couldn't afford to buy a new one every time it died. His love for doing and his curiosity of technology, drove him to take up engineering that gave him knowledge. Therefore he knows about sensors and how to make use of them to suit his purpose.

## People and Smart technology

Sensor based smart technology is getting increasingly accessible for less technically skilled people. Easily available open source DiY toolkits like Arduino are meant for non-technical hobbyists to engage with[5]. Therefore it is slowly becoming commonplace for people to create new things by mixing and matching digital components in a similar way that they refurbish their houses or create non-digital objects themselves, like knitting or building with Lego blocks[6]. Till date though, the usage is mostly seen at the level of tech-art or research projects. Mainstream usage by everyday people is yet to be seen for it is still a challenge for them to imagine the way smart technology could benefit their lives[1]. The research done so far pointed out a few challenges and opportunities in at least five domains:

### Technological
Current DiY toolkits require a basic understanding of programming knowledge to be able to use them. There is a need to create a whole new type of graphical and physical interface for current tool kits[5] to enable non technical people to use and understand, so they can make the most of it.

### Economical
The concept of mass customization has already been proven to be profitable in economic research, but it would require a shift in the state of mind of today's companies and stakeholders[8].

### Ecological
If people started creating for themselves, it would be anti-consumerism of sorts that would help in reducing the number of companies and ventures putting out a variety of readymade products and services. Also, a system using RFID tags and sensors on everyday objects, can make consumption of goods more effecient and ecological interventions can be made in a product's life cycle by monitoring it[9].

### Social
Web 2.0 has paved way for online communities, where one can get assistance, help and a place to share once something is created. DiY communities tend to have an identity and people who are part of it, seem to fall into categories. The current electronic and hacking communities, seem to be driven by so called ‹geeks›[6]. The challenge here lies in getting an everyday person to make use of a community to create their own life enhancing objects.

### Design
People with different cultural backgrounds, capabilities or personal tastes should feel addressed in a design involving DiY. The design of the system or service should be such that ordinary people should get interested in it, get inspired say by people from the community to engage in the activities and be able to innovate with it. To be able to draw people into DiY activities, this challenge should be tackled from within, by addressing the driving forces of need, curiosity and knowledge and combining the successful elements from the factors above. The question of ‹what is in it for them and how does it bring value to them› should be answered.
We can be creative using the tools we know, as we possess the knowledge of its possibilities and constraints. Therefore to initiate a DiY mindset amongst non-technical and non-DiY people, it would be important to first teach them the language and make them aware of the possibilities. Also it would be important to connect them to the existing community of DiYers, to let them know they are not alone and that help will be available. Currently a number of research labs and organisations[15] are working to impart this knowledge to everyday people, in trying to empower them to becoming innovators.

### Painting the futurescape

Current scenarios of day-to-day life does not include or require as much smart technology. Today's everyday person is not aware of what is technologically possible. There is a lot of technological innovation going on and it is what one can call, future-ready. But the market is not. Therefore it is difficult to envision a DiYSE in today's life. It is if anything a vision of the future.

The state-of-the-art in smart technology and related fields allow sensors and RFID tags to be printed. Nanotechnology is shrinking to allow for miniscu-lisation and optimisation of high technology. Advanced IP versions can allow for every object to have its own IP address. It is already possible to print in 3 dimensions, almost like imaginging an object and getting it fabricated right at home. In future, the air may be ridden with radio frequencies and wireless networks that are perpetual, constant and consistent, allowing for every per-son and object to communicate with each other by catching frequencies freely from air. All these innovations and others that are yet to be seen, will change the way we think and do.

As far as the ecological situation of the globe is concerned, we're already in the 11th hour and it's been announced enough number of times, by a number of people and organisations that a change in attitude and action is needed. Painting the futurescape, a change in consumerism attitude is needed by one and all irrespective of demographics. Future envisioning studies talk about using smart pervasive technology to create a sustainable eco-system of goods. Therefore a gradual shift in everyday person's attitude towards consumption and usage through self-customised creation of smart space and objects would be fruitful in many ways.

### Future scenario

Based on the challenges and motivation drivers uncovered through research a suggestion for a future scenario is outlined below.

Imagine a world or even a unit say a family, a studio, a shop or business having a kit consisting of sensors, actuators, readers, tags, microcontrollers etc. The form of these components could be such that they can blend or latch onto any object, thus turning an ordinary object into something interactive and more useful. According to Bruce Sterling, the heroes of ubiquitous computing are everyday objects and not the tags and sensors[9]. He calls such objects, Spime. The electronic components could be in printed 2D form to be able to latch on easily, almost like a sticker. These objects can then become aware of each other and can communicate, similar to the modular computing suggested by Siftables[10]. All this would be devoid of wires and the physical interface even in 2D form would be pleasing, easy to understand and toy with.

It may not necessarily have a graphical user interface on a computer like device to allow the users to activate and assign the functions. Even if it does, the GUI should be organic, natural and in the current sense of terms it could employ drag and drop functionalities[11]. There could be other novel ways of deploying and assigning functions to the smart objects – say through voice. This would allow even the most non-technical person to create a smart experience in a humanised way without dealing with cognitive load.

Any assistance, help or questions that they may have can be found through an online community of experts and enthusiasts who are more than willing to be reached and taken help from. The community can also help in idea generation and it can be a space for enthusiasts to exercise their skills and creativity. It has an empowering effect on the enthusiasts and they do it for prestige and the greater good of society. In the future even the method of seeking help could be different, that cannot be envisioned right away.

Most people tend to seek information and want to get notified. This could be the biggest purpose of turning their environment smart. It could save time, money and life could become more efficient. They can also use smart tech-nology for getting entertained as well as to create entertainment.

It can be an open source eco-system which encourages users to share their innovations, thereby creating possibilities for entrepreneurship and new ven-tures.[12, 13]. The marketplace can allow for newly created objects to be shar-ed amongst users, as a loan or exchange for other devices. As the world is moving towards the internet-of-things, newer devices and applications will be produced. But by getting into DiY, people can avoid becoming markets for them thus making their lives more economical. As seen in the open source hardware trends, it is already becoming common for companies to seek inno-vations from users[14].

## Conclusion

Engaging in DiY activities is a fulfilling experience that gives satisfaction of having having done something, gives a sense of achievement of having created something that is usually machine made or would've been bought and on the whole, empowers people. In trying to get everyday people to attain the DiY attitude with regards to creating a smart space for themselves, some important questions pertaining to technology, ecology, society, economy and design are posed along with understanding what drives a person to engage in DiY activi-ties. The answers to these questions are being uncovered by means of evalu-ating prototypes with users, shoes-on research and casual conversations with existing DiYers. The challenges brought forth through the research has been tackled by envisioning future possibilities. These challenges lie in bringing the DiYness of sensor technology to the everyday people, not just in making them accessible but also making it interesting for them to tinker with.

# References


1 Thackara J., 2006, «In the bubble», MIT Press

2 Greenfield A., 2006, «Everyware: The dawning age of ubiquitous computing», New Riders Publishing

3 Tinker.it Homesense, http://www.homesenseproject.com

4 ITEA2 Do-it-Yourself-Smart Experience, http://www.dyse.org

5 Arduino, http://www.arduino.cc

6 Buechley L., Rosner D.K., Paulos E., Williams A., 2009, «DiY for CHI: methods, communities, and values of reuse and customization» in proceedings of CHI2009, Boston, USA

7 M. Weiser, 1992, MIT Media Lab Symposium on User Interface Agents, «Does ubiquitous computing need interface agents?»

8 N. Franke, M. Schreier and U. Kaiser, 2009, «The <I Designed It Myself> Effect in Mass Customization», in Management Science, 56 (1), 125-140

9 Bruce Sterling's lecture on Impact and Sustainability of Technology, at European Graduate School, Switzerland, 2006, http://youtu.be/AtE15Y4x3tQ

10 Siftables by Sifteo, http://sifteo.com/

11 Modkit, http://www.modk.it/

12 Shapeways, http://www.shapeways.com/

13 Ponoko, http://www.ponoko.com/

14 Wired Magazine, http://www.wired.com/techbiz/startups/magazine/16-11/ff_openmanufacturing?currentPage=4#ixzz0mWip1Ybe

15 Tinker London, http://www.tinkerlondon.com/

Chris Hand Edinburgh Napier University, c.hand@napier.ac.uk
Anab Jain Superflux Tessy Britton Thriving Too & University of Chichester Graham Burnett Permaculture Association & Spiralseed Publishing Darryl Chen Tomorrow's Thoughts Today Christopher Collett, Sanjiv Sharma Institute of Biomedical Engineering, Imperial College, London Charlie Tims Make Nubs Liam Young Tomorrow's Thoughts Today

# The Power of 8: Encouraging Collaborative DIY Futures

Keywords: Design fiction, co-creation, participatory design, future, interdisciplinary, speculative design

‹The Power of 8› was an experimental futures project, collaboratively driven by an ad hoc team of eight people from different walks of life. The aim was to explore new pathways for creating democratic futures by building a public discourse around the aspirations of ordinary people. The team of eight comprised a Designer/Speculator, an Educator, an Interaction Designer, a Permaculturist, a Policy Researcher, an Urbanist, a retired Civil Servant, and a Biomedical Scientist.

Through a series of three intensive workshops, and later a wider public engagement phase, we adopted a narrative approach to building a collective view, representing possible futures of Brentford in London, England. This paper describes the strategies we used – including maps, montage and storytelling – to develop concepts, visualise proposals and materialise ‹future artefacts› during the project.

## Introduction

‹The Power of 8› was an experimental, collaborative futures project conducted over a period of six months in 2009, in and around London, England. Its aim was to explore new pathways for creating democratic futures by building a public discourse around the aspirations of ordinary people. Through an open call for participation an ad hoc, multi-disciplinary team was brought together specifically for the project. There was also a public engagement phase in the middle of the project, and a final exhibition.

This paper is structured as follows. After briefly discussing some aspects of design fiction and storytelling we present a rationale for the project, followed by a detailed description of the processes followed and the strategies of materialisation which we employed. We then briefly describe the speculative outcomes and ‹future artefacts› resulting from the project, followed by a discussion of our processes and techniques.

## Using Design Fiction

*Increasingly, our concepts of past, present and future are being forced to revise themselves. Just as the past, in social and psychological terms, became a casualty of Hiroshima and the nuclear age, so in its turn the future is ceasing to exist, devoured by the all-voracious present… (Ballard, 1995; p4)*

Ballard's prognosis from 1995 is echoed in Stephen Kovats' recent comment that the success of the Apollo 11 mission marked «the beginning of the end of the Future» (Kovats, 2010). A growing view is that ‹The Future› in the popular imaginary is no longer what it used to be. Once the technological determinism of the late 20th century had delivered on its greatest promise – putting a man on the Moon – it was perhaps inevitable that we would begin a transition towards a different relationship with futurity.

Creating design proposals and scenarios, particularly when working on speculative, ‹futures› projects, clearly has much in common with the creation of fiction. Storytelling and creating ‹artefacts from the future› are increasingly found in the designer's toolbox; meanwhile Science Fiction «does not merely anticipate but actively shapes technological futures through its effect on the collective imagination» (Dourish & Bell, forthcoming). These parallel readings of Design and Fiction have led to proposals for Design Fiction (Bleecker

2009; Sterling, 2009) as a new form of hybrid practice, or even that beyond Design and Futurism lies «something we might call speculative culture» (Bruce Sterling, quoted in Anon, 2009).
But as with any hybridization of practice, we must be selective and critical of the techniques we import, mindful of the dangers of superficially adopting methods from other fields without understanding their grounding in their originating disciplines. Before moving on to discuss the techniques and processes used the project, we briefly examine some issues which arise when bringing together fiction and design.
As a form of entertainment, Science Fiction's audiences expect an emotional pay-off at the end of a story. In talking to Syd Mead – industrial designer and futurist involved in the visual design of Blade Runner, Tron and Aliens – Alex Steffen of Worldchanging relates how he asked:

*«what would it take to make a movie of Bladerunner's imaginative power, set in a positive future?» He paused for a second and said he thought it'd be very difficult, that catharsis is so important to people, and people are so terrified of the future, that you'd need some completely new vision of what the future will look like to even set the scene for a new narrative… and that is obviously no mean feat. (Steffen, 2008)*

But *catharsis*, the ‹cleansing› or resolution of the audience's emotions, isn't necessarily a given. Playwright Bertolt Brecht eschewed it as a technique pandering to the bourgeois, in the hope that leaving audiences with unresolved emotions would then lead them to social action – «Brecht wove together a montage that was aimed at conflict rather than resolution» (Highmore, 2002; p 23).
While there might sometimes be a strong distinction between utopia and dystopia in a literary setting, everyday lived experience tends to be far more ambiguous, ambivalent and open to interpretation. As a technique, montage, «whereby no single perspective or mode of presentation is ultimately privileged» (ibid.), is a useful tool in capturing and presenting visions of the future, made up from fragments of the past and present.
The Future is made from the past. Even technological and scientific extrapolations are based on extending existing trends into the future. Similarly, although Science Fiction narratives may initially appear to be focused on the future, «more often than not they are actually concerned with issues contemporaneous to their production» (Clear, 2009; p 9) and so they offer their contemporary audiences an opportunity to reflect on both their current situations and their hopes for the future.
A fictional world produced by an author according to a singular, imagined vision and narrative will be coherent and consistent, driven by their individual approach to the material and to the creative process. In contrast, building a collaborative vision with input from a range of people involves dealing with conflicting aims and viewpoints, both in the process and in the outcomes. In dealing with this we had to consider: How do we design collaborative futures? How can we use ‹conflict› for creative ends? How do we move towards a unified vision?
Recently designers such as Dunne & Raby, Lebbeus Woods and Auger-Loizeau have embraced these ideas to create props and artefacts, scenarios and experiences that were closer to home – projects that wanted to step out of the science fiction genre to create a discipline of their own, and to encourage debate on the different possible futures that may happen. Design Fiction aims to impact our current-day concepts by enabling designers to think of directions in which our collective future is shaped, while also acting as an accessible tool through which we can engage members of society in a dialogue about their individual hopes and fears.

## Rationale

This project arose from previous experience of working on speculative projects around emerging technologies, with one aim being to focus on how we imagine and materialise our collective future. Whereas the media projects and propagates apocalyptic futures relating to climate change, financial collapse, war and so on, individuals have their own aspirations and hopes for the future which contrast starkly with this, both in terms of optimism and scale. What happens when these views collide, and how do we resolve the contradiction between top-down dystopian views coming from our culture, and the actual desires of individuals?
From this question came ‹The Power of 8›, an experimental project by an *ad hoc* team of eight people from different walks of life, aiming to imagine a collective, democratic future by building a public discourse around the aspirations of ordinary people.
Apart from the core group of eight people, another important aspect was a public engagement phase which sought contribution of themes, issues and ideas from a community in West London, via an open weekend, an on-going exhibition, and a project blog. Although a range of speculative design proposals were produced by the core team, the primary purpose of this was to materialise the issues highlighted by all participants, and to present possible futures and emerging technologies in a way that facilitates open debate about their desirability and how we might relate to them.
The project was originally envisaged as an experiment in multi-disciplinary, participatory, speculative design and public engagement.

## Project Process

Figure 1→XVII
‹Power of 8› Process Map



Figure 1 shows a process map for the project, which unfolded in and around London from April to October 2009. It began with an open call for participation made by video,[1] email, a project blog, and targeted letters (Figure 2) sent to neighbours, acquaintances, local councillors and members of parliament. The call resulted in a team of eight people from different backgrounds, meeting in their spare time to work in intensive workshops, building a collective discussion about their hopes and fears for the future. The initial outcomes from this discussion were then opened up through an exhibition and open weekend, which invited contributions from the public in and around a gallery in Brentford, West London.

1 Superflux, «The Power of 8 - Call for Collaborators». Online video, 26 April 2009. http://vimeo.com/4337513

This public engagement phase led us to focus on specific issues resulting in a range of scenarios realized through prototypes, films and installations. As the project ended the final outcomes were exhibited for three weeks in the same gallery, alongside process documentation.
The team of eight comprised a Designer/Speculator, an Educator, an Interaction Designer, a Permaculturist, a Policy Researcher, an Urbanist, a retired Civil Servant, and a Biomedical Scientist. Of course, reducing each person to a single title hides their multi-disciplinarity and the many other skills and experience they were bringing to the table, including social innovation, philosophy, futurology, and a lot of teaching and writing, along with other specialisms which exist in the fuzzy overlaps. Finally, as volunteers coming to the project, everyone clearly had an interest in how we see and talk about the future, and in engaging with this through Design.



*Figure 2*→**XVII**
*Letter Writing Campaign*

With such a broad range of backgrounds and viewpoints in the team, it was always going to be a challenge to bring these together in a coherent way. Through three intensive one-day workshops we experimented with ways to give each of our individual aspirations a space to grow, while coming to terms with the conflicts and contradictions that spin out of such an effort (Figure 3). Almost like a design studio, we made our process visual from the start of workshop 1, beginning with a blank canvas and one question: «How would we like our neighbourhood to be in the future?» As a starting point we collaged images, keywords, drawings and presented our ideas through the spoken word.
Although the images may appear to depict a typical group design session, these kinds of design-led processes where new to many of the collaborators, which entailed building trust and answering questions at every stage as they were unsure of what they were getting into. Thus despite an initial aim to be ‹democratic›, at times the designer played the role of facilitator in order to guide to workshop along the lines of a typical design process. Even so, things didn't always proceed in this way and what resulted was often a hybrid, improvised process.
Whereas participants in a design workshop would usually know why they were there, or what they wanted, we found there where many unknowns, and the building of trust turned out to be a crucial aspect in our process. As participants got to know each other better, there was also increased understanding of the (potentially conflicting) ideologies and values associated with their own practice.



*Figure 3*→**XVII**
*Scenes from Workshops*

The aim of the second Workshop was to select key themes, and begin to think of ways in which we could make our ideas tangible. From ‹bikes that never crash›, to ‹invisible buildings› the team came up with a range of fun and thought-provoking ideas. We mapped these ideas under our key themes and gave them a spatial boundary, as if they existed in a town or a suburb. Each of us then drew our own pathway or trajectory through this ‹town› marking ideas along the trajectory that appealed to us.
But how were we to traverse this map and find the common threads that would connect us? As each of us scanned through this wall of ideas, frowns and disagreements surfaced: «That's not my future, I don't want a Taiwanese noodle shop on my street!» We struggled as we realized that ‹my street› of the future, had indeed become ‹our street of the future›. How do individual identities of the participants not get affected by such a collaboration? How do we move towards a unified group identity in achieving a vision, a world – or is this even possible? While keeping in mind that such a process would have to embrace conflict, we hoped that this project would eventually raise the right questions and had the intended impact on each of the collaborators and their respective audience.
As we way made our journeys through this map of the future, one of the team commented that the process had become «a kind of post-psychogeography where the dérive is reverse-engineered. Instead of drifting aimlessly through unknown cityscapes, we have plotted a route through a psychogeographic territory of our own making… with yet unexpected consequences.»
Building consensus from such a broad range of viewpoints and ideas would be very challenging, so instead we sought to find common ground through storytelling. Starting with present-day stories from each participant, we took this method forward into dealing with the future. After each participant had mapped out a trajectory they wanted to follow they went away and wrote stories about this journey.
Each participant brought sketches, trajectories and stories to the third workshop (Figure 4-Figure 7) and these continued to be refined and developed over a period of time, coinciding with an open weekend (see below) which saw ideas crystallised and reflected in the concerns of the wider public.
Ultimately all of the trajectories were combined into a large, complex schematic map – the ‹tube map of convergence› – which identified points of connection (Figure 8). Two examples of trajectories and stories are presented below.

## Example One: Path

*Figure 4*→**XVII**
*Example One - Path*



*Figure 5*→**XVII**
*Example One - Sketch*



## Example One: Story

*«Private fossil fuel powered transport all but phased out – streets now free for bicycles and food growing. Edible forest gardens and urban orchards, raised beds and pots of herbs everywhere.*
*Work and play – edges blurred; sharing the harvest, caring for children and each other, re-skilling and doing what needs to be done. Learning, cooking, playing, working and deciding together through consensus. «Chop wood, carry water» – the Zen path to enlightenment!*
*Street kiosks and cafes, bars and salons in the street orchard clearings, humble designs self built from local materials – wood, straw bale, adobe; cob benches for the cooler evenings. Trade as an excuse for conviviality and community rather than making money. Market places that nurture the soul rather than chill the heart.*
*Sitting in the wood panelled bar – fine local ales and cider or the best quality*

*Cuban rums and Normandy Calvados?? Decisions, decisions! But who cares as the old Cuban guys tell their stories, jokes and songs, memories in their aching joints and bones, pioneers from when the oil first ran dry now showing us how to thrive, so many seasons now since we reconnected with the earth. One day maybe I'll visit Cuba, travelling in the great solar powered airships isn't so fast, but they tell me the bars in the flying hotels are pretty cool nowadays. Slow lives well lived, slow travel well savoured.*
*Hard to believe we once let remote, corrupt politicians run our lives. Hard to believe there was once a thing called Capitalism…»*

### Example Two: Path



*Figure 6*→**XVIII**
*Example Two - Path*



*Figure 7*→**XVIII**
*Example Two - Sketch*

### Example Two: Story

*«The city is remade as a strange dense and enchanted jungle. Swarms of hybridised biotech creatures fly about the city as mechanical fireflies, and scurry around our feet, filling the air with a new chorus of animal sounds.*
*Swarms come together as clouds to make enclosures or create shade and then break apart again when they are not needed. We can turn the elements of this landscape on and off. Traditional buildings in the city dissolve as this new nature allows for all the functions they carried out to be located in the landscape or as prosthetics within the body.*
*We navigate this dense, technologically augmented nature with GPS and wireless as streets as we know them become redundant. This ‹other› nature however is open to be hacked and misused so trouble makers and vandals create rogue weather systems, disturbing new trees and animals and punkish body modifications.»*



*Figure 8*→**XVIII**
*The ‹Tube Map of Convergence›*

### Opening up: The Public Engagement Phase

Rather than following a typical design-build project model that might dictate urban morphology from the top down, we were hoping to inspire, and be inspired by, a wider community of local residents. So shortly after the third workshop, as part of an Open Weekend series, we exhibited our workshop ideas and invited the residents of Brentford to imagine their new neighbourhood on a large abstracted tabletop map of their local area, using Lego and foam board as raw materials. Physical montage was chosen as a technique for its democratic, accessible and playful properties. Using materials familiar to most people from their childhood, such as Lego or Plasticine (Milton & Hughes, 2005), encourages participation which is deliberately and obviously playful – crucial in reassuring participants that what they create doesn't have to be high-quality or accomplished.
Over the course of two days a steady stream of participants ranging from the radically activist to the playfully naïve populated this map with solar powered airships, snow stimulators, walking houses, public free boxes, trees that could talk to one another, new species of underwater organisms and human spinning tops. Through a process of physical montage the table was transformed into a landscape of fantasy and possibility in what is a mundane residential suburb of London (Figure 9). This brief public engagement phase helped move the project from the ideas of eight participants to a more open process, with local people imagining alternatives to the existing urban fabric themselves.



*Figure 9*→**XVIII**
*Results from Open Weekend*

The map, the public engagement workshops and our own narratives highlighted concerns around climate change, local production of food, the dwindling populations of honey bees, and their impact on agriculture and the economy, alongside a deep-seated nostalgia for a ‹green› world. Buried amidst this, the team sensed a hope that «fantastic technological innovations might still triumph and save us from doom».

## Scenarios and Outcomes

Scenarios and proposals crystallized around the fictional town of ‹Acres Green›, where people balance a pragmatic requirement to live closer to nature with their natural human impulses to subvert and control it. We set about creating four near-future scenarios, linked by the idea of an alternate, augmented ecosystem, which illustrate this ambiguity between the natural and the technological.
The scenarios are illustrated only very briefly here, but in practice each of these was realized through a broad range of video, artefacts, images, animations, installations and stories, presented in the final exhibition and through the project web site.[2]

### Prosthetic Trees and Feral Economies



*Figure 10*→**XVIII**
*Tree Prosthesis and Feral Cider*

Super-local food production takes on a new importance and bio-engineered prostheses allow single trees to produce multiple fruit crops in city streets. New micro-economies emerge, typified by enterprises such as a pan-city feral cider business.

### New Synthetic Pollinators: The Beamer Bees

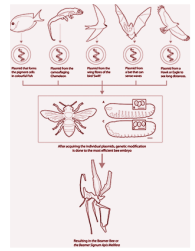


*Figure 11*→**XIX**
*Bioengineering of the Beamer Bees*

The Beamer Bee, or Beamer Signum Apis Melifera, is a new synthetic breed engineered by a community of biologists and hired bio-hackers to service under-pollinated trees, plants and vegetables due to the disappearance of honeybees. Whereas many species are thought to be disoriented by electromagnetic smog, Beamer Bees thrive in this environment and can even be called to areas where they are needed for pollination using a radio device known as a Bugle.

2 *The Power of 8. Project website www.powerof8.org.uk*



*Figure 12*→**XIX**
*Young girl keeps a glowing bee as a bedside pet*

Since Beamer Bees can glow like fireflies, their evening dances around radio antennae have become a popular spectacle in Acres Green. In many ways they are symbolic of this community, and people have become fond and proud of them.



*Figure 13*→**XIX**
*Bees in Acres Green*

### Manufactured Microclimates: The Living Hills

These artificial hills are built from blocks of a wax-like material which enables an efficient means of storing heat by capturing temperature change as it starts to melt. The blocks are easy enough for local people to assemble or disassemble, and so these structures evolve over time and even move around the landscape according to local needs. As community residents built them taller every year, they become a locus for creative exchanges, produce markets, bird-watchers and clandestine meetings.



*Figure 14*→**XX**
*Aerial view of living hills and flocking clouds in Acres Green*

### Manufactured Microclimates: Flocking Clouds

Controlled by embedded robotics, the flocking clouds move freely around Acres Green, their large surface condensing water particles, as with fog catchers. When they come together in tessellations this water is released to form rain.
While many find the clouds attractive or reassuring, local youths have been known to hack them and empty the rain-filled clouds onto passers-by.

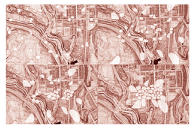


*Figure 15*→**XX**
*Flocking Clouds Tessellate, Bringing Rain to Where it is Needed*



*Figure 16*→**XX**
*A Single Glowing Cloud provides company on a late night walk home*

## Discussion

### Democracy and Conflict

While the notion of ‹democratic futures› as a process is a valid aim, in practice a truly democratic process is difficult to implement in this kind of setting, and we acknowledged the need for specific members of the team to facilitate the process at certain times.
Any collaborative design process will produce conflicts in a team and experienced designers recognise this as part of the process, but working with a multidisciplinary team which includes participants with less experience of this kind of process involves guiding and perhaps educating these participants. Working with the potentially conflicting ethical and moral positions taken by different collaborators was also an important part of the process; with hindsight reconciling the ideologies of, say, permaculture, biotechnology and urbanism is clearly going to require some significant bridge-building, and we considered this to be a crucial, central aspect of the project.

### Transformation

The project was a transformative experience for most, if not all, of the team. For some it was their first experience of a design project and exhibition. For those with design experience it was a less common experience to take on a more curatorial or facilitating role. All had to embrace the organic and the messy, and to rise through conflict and tensions. Building trust and fostering relationships was key to a short, intensive project involving people who hadn't worked together before.
All collaborators came away with a new perspective. As one of the team said, «I couldn't really say I wanted fake bees and fake weather. But this helped me feel optimistic that we could actually take action to protect [them]». Most have also continued to build very actively on ideas and experiences which came directly from the project, resulting in new books, social innovation ventures, research projects and so on. Further partnerships and collaborations have also resulted.

### DIY Futures

Although we produced speculative proposals for possible futures, we were using technologies and processes available now to create believable prototypes that are able to engage the public in a direct and stimulating way, aiming to create fictional artefacts which can help suspend disbelief, but could also help to discover real opportunities.
On another level, we were also engaging with emerging and future technologies, on a ‹DIY› level – in the sense that none of us (excepting our biotechnologist) has any real expertise in these areas.
On both these levels we find inspiration in Adam Greenfield and Nurri Kim's stated ambition for their venture Do Projects[3]:

*«[to] figure out what ‹do-it-yourself› might mean in an age when new production technologies, informational and logistical networks give the independent amateur producer unprecedented power to reach out and make things happen.»*

### Conclusions

The Power of 8 was an experiment that brought together the creative potential of curious people having various expertise, with that of the wider community, those who share in the lived experience of the city and its infrastructure, to produce a collective expression of the future. The project was always conceived of as open, a starting point, and these ideas are now being taken forward, with team members finding new collaborators and spinning out new projects and processes.
While it was initially our aim to tell an optimistic story about the future, we wanted this story to bring forth the inherent dilemmas and complexities of any such Endeavour. Bringing an *ad hoc* team together to build a collective vision, to give form to some of our dreams for the future, would invariably result in

3 *About Do Projects. http://doprojects.org/about*

conflicts and tensions, but it was also a valuable earning experience to work with different people and understand and explore different world-views. Embracing organic, messy processes is necessary and deliberately opposed to the seemingly simple, top-down, deterministic, policy-driven future we are used to being fed.
Although not all the team were involved in the production of each component of the final exhibition, everyone's influence was present. Ultimately none of us feel entirely comfortable with Acres Green, but we can all see our part in it – a bit like the future.

## Acknowledgements

We gratefully acknowledge the support of Arts Council England, Waterman's Gallery Brentford and London Design Festival. Many thanks also to Ilze Black, Jon Ardern, Steven Ounanian, Alice Frost, Russell Davies, the DMC Lab at The Bartlett, University College London, Oliviu Lugojan-Ghenciu, Ruchi Khurana, Ian Hawes, Pete Clark, Francois de Merode, Rayna Cooke Ferner, Marianne Cadbury, Emma Harris, Brad Flahive, Emma Smales, and everyone who contributed to the open weekend and the exhibition.

## References

*Anon. (2009) Dunne & Raby | Bruce Sterling. Icon 078, Dec 2009, pp 61-65.*

*Ballard, James Graham. (1995) introduction to Crash. 1995 re-issue, p 4.*

*Bleecker, Julian. (2009) Design Fiction: A Short Essay on Design, Science, Fact and Fiction. March 2009. http://www.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/ Accessed 20 April 2010.*

*Clear, Nic. (2009) «A Near Future». Architectural Design, 79(5): 6-11.*

*Dourish, Paul and Bell, Genevieve. (2009) «Resistance is Futile»: Reading Science Fiction Alongside Ubiquitous Computing. Journal of Personal and Ubiquitous Computing, forthcoming. - Cited in Bleecker 2009.*

*Highmore, B. (2002) Questioning Everyday Life. In Highmore, B (ed). The Everyday Life Reader. Routledge.*

*Kovats, Stephen. (2010) introduction to Destination Moon panel at Transmediale 2010. Berlin, Germany, 2-7 February 2010. http://www.transmediale.de/en/stephen-kovats-introduces-session-destination-moon Accessed 22 April 2010.*

*Milton, Alex and Hughes, Ben. (2005) Claystation - Design Modelling and Creativity. in Crossing Design Boundaries, P. Rodgers, L. Broadhurst & D. Hepburn (eds), Taylor and Francis.*

*Steffen, Alex. (2008) Strange and Happy: Science Fiction and the Bright Green Future. Worldchanging, Blog post 17 Feb 2008. http://www.worldchanging.com/archives/007843.html Accessed 24 Feb 2010.*

*Sterling, Bruce. (2009) Design Fiction. Interactions 16(3): 20-24.*



## Mobile Access to Knowledge: Afrofantasy

Davide Fornari SUPSI University of Applied Sciences and Arts of Southern Switzerland, davide.fornari@supsi.ch
Iolanda Pensa Lettera27 Foundation, Italy, iolanda.pensa@lettera27.org

*How writing can express utopian desires and imagine changes to material culture? Literary experiments produce a pattern of vision that opens up new worlds, other worlds, visionary presents and impossible futures. Science fiction, speculative fiction and fantasy contain all these possibilities.*
*Stacy Hardy*

The African continent has been producing cultural contents, but due to technological limitations, they are mostly analogical and barely available on the web. Climatic conditions make difficult to preserve digital data: Mobile A2K aims at bringing these ressources to the digital world, in order to spread them through new displaying formats/tools. Yet under development, Mobile A2K is employing scenarios, participatory design, and practices typical to visual arts in order to focus on the interaction and interface design as a key to make contents available on the most used ICT device in Africa: mobile phones.
The issue of making contents produced within the African continent available through mobile phones concerns different disciplines and fields of knowledge, notably the design discipline for its potential of prefigurating future solutions.
Our purpose is to develop formats for an itinerant, modular and ever-changing exhibition for the Salon Urbain de Douala (Cameroon), an event relying on existing ressources to familiarize schools and cultural institutions with new interfaces that can help tracking and communicating urban transformations. An advanced workshop where radical models for unlikely futures are being assembled.



## The Ideal Form – a statistical approach to the prediction of good design

Michael Kangas Studio Beat Karrer GmbH, Switzerland, kangas@beatkarrer.com
Beat Karrer Studio Beat Karrer GmbH, Switzerland, karrer@beatkarrer.com

The Ideal Form is a cross-disciplinary research project in which a statistical modelling technique from the pharmaceutical industry will be used to optimise decision making in the field of industrial design. The researchers plan to evaluate 10 qualitative and 10 quantitative parameters from a cohort of 10 design classic chairs selected from the Vitra Design Museum archives. In addition, a cohort of 20 non-classic chairs will be used as a control population. The gathered data will be analysed using a Bayesian statistical model in order to identify a set of characteristics or parameters that have contributed to the success (or non-success) of these chairs as design classics. Bayesian modelling is a probability-based tool that guides human decision making. The information learnt from this research may lead to a greater understanding about why some chairs become design classics but others do not. The research may also generate tools that industrial designers can proactively use to optimise the choices they make when designing new chairs. The ultimate objective is to help increase the probability of their chair designs becoming classics in the future.

In the workshop, the research team will explain the rationale and methodology for the project and then engage in an open discussion with the participants.

## The Everyday Story of Imaginative Time & Space

Austin S. Lee NASA Jet Propulsion Laboratory, USA, coolistmin@gmail.com
Yuseung Kim Yahoo! Search, USA, yuseung@yahoo-inc.com

We have been exploring notions of time and space by restructuring the familiar world in unfamiliar ways through data interpretation, prototyping and creating visual narratives. We speculate that through positioning computation in creative contexts, individuals could become increasingly aware of the invisible insights of the modern digital life. This workshop will cover the contexts of ‹Future and Fiction› by introducing design research as a body of work based on idiosyncratic vision about time and space. The goal is to learn ways of looking at daily life experiences in digitally enabled environments through technology and Designerly Thinking. We will present design research projects developed in the context of fictional design and visual explorations at NASA's Jet Pro-

pulsion Lab related to the topic. Participants will have opportunities to create compelling visions of an embedded digital world through active discussions and hands-on design exercise based on a given research question.

## Standard MisDelivery AD 2025

Ko Nakatsu Blackboard Inc., USA, ko.nakatsu@gmail.com
Eric Lai Independent Contractor, USA, and dear.elai@gmail.com

The permanence of streets and buildings are used as markers to communicate addresses for delivery. In the future, other markers will be used, like time-based locations. Since your historical locations have all been logged, the Delivery Organization can now deliver to anyone in the past… unless they make a mistake.
In this workshop you'll go through the process of how to forecast objects of a probable future and it's impact on culture. We'll imagine the impact of these designs by analyzing them as catalysts for tomorrow's history.
We'll be going over the three key roles that a designer plays that can be leveraged against other professions. Activities will include presentations and hands-on trial of pop-culture breakdown, design planning for trends, translation of research, and finally participating in the Standard MisDelivery project. We'll probe with questions of design impact, explore divergent scenarios, and analyze the value shifts in society. The hope is that you'll walk away tweaking the way you think as well as gaining a very practical methodology to use in concept development!

## Curious Interface

Carina Ngai Adobe Systems, USA,cngai@adobe.com
Bao Vo Bao Vo Creative, USA, bao@baovocreative.com

The traditional process of designing User Interface involves creating a series of feature sets that negotiate the capabilities of technology and the needs of users. The end result is practical and functional. But what happens when we use design to create questions that inspire and provoke thinking? How about using design to raise and discuss controversial issues like healthcare, ethics, privacy, sustainability, etc?
As designers we have the ability to imagine and initiate discussions on the future we want. With new emerging products and services, there will be both positive and negative corresponding social and cultural impact. For example, we strive to live in a more connected world, but struggle with privacy and ethical issues.
In designing for the future, this workshop challenges designers to first dissociate design and practicality. Instead, designing an impractical and ‹curious› interface can be a powerful research method to speculate on our future, one that is complex and full of contradictions.
The Curious Interface Workshop encourages serious play and introduces design as a method to research and gain insights. Participants view a segment



from an iconic film and design a new product or service that will help the movie characters overcome their challenges. How will the design ultimately affect the movie narrative? How would this new product or service also change our daily lives today? What problems can be solved and what new problems are created?

## Bio-Conscious Design Fiction

Stijn Ossevoort Lucerne University of Applied Science and Arts, Switzerland,stijn.ossevoort@hslu.ch

According to Herbert Simon, design can be defined as a process of change (Simon 1982). We all know designers analyse existing situations and imagine new, often better, alternatives. Central to the process is the moment in which the designer initiates new ideas and solutions. For this to happen one needs inspiration. In this short workshop we will focus on design inspiration but take it one step further. We will not analyse existing users, neither create user scenarios; instead we will examine the interdependent relationships in nature and translate our findings to our future everyday lives. We will develop simple situations and concepts, inspired by nature.
The aim of the workshop is to introduce the ability to think from a natural point of view in order to initiate design ideas that are closer to nature. The challenge is to learn from nature without copying nature; instead of creating Bio-mimicry we will generate Bio-conscious Design Fiction.

## The Process of Image Generation as Model of Imagination

Michael Renner University of Applied Sciences Northwestern Switzerland, michael.renner@fhnw.ch
Nicolaj van der Meulen University of Applied Sciences Northwestern Switzerland, nicolaj.vandermeulen@fhnw.ch

Mankind is described as a cultural being, which specifies the powerful human ability to develop new achievements relevant for a society and its' prosperous further development over generations. Since the ability to advance in the described sense is typical for the human being, it is surprising that we find only sporadic reflections about methodologies of developing the new in the humanities and sciences.
From the point of view of design and art it is interesting that the terms imagination (imaginatio) and image (imago) are closely related. Following the hypothesis that creating the new is influenced strongly by our dominant visual perception and our ability to process and generate images, we can focus on descriptions of the creative act in art and design and analyze the design processes as models of imagination.
From this point of view the analysis of design processes can be compared with theoretical concepts of image generation, such as the analytical composition

of visual elements or the emotional gestural act of the genius which are closely related to the ideas of creatio ex nihilo versus figuration. The workshop presents some of the sources in the history of images, philosophy and cognitive sciences, which address concepts of the generation of unseen images. These theoretical positions will be compared to image generation processes in art, design and practice led iconic research. The workshop will give an insight into the research approach developed at eikones NCCR Iconic Criticism (www.eikones.ch) in the Module Image and Design Process and the Master of Art in Visual Communication and Iconic Research (http://www.fhnw.ch/hgk/ivk/master-of-arts/iconic-research).

## Design Learning Futures – principles and practices of design studio education in the 21st Century.

*Nicole Schadewitz The Open University, UK, n.schadewitz@open.ac.uk*
*Steve Garner The Open University, UK, s.w.Garner@open.ac.uk*
*Jennefer Hart The Open University, UK, jennefer.hart@open.ac.uk*

This workshop seeks to explore and negotiate the future of design studio education. Undoubtedly, design studio education has been a leading pedagogical principle in design learning for over 100 years. But we have not managed to establish a solid theoretical foundation of good principles and practices within design studio education. Nowadays, the learning environments are changing fast. Virtual learning environments become part of traditional university education. What are the foundations and best practices of design studio education and how can we carry them further into the 21st Century and into virtual learning environments? This extends beyond merely an online design studio. This workshop explores the integration of social networking, peer group interaction, teaching and learning, creativity, communication and the enrolment of students into professional communities of design practice. In the format of small group work and discussions, the participants explore underlying theory of design studio education and identify best practice in design teaching and learning. The aim is to engage in an open discussion on the nature and future of design atelier education. It would be beneficial for the design discipline as a whole to develop a catalogue of best practice and principles that could be used to build a theory of design learning and education. Using the online social network ‹Cloudworks› (http://cloudworks.ac.uk/) developed by the Open University, the participants start capturing these good practices within the workshop to further develop and share them with the wider design community.

## UPGRADE – Perspectives on Corporal Design

*Christoph Zellweger Sheffield Hallam University, UK/ HSLU Switzerland, edu@christophzellweger.com*

In our collective search for self-realisation and improvement, societies around the globe discuss the pro’s and con’s of altering, of re-designing body parts through genetic or medical interventions and they further engage in experimenting with new technologies and procedures supported by an expanding industry. In 2010 it is possible to state, that for parts of society the human body has become a luxury item and a commodity to be optimised and aestheticised with the help of surgeons, psychologists and personal advisors. Are these professional communities engaging in Art or Design practices? What qualifies a Corporal Designer?
Participants will discuss and map a possible ‹corporal design› practice and research that assesses such relevant cultural, social and political metamorphosis happening skin deep.
The workshop aims to raise a debate on new directions of social rituals, alternative socio-political scenarios and technological departures, while encouraging the development of self-reflective practice.
The workshop considers the role of the designer as author, the body as a site layered with meaning and emotion and design as a critical, transformative and speculative tool. Within this setting participants will explore issues of identity, body images and different narratives around the body, responding to factual, fictional and ethical dimensions of such phenomena.

## Generative and Analog Ornament

Antonino Benincasa Free University of Bozen-Bolzano, Italy, antonino.benincasa@unibz.it
Jörg Gleiter Free University of Bozen-Bolzano, Italy, joerg.gleiter@unibz.it
Matteo Moretti Free University of Bozen-Bolzano, Italy, matteomaria.moretti@unibz.it

The workshop is conceived of as an introduction into generative design. In simple exercises we will explore the potential of generative design by comparing digital and analog design methods. The workshop will open with a short introduction to the theory of generative design and its analog counterpart: ornament. It will be argued that generative design has its historical forerunner in classical ornament. Both share one central feature: They are process-oriented and have an immanent historicity. That means that in both cases innovative form is less a matter of invention than a byproduct of the rules set up beforehand. Like ornament generative design questions the role of the author and its aesthetic judgement (taste). In parallel sessions and applying the same rules we will explore the potential of traditional, hand made ornamental as well as digital generative design processes. Finally we will compare the outcome to each other and try to evaluate their potential for contemporary design.

## Gender specific end-user experiences inspirational for visual communication?

Olivia Blum University of Applied Sciences and Arts of Southern Switzerland, olivia.blum@supsi.ch
Cecilia Liveriero Lavelli University of Applied Sciences and Arts of Southern Switzerland, cecilia.liverierolavelli@supsi.ch
Fred Voorhorst University of Applied Sciences and Arts of Southern Switzerland, fred.voorhorst@supsi.ch

‹Gender specific end-user experience› as inspiration for design may help to see the world as it could be, design artifacts and bring new realities into being. This workshop looks at the initial stages of the design process, and explores the impact of a strong focus on ‹captured end-user experiences›. User experience is recognized as important for user retention, but more likely to be the result of the design process rather than a concrete input. The problem with ‹user experience› may be that it is difficult to capture. A few approaches (such as enactment) are emerging that capture experiences such as emotion, the situation of product use, and social and cultural influences. Even when user-experiences are captured, they may not be freely interchangeable, for example between genders.

During this workshop you will participate in a design exercise based on a brief containing an enactment by a mime artist to capture and communicate the end-user experience, as well as gender specific input. Based on this you will be are asked to design a visual communication. At the end of the workshop we will review of the designs created, and evaluate the (relative) impact on the design by both enactment capturing the ‹user experience› and gender specific input.

## Phenomenology of Atmospheres

Alain Findeli University of Montreal, Canada/University of Nîmes, France/Grenoble School of Architecture, France, alain.findeli@unimes.fr
Noëlle von Wyl CELEA, Switzerland/University of Applied Sciences Northwestern Switzerland, n.vonwyl@celea.ch

The concept of atmosphere has recently gained considerable attention within the architectural, landscape, and design disciplines, whether in professional practice, in research, or in education. By ‹atmosphere› one tries to designate the overall quality of a built or natural environment or space as experienced by its users or the public, more generally. If the human sensitivity to atmospheres is an indisputable fact, it is much more difficult to define, describe, compare, appreciate, and indeed to ‹measure›. Such tasks are very complex and in order to do so, various dimensions must be considered: biology, physiology, health and well-being, aesthetics, sustainability, spirituality, etc.
In this workshop, a practical phenomenological approach to atmospheres will be proposed to participants. We will particularly focus on the contribution of light to the quality of experienced atmospheres. The aim of the workshop is mainly pedagogical in that it will stress the methodological difficulties raised by the characterization of atmospheres. Depending on the time and the num-

ber of participants, the settings will be ‹natural› and/or ‹artificial›. By natural is meant a choice of architectural environments in the city of Basle, whereas artificial refers to an experimental room specially equipped with different lighting systems that can be controlled to produce a wide variety of atmospheric qualities.

## Creative Processes in Collaborative Design of Software Applications

*Claudia Iacob University of Milan, Department of Computer Science and Communication, Italy, iacob@dico.unimi.it*
*Li Zhu University of Milan, Department of Computer Science and Communication, Italy, zhu@dico.unimi.it*

Creative design processes involve a wide range of human endeavor. Problem finding and problem solving – understanding and defining problems, balancing forces and coming up with creative solutions – are the key steps in any design process. The complexity of design problems and the expanding scale of design projects require more knowledge than any individual can possess, and therefore need multidisciplinary stakeholders' collaboration. Thus, collaboration also implies a continuous negotiation process, since stakeholders come from different disciplines and cultures. Software design is an appropriate example since it requires a large diversity of expertise and knowledge. Graphic designers, software engineers, programmers, human-computer interaction specialists, marketing people, and end-user participants come together and collaborate in the design of software applications.
The aim of this workshop is to provide a context for exchanging ideas and gaining insight on the application and usage of creative techniques in collaborative design processes of software applications. The workshop will introduce participants to the use of design patterns in supporting collaborative design and enhancing creativity. Following the four phases of a creative process as defined by Graham Wallas (namely, preparation, incubation, illumination and verification), we aim to identify the design and behavioral patterns followed by designers. Moreover, we will explore the ways in which designers negotiate around design artifacts – such as sketches, mockups, design patterns – during the collaborative design of software applications. The identified patterns can provide some principles and features necessary for future collaborative design and negotiation.

## Undesigned for: re-thinking interactions through game-play design

*Vanessa De Luca University of Applied Sciences and Arts of Southern Switzerland, vanessa.deluca@supsi.ch*
*Serena Cangiano University of Applied Sciences and Arts of Southern Switzerland, serena.cangiano@supsi.ch*
*Irina Suteu Politecnico di Milano, Italy, irina.suteu@mail.polimi.it*

This workshop provides a game session for training participants in using alternatively methods for ideas generations in the design area of activities and functions permitted by physical interfaces. Instead of fixed procedure of design thinking we propose models useful to criticize existing artefacts and to structure the intuitions in a collaborative context. In this way Game-Play Design approach will support the design practice in a variety of ways, e.g. by facilitating lateral thinking training methods, offering tools appropriate to work by context techniques, investigating potential interfaces development, or by providing opportunities for collaborative design exploration and new concepts generation.
Persons interested in participating should assume the role of gamers in predicting collaboratively novel uses of well-known objects placed in their unrelated scenarios. A potential outcome is to acquire a groundwork building method for managing and analyzing real-world scenarios of interaction with objects and environments. A further goal is to experiment unusual game design situations fruitful to stimulate the concepts generation using game materials furnished to support the overcoming of conditioning processes.
The training in self-conscious design by game-play method could bring benefits to several design fields, such as service, urban, interaction and product design. In this perspective the workshop aims to suggest a subversive operation by anticipating the user needs without restrictions. The collaborative brainstorming method is intended to open design dialogues by removing the limits and conventions of the creative thinking.

## NONOBJECT Design

*Branko Lukic NONOBJECT, USA, branko@nonobject.com*

This workshop explores the philosophy of NONOBJECT design. The ‹objective› world is one of facts, data, and actuality. The world of the ‹NONOBJECT› is about perception, experience, and possibility. NONOBJECT design shifts the paradigm of traditional product design to create the next dimension of design: a thoughtful examination of the space between the user and the object and a conscious reinterpretation of how users relate to the objects.
Product design has existed over thousands of years as a tradition funda- mentally rooted in identifying and fulfilling basic human need. However, as humanity, society, and technology has evolved, so have expectations; products no longer need to be simply functional and comfortable, but also stylish and current. As time progresses, more and more designers have learned to create products that merge functionality flawlessly with style. However, the question

today is what happens next? What happens after every product is both functional and aesthetically appealing?
This is where the NONOBJECT philosophy is born. NONOBJECT seeks to create deeper, richer and more engaging relationships between products and their users. This workshop will explore the dimension where product design meets philosophy, poetry, and the theater of the imagination and introduce the fundamentals of NONOBJECT design.

## Using Failures in Design Fictions

*Nicolas Nova HEAD-Genève, Switzerland/Lift lab, Switzerland/near future laboratory, USA, nicolas@liftlab.com*
*Julian Bleecker Nokia Design/near future laboratory, USA, julian@nearfuturelaboratory.com*

The notion of ‹Design Fiction› is an original approach to design research that speculates about the near future not only with storytelling but also through active making and prototyping. As such, design fictions are meant to shift the interest from technology-centered products to rich and people-focused design. There are of course various ways to create design fictions. One of them we would like to explore in this workshop consists in relying on failures. We hypothesize that failures and accidents can be a starting point for creating rich and meaningful speculative projects. Think for instance about creating props or prototypes and exhibiting failures within it to make them more compelling. Or showing something as it will work with the failures – so anticipating them somehow rather than ignoring the possibility. What will not work right? What problems will be caused? What does it mean?
Based on short and participative activities, the workshop will address the following issues:
— Can we include the exploration of failures in the design process? How to turn failures and people's reaction to failures into prototyping tools?
— How can design fiction become part of a process for exploring speculative near futures in the interests of design innovation? What is the role of failures in creating these design fictions?

## Historical Graft – a workshop redesigning the past

*Johnathan Puff independent researcher, USA, jspuff@umich.edu*

Fiction is useful: Beyond a literary exercise or aesthetic play, fiction does work in the world: it ties together loose ends into something coherent, or it allows the deviant to flourish under the guise of business-as-usual. In a sense, as designers, we are constantly either telling stories to ourselves or telling stories to other people, tying our work into dominant narratives. Either way, we are endlessly ‹making things up›, and then again, it is never quite clear if we are aware enough to recognize this ‹graft›.
‹Graft› is a helpful term for understanding the practice of design fiction. It suggests the introduction of something new to an existing system, while also indicating an underhanded sort of action dealing in self- conscious deception. This workshop will explore ‹graft› as a design technique. While limited in its focus, it is intended to provoke a larger disciplinary discussion about the ways fictionalizing can – or should – be framed with respect to the design and making of things.
Participants will begin with several ambiguous objects and a loose objective: producing a designed fiction by utilizing both photographic and literary devices as tools for manipulating how these objects are understood. The goal of this exercise is to develop a range of possible scenarios by which similar objects can emerge within a historical narrative.
This will be a hands-on photography workshop, culminating in a collection of images produced by the par- ticipants. Digital cameras are required.

## Versus – Diagrams and visualization to observe social Complexity

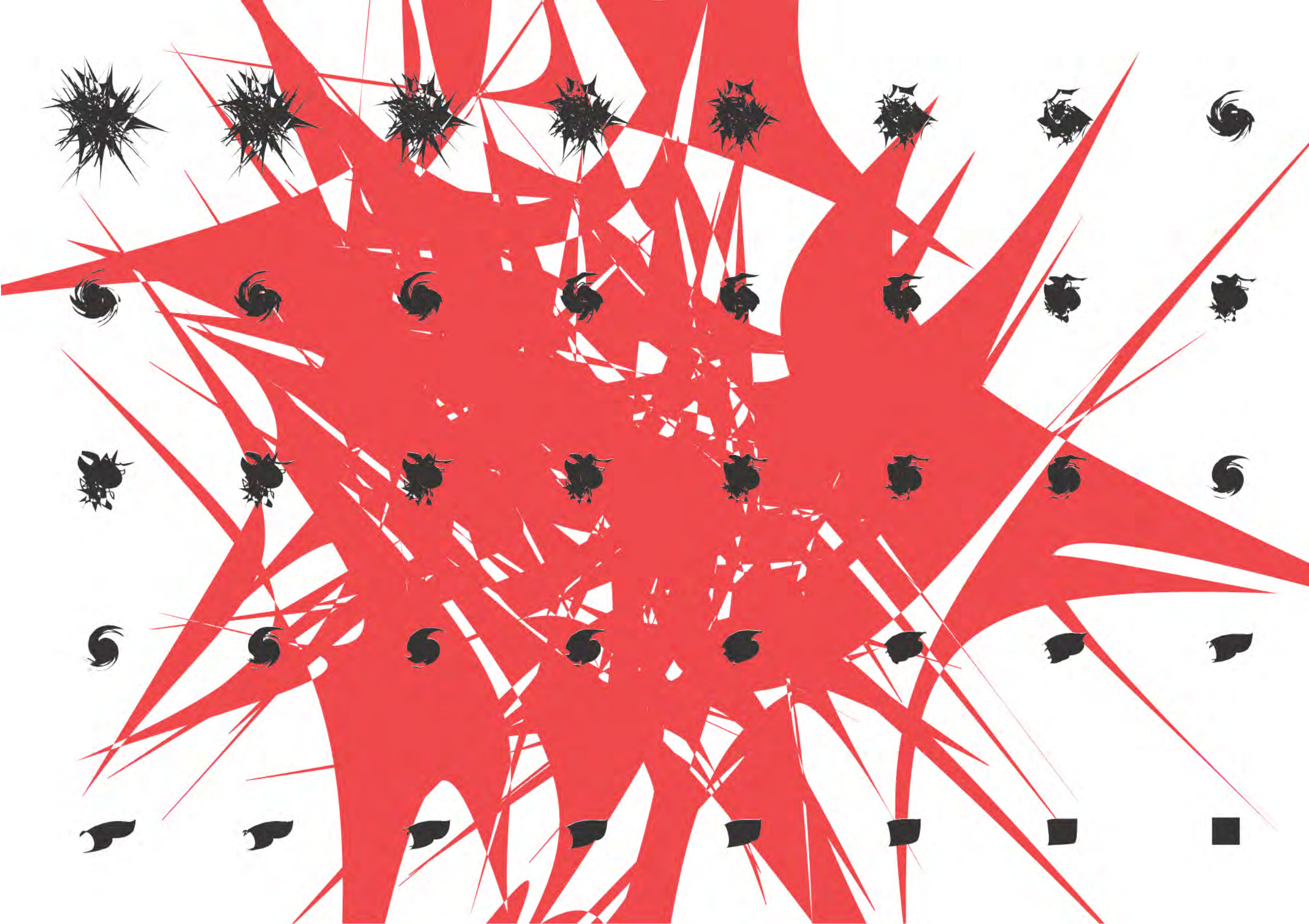
*Donato Ricci DensityDesign Lab/Politecnico di Milano, Italy, donato.ricci@mail.polimi.it*
*Giorgio Caviglia DensityDesign Lab/Politecnico di Milano, Italy, Giorgio.caviglia@mail.polimi.it*
*Gaia Scagnetti Massachusetts Institute of Technology, USA, gaia.sca@namedgaia.com*
*Daniele Guido Médialab/Science Po Paris, France, daniele.gui@gmail.com*

The cartography of controversies is a new way of exploring and understanding complex systems. Controversies, here seen as social Complex phenomena, are one of the most multifaceted phenomena of society. Using the Internet a precious box which contains the elements to capture, explain and discuss social phenomena, we will observe how Complex social issues and events are taken into consideration by design actors. We will explore how to render such Complexity, using the Internet as an epistemic machine, and visualization technique, as devices to give meaning to heterogeneous data. In this sense to visualize information, through diagrams, are considered devices to be used in drafting better questions about the observed controversy. It could be stated that The objective of the workshop is to give a primer both on the use of the Internet based research strategy and the use of visual devices like epistemic machine or finding engines, rather than searching engines offering the possibility to make profit both from quantitative and qualitative research methods.
We will try to understand how the disruptive eruption affected one of the bigger designed networks, the transportation system. We will understand how to use the Internet to grasp the various discourses that the design actors are producing, how big is their commitment to specific controversy and how they differ.

# How We May Work – Plexwerk as an experimental space for services and products of instant spectacular production.

*Mischa Schaub University of Applied Sciences Northwestern Switzerland, mischa.schaub@hyperwerk.ch*
*Benjamin Schmid Plexwerk/University of Applied Sciences Northwestern Switzerland, benjamin.schmid@hyperwerk.ch*
*Nicole Wuest Plexwerk/University of Applied Sciences Northwestern Switzerland, nicole.wuest@hyperwerk.ch*

Since 2001 the institute HyperWerk for Postindustrial Design HGK FHNW has been looking into alternative kinds of design, of customization, of public production and of sustainable consumption, mixing high-tech with high-touch for customized one offs. We think that both factories and supermarkets offer rather unsatisfying experiences and we propose fundamental change within these realities and rituals.
During the last two years we have been preparing the experimental space Plexwerk for our main design research interest ISP: Instant spectacular production. Plexwerk is a mix of a hackerspace, a decentralized design park and a techshop.
During the workshop you will go on a guided tour to visit HyperWerk and Plexwerk, to discuss the potential of our experimental and entrepreneurial plattform for design research and how you might participate in the network. Please be aware that everything is still very rough and at the beginning!
We will inform you about our first trial runs with instant production and why this might become an important pillar of consumer oriented design in the environment of Switzerland.
On a hands-on level you will get to know our range of models of 3D printers and our first experiments in the printing of ceramics. Playing with a prototype of our experimental ballon welding machine you might understand, why we consider the conception and construction of machines as a core dimension of process oriented postindustrial design.
At the end of this workshop we would be very happy to discuss with you all kinds of practical collaboration.



Images

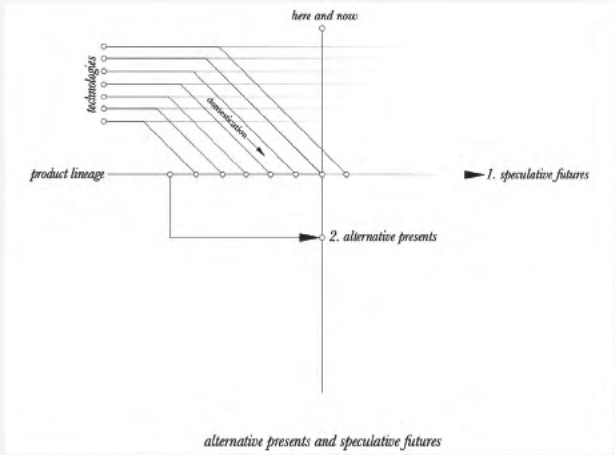



Figure 1→44
*Alternative presents and speculative futures.*



Figure 2→45
*Spielberg's alien*



Figure 3→47
*biotic to domestic*





Figure 4→47
*EDSAC, Cambridge 1949*



Figure 5→47
*Apple iMac 2007*



Figure 6→48
*Audio tooth implant (Auger-Loizeau, 2001)*










Figure 7→49
*Publicity for Audio Tooth Implant.*




Figure 8→50
*Asimo by Honda Corporation (2000 -)*

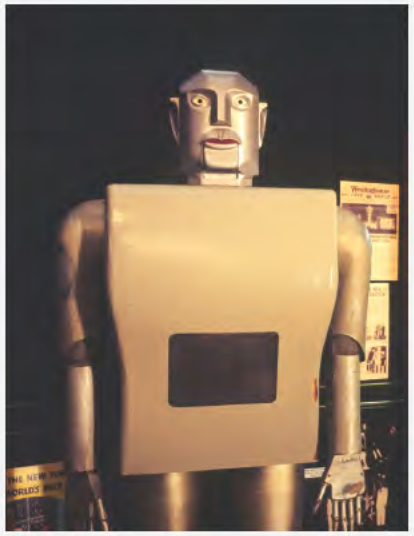


Figure 9→50
*Electro by Westinghouse. (1939)*

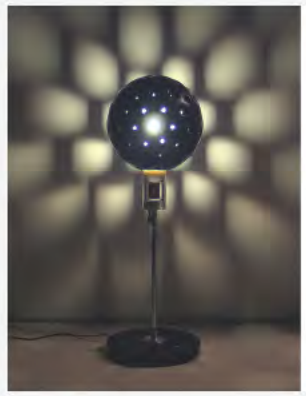




Figure 10→50
*Carnivorous Domestic Entertainment Robots (Auger-Loizeau, 2008)*

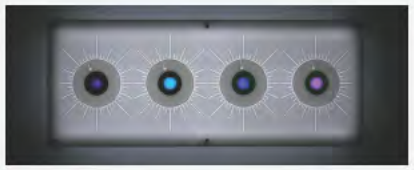


Figure 11→51
*Happylife display (Auger/ACSD, 2010)*





*Figure 12*→**51**
*thermal image camera*



It was that time of the year. All of the Happylife prediction dials had spun anti-clockwise, like barometers reacting to an incoming storm. We lost David 4 years ago and the system was anticipating our coming sadness. We found this strangely comforting.

*Figure 13*→**52**
*Happylife scenarios (1 of 5)*



*Figure 14*→**52**
*Iso-phone (2003)*

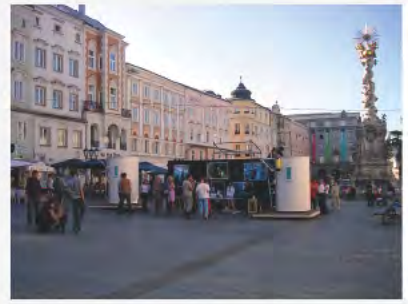




*Figure 15*→**53**
*Iso-phone at Ars Electronica*






*Figure 16*→**54**
*Afterlife coffin with MFC.*

*Figure 17*→**54**
*Afterlife battery concepts*



Why an aeroplane? Why a Spitfire MK1?
I don't feel the need to be remembered as an object. I'd like my energy to create an act. Since a child flying has fascinated me, not sure why, just does. I have always wanted to fly but have never completely felt at ease enough to think I could manage it without killing myself. I still intend to fly myself in one way or another but just in case I don't this will ensure it.
Very rarely man creates an object that connects with the human soul; anyone who has witnessed a Spitfire and especially the MK1 in flight will have felt that connection. It looks, sounds, functions and is just 'right', it is perfect. The curve of the wings, it's proportions, it's functionality, it was also fitted with the Rolls Royce Merlin which without exception, before, after or at anytime in the future is the greatest four stroke engine ever produced.

Tom O'Brien, 2009



We'd use our battery for a euthanasia machine.
As we are a couple, once one goes, we're not sure how long the other one would be able to hang on. So, if it's all too much, we could use the energy from the first one to go, to help the second one on their way. I'm not sure if it would be a form of conceptual murder or not, but definitely an 'assisted' suicide.
Ideally we'd like to propose an object based on an existing machine, it would foreground the battery, which would be inscribed and silver-plated. We would probably replace the usual questions the machine asks you to check your state-of-mind with something more personal.
We imagine you would set it up on a small table by your bed or a chair, insert the battery, put the mask on, then after a few minutes, insert the tube into the device which causes a green light to come on letting you know it is working and ready. Then, you can lie back on your bed, or armchair, close your eyes, and 30 seconds later the carbon dioxide will begin to flow ...

Tony Dunne and Fiona Raby, 2009



*Figure 1*→**93**
*Digital rendering of the proposed ‹Fantastic Form› on site in Neuchâtel.*



*Figure 2*→**95**
*Stop motion analysis of a walking man, Étienne-Jules Marey, from Le Mouvement 1894.*



*Figure 3*→**98**
*Scene from Aeon Flux (2005) example of the five ‹fantastic› architectural parameters.*

*Figure 4*→**100**
*Digital design explorations and physical prototypes for the pavilion*

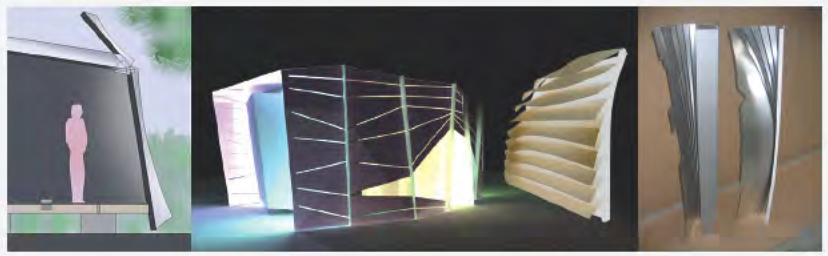


*Figure 5*→**101**
*Development of the wall composition, tests for colour, materiality, and design expression.*

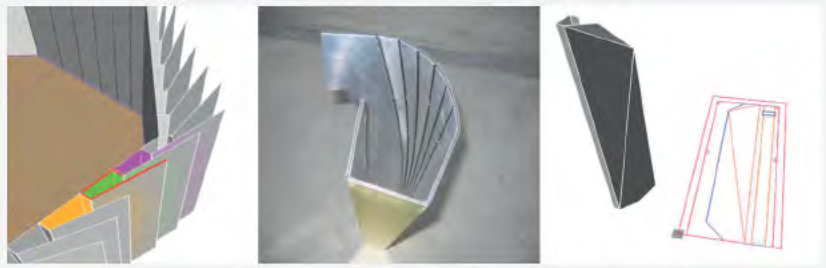




*Figure 6*→**102**
*Flattened wall showing sinusoidal composition of period and frequency*

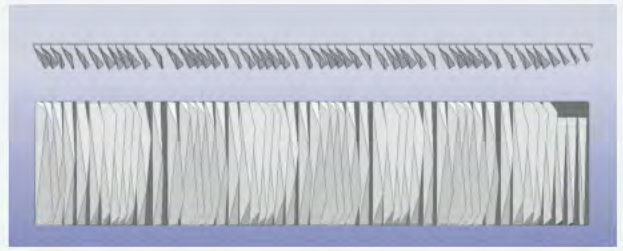


*Figure 7*→**102**
*Pavilion wall composition, showing the amorphous effect of the folded wall components*

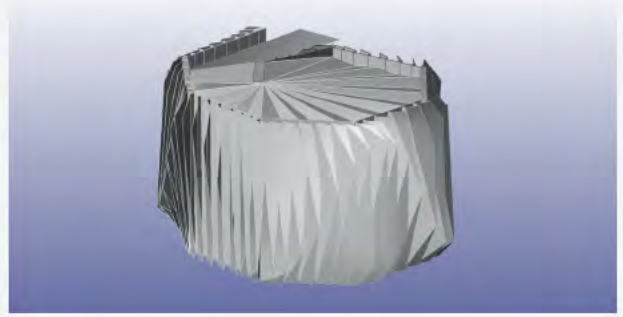




*Figure 8*→**103**
*Fabrication and on-site construction of the Fantastic Form*

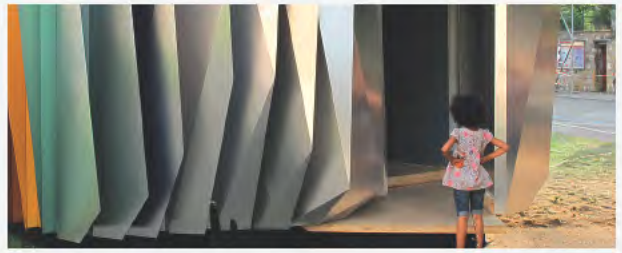


*Figure 9*→**104**
*Fantastic, uncanny or marvellous?*



*Figure 10*→**104**
*The Fantastic Form, Neuchâtel*



*Figure 1*→**109**
*Passing on knowledge and cooking for others. (Photo: MG)*

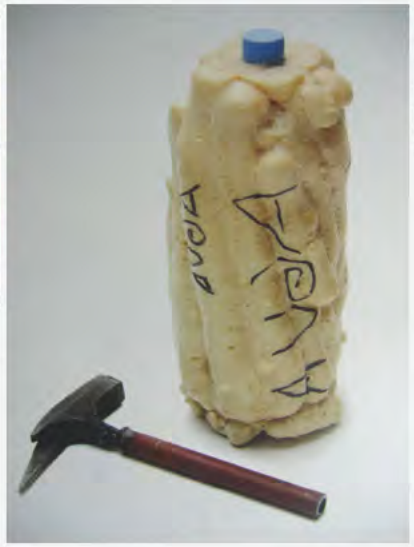


*Figure 2*→**109**
*Non-intentional design: tools improvised by workers on a construction site (Photo: Juli Capella)*



*Figure 3*→**109**
*Following the rule… almost. (Photo: MG)*








*Figure 4*→**111**
*Anna Pla, This is not a graffitti, urban intervention, 2003, Barcelona. (Photo: Anna Pla) Looking for the gaps and loop holes in town-planning regulations, the architect Anna Plà develops the project ‹This is not a graffiti›. She rents a parking space on the street, but instead of using it for parking her car, she sets up temporary domestic situations: half an hour for having a tea, two hours for sleeping, working on the computer, baby-sitting… Anna Pla's contingent home questions the nature of micro-contracts and micro-transactions agreed between individuals and institutions.*

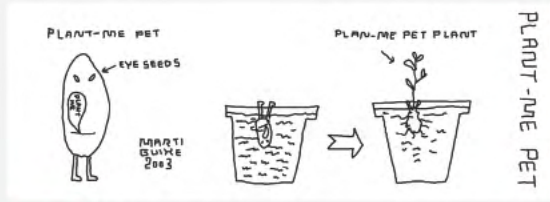





*Figure 5*→**111**
*Marti Guixé, Plant me Pet, 2003. Produced by Cha-Cha, Barcelona. (Photo: Imagekontainer/ Knölke) Marti Guixé has developed a personal and influential aesthetic of instruction manuals, as a way to raise awareness on issues of agency and participation. But giving instructions to poetic objects reminds that the fine line between critical and conventional design is still there… After all, design is a process, which is concerned with the control over the form of objects and environments. In doing so, Guixé makes explicit the social codes of design and unveils its mechanisms of power.*



*Figure 6*→**111**
*Hella Jongerius, Long neck and groove bottles Vases, 2000. Amsterdam. (Photo: MG) Some designers explore the handmade in all its facets, from virtuous craft to handy DIY. The gender distinction in amateur crafts pointed out by Attfield, blurs away when male designers opt for macramé techniques (Marcel Wander's Knotted chair) and women designers go for ‹rough&ready› DIY solutions. As example, the vases by Hella Jongerious result from the radical assemblage of glass and ceramics through masking tape.*



*Figure 7*→**112**
*Anthony Dunne and Fiona Raby, Electro-Draught Excluder, from the Placebo series, 2001, London. (Photo: MG) Anthony Dunne and Fiona Raby are interested in the ethical impact of new technologies in everyday life. Designing for ‹fragile personalities in anxious times› developed objects to help people overcome phobias, anxieties and other paranoia generated by the everyday ‹invisible design› that surround us: electro waves, magnetic fields, noise, etc. Here, the Electro-Draught Excluder is a screen able to stop radiations and provide emotional comfort and trust to the user.*



*Figure 8*→**113**
*View of the Wouldn't it be nice… exhibition in Zurich*

*Figure 9*→**113**
*View of the exhibition Out of the Ordinary in London. (Photo: V&A Press material)*



Regina Peldszus,
Hilary Dalke **Spaceflight Settings as Laboratory for Critical Design**





Figure 1→**121**
Reality versus fiction: A mock-up at the Graphic Research Facility at NASA Johnson Space Center; and director Duncan Jones on the set construction of Moon (Images: NASA; Liberty Films)

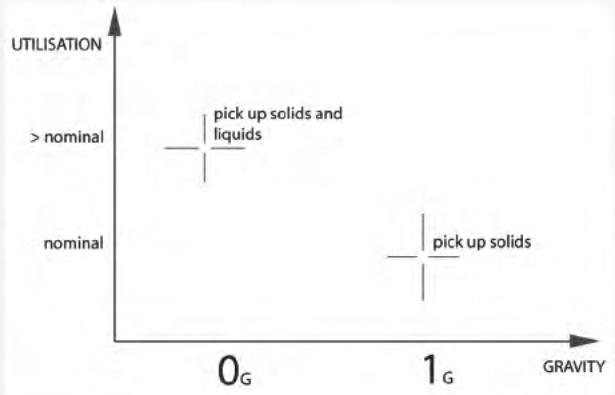



Figure 2→**125**
The changing potential of the usability of a pair of chopsticks when the parameter of gravity is changed.

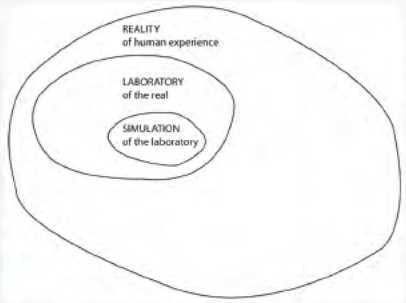



Figure 3→**128**
The layered relationships of the simulated space settings as laboratory for real conditions.





Figure 4→**129**
Visiting habitable snow structures during in Swedish Lappland during polar winter; construction of a Tetris-style inflatable prototype.

Jan Eckert, Marco Mason
**From Social Relevances to Design Issues**




Figure 1→**153**
WebGIS applications at disposal of Venice's citizens

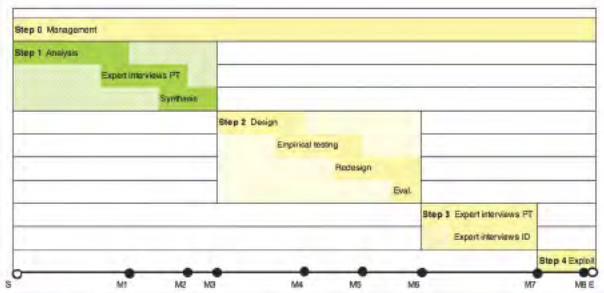



Figure 1→160
Project steps of the research project Visual Rhetoric 2: Rules and Scope in Public Transport Information Design. Project step 1, marked in green, will be presented in detail in section 2 of this paper.

| | | |
|---|---|---|
| recognisability | - use corporate colours & logo<br>- same colour for same function<br>- same placement and sequence for same information | L |
| conciseness | - limitation of stylistic devices (colours, fonts, sizes)<br>- icon instead of text<br>- reduction to most important information<br>- location of information at points of decision (crossways, entrances/exits)<br>- no advertising close to important information | L |
| Security | - provide clear view (e.g. via survey maps)<br>- always inform in the same way<br>- use low radiant light (for good recognition of persons) | E<br>P |
| Comfort | - use warm light and colours<br>- avoid light reflections<br>- use visually and haptically convenient materials | P |

Table 1→164
Selection of intended effects and corresponding creative means figuring in public transport design manuals



Figure 2→164
Rating of intended goals according to the analysis of public transport design rule manuals: <core> - <important> - <less important (or maybe underestimated)>. Colours mark the rhetorical dimensions logos (yellow), ethos (green) and pathos (red).

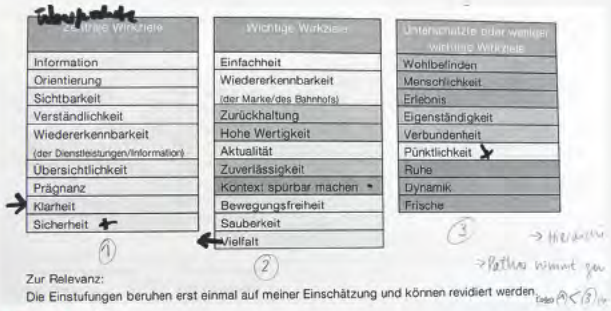



Figure 3→164
Revised and shortened version of the rating (similar concepts were merged). Instead of distinguishing between core and important goals, the idea came up to talk of <superordinate> versus <subordinate> intended effects.

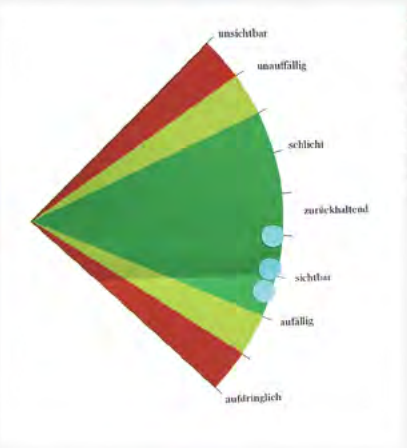



Figure 4→165
Example of a first attempt of arranging effect grades on a <speedometer scale>: <Visibility>, with the two extremes <invisible> and <obtrusive>. The blue dots show the ratings by three different viewers of the public transport map of the city of Basel (all in the area of <visible> - one closer to <eye-catching>, the other closer to <reserved>).

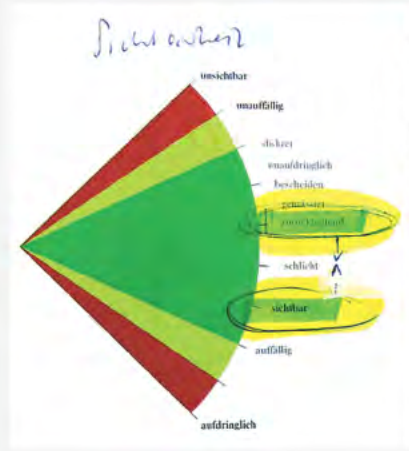



Figure 5→165
Highlighted are two intended effects often found in public transport design manuals (<reserved>, <visible>). The arrows indicate a conflict or contrast between these effects. This might identify a typical problem of public transport info mation design: information such as a timetable or rail track signpost must be visible, but at the same time tends towards restraint and clearly avoids any obtrusiveness.



Figure 6→165
Poster arranging the effects of public transport information design on a rhetorical matrix. Vertical axis: logos, ethos, pathos, horizontal axis: low, middle, high strength of effect. Blue: effects of public transport information design, purple: effects of commercial graphics, lime green: products of commercial graphics




Figure 7→165
<Superordinate> effects of information design that refused positioning on the matrix in figure 6 (e.g. visible, comprehensive, informative, recognisable).



Figure 8→166
Detail of a collage of public transport information design found in various Swiss train stations, arranged by station area and type of information carrier (e.g. logo, clock, screen).



Figure 9→167
Chosen design objects: departure timetable (yellow) and train formation poster (blue).



Figure 1→176
Some of the prototypes developed for stage 1



Figure 2→176
Activation button standing out in colour, position and relief, was used enthusiastically, the flat keyboard was ignored



Figure 3→176
The mother tries to motivate the child to press a button on a flat keyboard



Figure 4→176
Tearing off keys is more interesting than pressing them, especially if they don't work

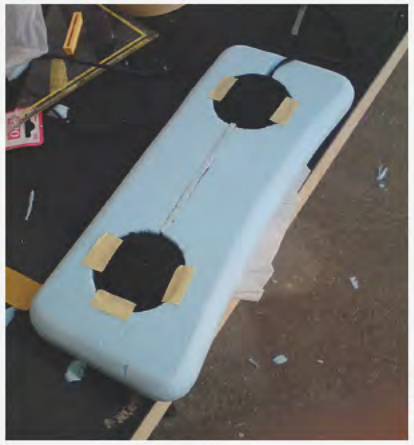


Figure 5→177
Prototype with built in speakers (reverse). Sounds triggered manually to simulate interaction

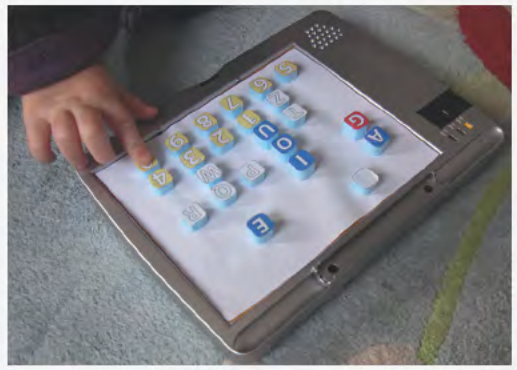


Figure 6→177
Learning computer with covered activation button, new surface and keys added

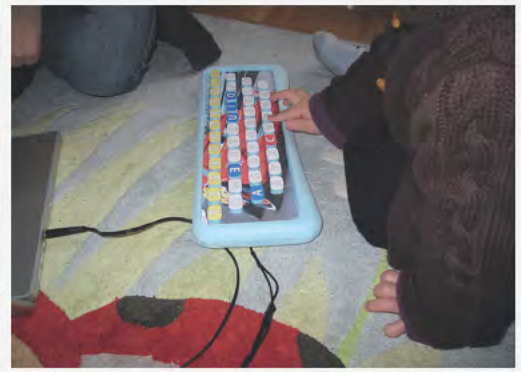


Figure 7→178
Prototype with integrated speakers to simulate an interaction through replayed audio files



Figure 8→178
Prototype with keys using pressure points made out of foam

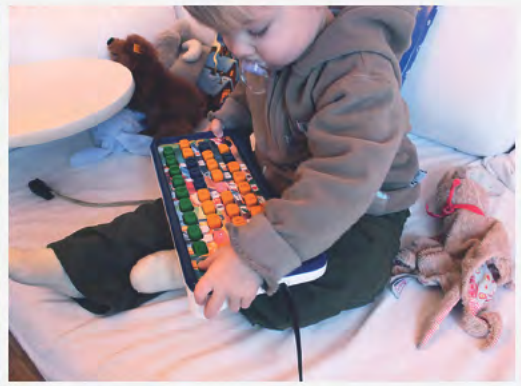


Figure 9→179
Child comfortable with keyboard prototype

*Anusha Iyer,*
*Dries De Roeck*
**Empowering people to connect & create with smart technology**

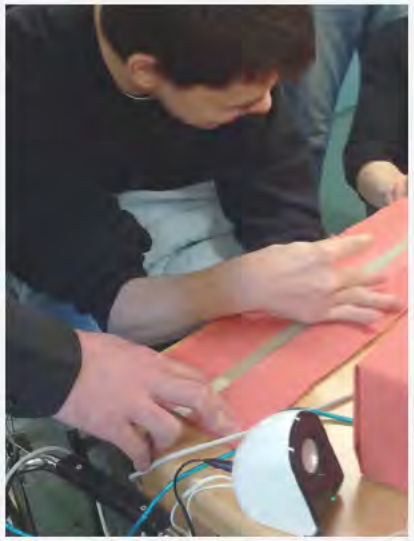




*Figure 2*→**186**
*Door sensor with air freshner.*

*Figure 1*→**186**
*Slide sensor being tried out by an end-user at Rinnekoti-Säätiö*

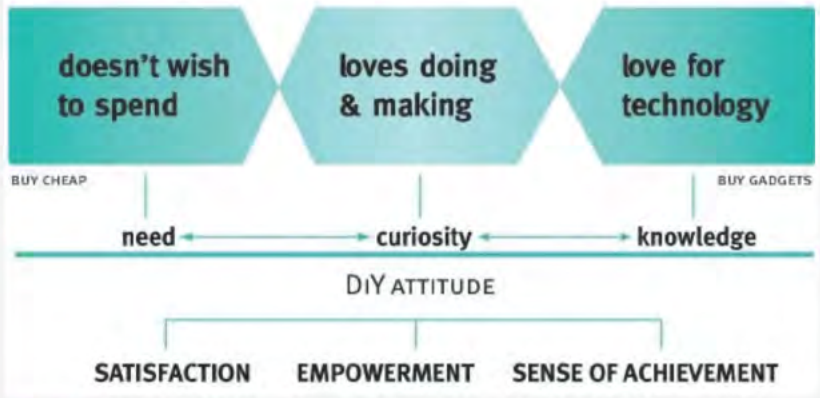



*Figure 3*→**188**
*Mapping the driving forces of DiY attitude and its effects.*

*Chris Hand, Anab Jain, Tessy Britton, Graham Burnett, Darryl Chen, Christopher Collett, Sanjiv Sharma, Charlie Tims, Liam Young*
**The Power of 8: Encouraging Collaborative DIY Futures**

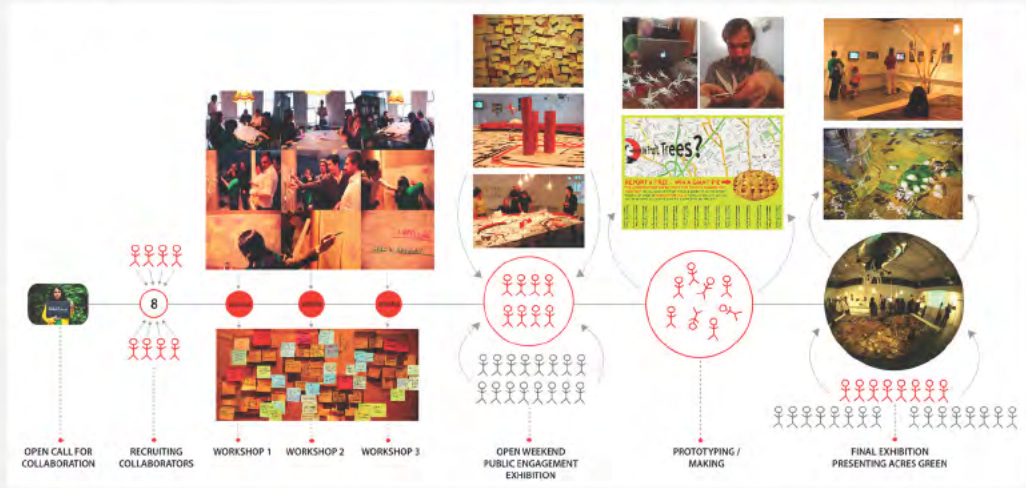



*Figure 1*→**197**
*<Power of 8> Process Map*




*Figure 2*→**198**
*Letter Writing Campaign*



*Figure 3*→**198**
*Scenes from Workshops*

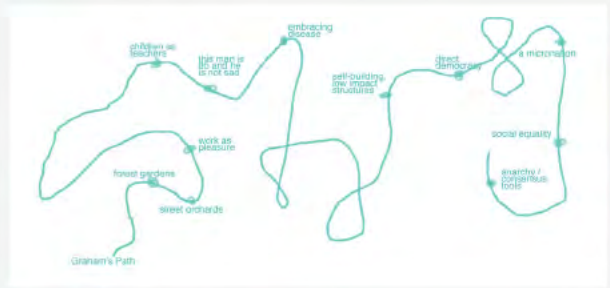



*Figure 4*→**199**
*Example One - Path*



*Figure 5*→**199**
*Example One - Sketch*

Chris Hand, Anab Jain, Tessy Britton, Graham Burnett, Darryl Chen, Christopher Collett, Sanjiv Sharma, Charlie Tims, Liam Young **The Power of 8: Encouraging Collaborative DIY Futures**

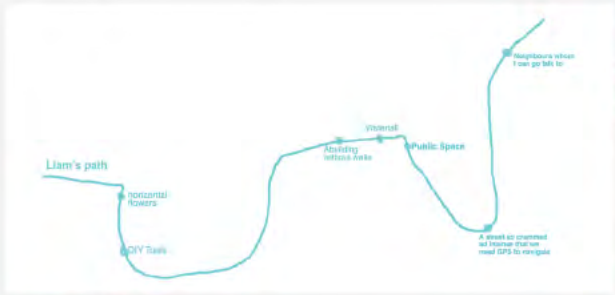



Figure 6→**200**
Example Two - Path



Figure 7→**200**
Example Two - Sketch

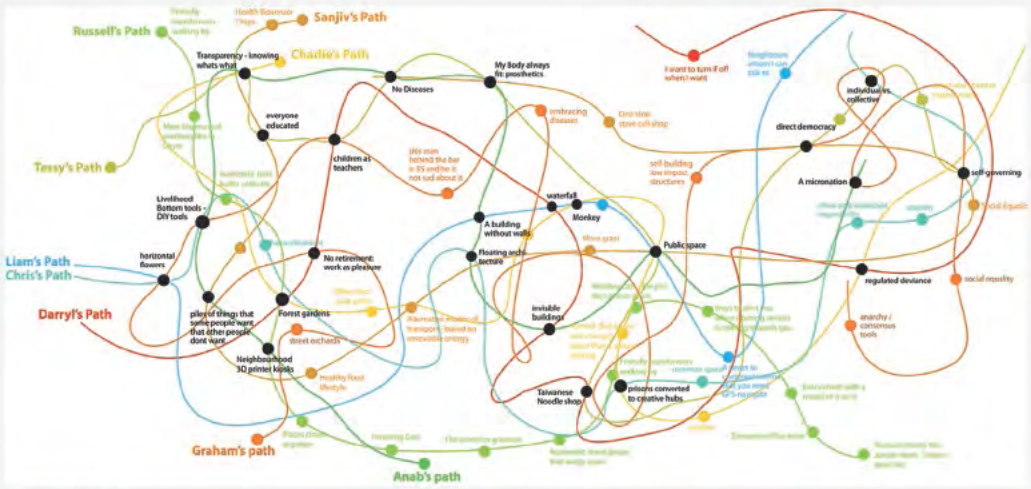



Figure 8→**200**
The <Tube Map of Convergence>

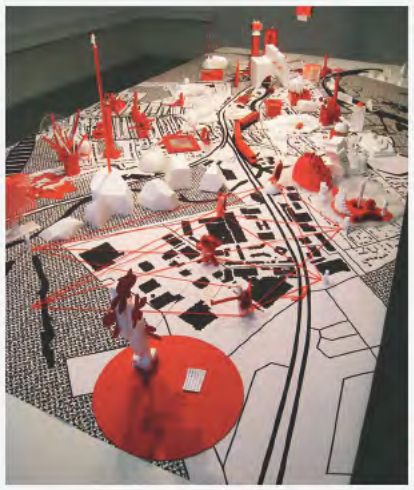


Figure 9→**201**
Results from Open Weekend




Figure 10→**201**
Tree Prosthesis and Feral Cider

Figure 11→**201**
Bioengineering of the Beamer Bees

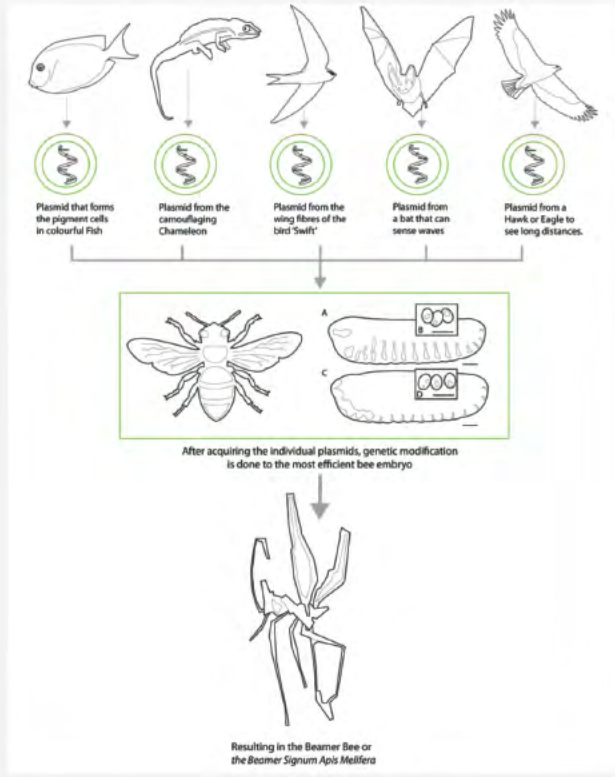





Figure 12→**202**
Young girl keeps a glowing bee as a bedside pet



Figure 13→**202**
Bees in Acres Green

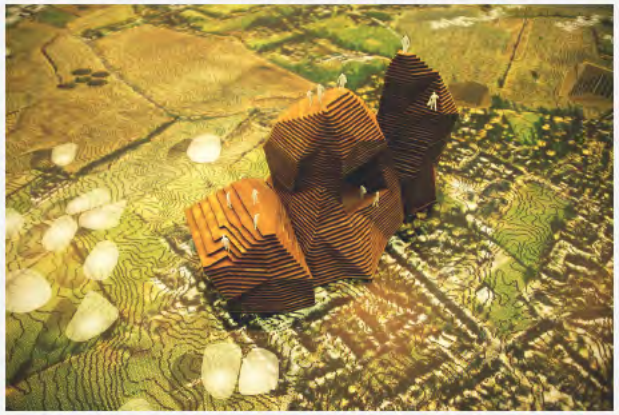


Figure 14→**202**
Aerial view of living hills and flocking clouds in Acres Green

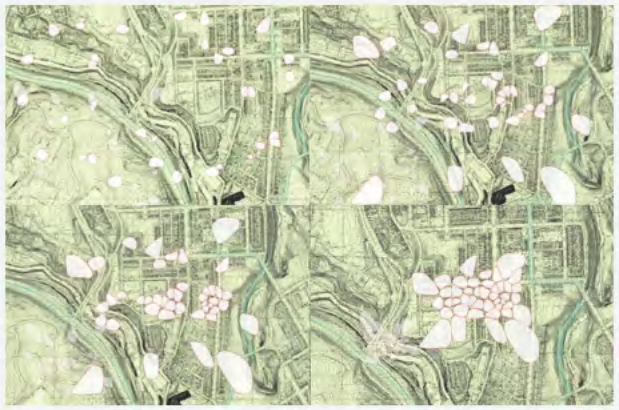


Figure 15→**202**
Flocking Clouds Tessellate, Bringing Rain to Where it is Needed



Figure 16→**202**
A Single Glowing Cloud provides company on a late night walk home

## Impressum

This book collects the contributions
of the 6th Swiss Design Network Conference
‹negotiating futures — design fiction›
held on October 28-30, 2010 in Basel,
Switzerland.

Copyright
© 2010 Swiss Design Network.
All rights reserved.

Editor and Distribution
Swiss Design Network

Concept and Editing
Academy of Art and Design, University
of Applied Sciences Northwestern Switzerland

Project Team
Flavia Caviezel, Nicole Flückiger, Simon Grand,
Samuel Hanselmann, Peter Jezler, Fabian Kempter,
Laurent Marti, Françoise Payot, Michael Renner,
Andreas Simon, Suresh Surenthiran, Jan Torpus,
Heinz Wagner, Martin Wiedmer, Florence Zumbihl

Graphic Design
Benedikt Jäggi

Printing
Steudler Press, Basel

Bookbinding
Postpress Henssler, Basel

Edition:
1000 Ex.

SWISSDESIGNNETWORK

Martin Wiedmer
President of the Swiss Design Network
Institute for Research in Art and Design HGK FHNW
Steinentorstrasse 30
CH-4051 Basel
martin.wiedmer@fhnw.ch

ISBN
978-3-9523662-1-9

Host

n|w University of Applied Sciences Northwestern Switzerland
Academy of Art and Design

SWISSDESIGNNETWORK

Technical Partners

KONNEX
EVENTS DESIGN TECHNIK

JVC
The Perfect Experience