Digital mind - one of the ways to immortality

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As a priority new ideology must adopt the usage of a singular breakthrough technologies to improve the man himself but not just its habitat. The main line of technological singularity formation is now focused on creating an artificial brain - the "Digital Man". The singularity point of this program could be the creation the neurochip having 10^{16} transactions per second and energy consumption should not exceed 100 watts per chip, which is close to the power consumption of the human brain cortex - 20 watts. This will move planned in Russia in 2045 the point of singularity for neurocomputer for 2020.

Humanity has become a consumer society and is on the verge of a total loss of sense guidelines of development. Interests of the majority of people were mainly to maintain their own comfortable existence.

Modern civilization with its space stations, nuclear submarines, iPhones and Segway is not able to save people from the disabled body, disease and death.

We are not satisfied with today's scientific and technological progress. Science, working to meet the needs of the consumer society, cannot provide a technological breakthrough.

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We believe that we can eliminate aging and even death, to overcome the fundamental limits of physical and mental abilities, given the limitations of the biological body.

Scientists around the world have developed some techniques that can ensure the creation of an artificial human body prototype within the next decade. The country, which first announced his intention to combine these technologies and to

create a working cybernetic organism, will become the leader of the world's main technological project of modernity.

Today the society has developed new philosophical doctrine, called the technological singularity. We can assume that the first point of technological singularity is a human genome sequencing be the company “Celera Genomics” in 2000 and the creation of the first synthetic life form in 2010 by Craig Venter. Actually Venter has created the first “self-replicating machine”.

The second point of technological singularity may occur due to the development of nanotechnology, which was considered in report of the United States Congress Joint Economic Committee in 2007. As the start date of the singularity is called 2020 or even 2030. The main line of singularity formation is now focused on creating an artificial brain - the "Digital Man". http://vz.ru/opinions/2012/10/25/604264.html

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I would like to express my view on the problem of digital mind and look beyond the horizon of events after the point of singularity.

Digital Mind. Technical Implementation.

According to forecasts of IBM experts, a mathematical model will be able to repeat what is in each person's head - 10 billion neurons, each of which has up to 10,000 axonal connections, if it has 880,000 processors of the von Neumann architecture, or $4.4 \cdot 10^{23}$ logic elements (gates and memory cells). IBM is planning to enter the value of computing power is not before 2019. Unfortunately, such systems will require ekzaflops capacity from 100 to 500 MW, which is comparable to the energy consumption of a small town. Question their reliability and energy consumption occurs. This limits the operation of modern supercomputers several dozen hours.

The human brain has a large reserve of safety due to the tenfold of duplication. As a result, only 10% of the cortex effectively works - $1.5 \cdot 10^{16}$ logic gates. Thus brain consumes energy is not more than 20 watts.

Naturally, the transition to the neural network processing of information, that is to neurocomputer, is more realistic way of approaching the point of singularity. Therefore, IBM is also working on creating neurochips on 45 nm silicon technology jointly with the DARPA on the program SyNAPSE (Systems of Neuromorphic Adaptive Plastic Scalable Electronics).

The U.S. program of "Human Connectome Project" to which they appropriate funds $ 3 billion, and EU program «Human Brain Project», which is planned to appropriate funds more than € 1.2 billion will be an important step

towards the creation of artificial intelligence. The human mind and its neural connections will be studied in the framework of projects for 10 years. The unprecedented scale of projects financing allows to put them in line with the Human Genome Project, Center for Nuclear Research CERN, or flying to the Moon or Mars.

The singularity point of the program "Digital Man" could be the creation the neurochip having 10^{16} transactions per second in energy consumption in 10^{17} operations per joule. That is, no more than 100 watts per chip, which is close to the power consumption of the human brain cortex - 20 watts.

We do not consider optical (and holographic) and quantum neuroprocessors due to lack of prospects in their technological implementation for associations in 10^{16} logic elements. Furthermore, quantum processes on separate atoms are possible only at cryogenic temperatures. At high temperatures, the "active" atoms are diffused into the substrate ...

Now technological capabilities of nanoelectronics (topological norms 16 nm) achieved their physical limit, since a short circuit occurs due to tunneling currents if the distance between the electrodes is less than 7.25 nm. Consequently, Moore's Law for 2D topology stops working. The only way is to move into the third dimension - 3D topology. Only with this topology one can obtain 10^4 layers with 10^4 branches per neuron. Thus, each layer should have a 10^4 times less energy consumption. This requires a reduction in energy consumption by one logical operation about 9 orders of magnitude!

On the contemporary silicon electronic components, based on the using of current modes of controlling by signals, to achieve this impossible! We emphasize that these nonoperating items consume energy as the leakage currents flow through this elements.

Only the transition from the current mode in logic elements of supercomputers and neurocomputers on silicon technology to single-electron mode for information processing using electron spin characteristics (spintronics) will solve this problem. In this mode, energy is consumed only at the moment of switching, and information can be stored indefinitely in the OFF state, even without a power supply and at high temperatures.

We have developed and patented neural-like elements with memory operating in the single mode. It is possible to reduce the power consumption by one logical operation on 9 orders (US Patent 6,570,224 B1 http://www.google.com/patents/US6570224). The using of neuro architecture reduces the number of logic elements to the number of elements that are active in the human brain cortex - $1.5 \cdot 10^{16}$. In volume 10 cm^3 could be effectively pack the entire cortex of the human brain.

Unfortunately, the fabrication of multilayered (more than 100 layers) of cells based on the existing parallel photolithographic techniques is impossible. These methods also not allow to create chips with the underlying individual properties (transfer of man's intellect to the digit). Therefore, we are developing the technology sequential nanojet 3D nanolithography to generate up to 10,000 layers. (EP 1953117 http://www.google.com/patents/EP1953117A4?cl=en).

The basis of our proposal is the revolutionary transition from analog imaging techniques to digital chips. Introduction of jet nanolithography (3D nanoprinter) is equivalent to the level of the transition from film to digital photography. This may be one of the pillars of the third industrial revolution http://www.tpp-inform.ru/global/4384.html. The implementation of these techniques will move planned in Russia in 2045 the point of singularity for neurocomputer for 2020.

We are sure that such an ambitious goal is not impossible. This clearly illustrates an example of a low-budget ($ 15 million) to a private company Celera Genomics, headed by K. Venter, who first deciphered the human genome.

Evaluations show that the intellect and speed of information processing neurochip by our technology can exceed 200 times the same parameters of the human brain. Who will manage this intellect, he will rule the world!

However, there is a question about the development of the superintellect and who will work by "God", "on" and "off" switch.

Philosophical problem. Looking beyond the event horizon after a point singularity

Death of the individual is a factor of social development. Old ideas is dying out, new ideas is born. Eternal life will lead to eternal stagnation.

We see a solution to this problem due to the aspirations of mankind to establish contacts with other space civilizations.

Further development of mankind in the form of creating super intellect, does not require space expansion in the form of humanity settlement in the galaxy. We have enough of our cradle - the solar system. Further expansion of humanity is only possible information - through the galactic Internet. This is due to the fact that the maximum speed of condensed matter without its destruction does not exceed one five-hundredth the speed of light.

In "Manifesto: Galactic Internet", describes the possibility of realizing the dream of mankind contact with extraterrestrial civilizations through the galactic Internet.