What’s Inside

Greetings from the HFES Student Council President...........................................................2
New HF Design Blog..................................................................................................................3
Congratulations to Graduates..................................................................................................4
Task Analysis Tools in Action....................................................................................................5
Spotlight on HFAC Research Scientists................................................................................8
Spotlight on HFAC Post Docs..................................................................................................9
Distractions N’ Driving Team Update....................................................................................10
HFAC Alumni Career Panel....................................................................................................11
Dr. Kevin Corker Outstanding Student Award......................................................................13
Publications, Proceedings, Patents, and Awards....................................................................14
Announcements.........................................................................................................................16

HFES Student Executive Council

<table>
<thead>
<tr>
<th>President</th>
<th>Vice President</th>
<th>Treasurer</th>
<th>Secretary</th>
<th>Webmaster</th>
<th>NEM Co-Chair</th>
<th>CHI President</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haneen Saqer</td>
<td>Nicole Werner</td>
<td>Brian Taylor</td>
<td>Adam Emfield</td>
<td>Daniel Roberts</td>
<td>Erik Nelson</td>
<td>William Miller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Philip Jones</td>
</tr>
</tbody>
</table>

The Archie   -  Spring 2011
Greetings From the HFES Student Council President

Submitted by Haneen Saqer

In the 2010-2011 academic year, the HFES Student Chapter continued its legacy of achievement, outreach, and fellowship. This spring, four of our doctoral students successfully defended their dissertations and nine students received their masters degrees. The student chapter also won the first place $1,000 cash prize in the “What is Human Factors/Ergonomics?” YouTube Video Contest sponsored by HFES National. Spearheaded by Ewart de Visser and Dr. Tyler Shaw, the rap video highlights the field of human factors and the types of research conducted in the Arch Lab. (Check it out for yourself: http://www.youtube.com/watch?v=HJMpajaLEeY.) As part of this year’s National Ergonomics Month (NEM) action plan, Philip Jones and Daniel Roberts developed a Human Factors blog for the student group (www.hfac.gmu.edu/blog/) where users can submit examples of best and worst designs of everyday objects. The student group also continued its outreach efforts to educate young drivers on the dangers of distracted driving. Students from the Distractions N’ Driving team have received several invitations to present at local area high schools and are currently collaborating with the Fairfax County Court System to speak to students at their license ceremony (see story on page 10). Finally, the student chapter hosted many social events. In February, several students ventured to White Tail for a weekend of skiing and camaraderie. Other events included the annual bake-off (this year featuring the inclusion of a savory category), the end-of year barbecue, and an alumni career panel.

I am honored and privileged to have had the opportunity to serve as the HFES Student Chapter President this year. I am pleased to pass the reigns to Nicole Werner, your president for the 2011-2012 academic year. As Vice President this year, Nicole was pivotal in the success of the chapter and I am certain she will lead an enthusiastic executive council to great heights!

Semester Highlights - End of Year Bake-Off

On the left, Arch Labbers show off their baking talents (with the addition of a savory category this year). In the photo on the right, showing off their eating talents while enjoying the submissions.
The Design Blog is a new GMU Arch Lab production that is already triggering discussion. Recently launched at the close of the Spring 2011 semester, it is an initiative of the entire Executive Council, led by Philip Jones and Dan Roberts.

Hot Or Not, human factors style. Can’t get more simple than that. You submit pictures and/or links to well- or terribly-designed anything, then look through other submissions to tell everyone what you think with a thumbs up or down and a comment. While the intention was initially to focus strictly on human factors-related posts, the prevalence of design in everyday life invites a more broadly accepting content strategy. Sites that thrive on user reactions and commentary have a natural need for a user-centered design process to increase engagement in the short and long-term. We have prioritized user interactivity elements of the ordinary blog layout with a focus on being seamless and intuitive, and are constantly evolving as the Design Blog steadily takes off.

The second most important feature is naturally the user submission process. Any website lives or dies by its users, and as our content is community-sourced, it has been imperative that we focus on making the submission process as seamless and streamlined as possible. This is another area where user feedback will enable our mission to continue improving every aspect of the site.

Iteration through feedback and testing has been central to the process from the early stages of determining the mission, features, and design of the Design Blog. The persistence of the categorization “blog” reveals the original vision for the site. After the Executive Council agreed to build a website, I sketched several concepts and explained them to colleagues. The direction we finally decided upon includes interactive elements similar to other popular websites, while focusing the content on a deceptively broad view of the world. Obviously, this determination was only the first step. After choosing a platform (Wordpress) and web hosting (generously provided by the Arch Lab), I began customizing the visual design and underlying functionality with the incredible assistance of Dan Roberts. Over the next few months, an increasingly functional and aesthetic website began to emerge.

We periodically presented the work in progress to the Executive Council as a focus group-esque review session. Every week, we would leave the meeting with dozens of tasks involving fixes, recommendations, or wishes. From then, we gathered some sample content, and continued to test more users to see interactions from a different perspective. Finally, I presented it to the Arch Lab at the final brownbag of the year.

That’s where you come in. I need your help to keep improving this project. We’ve always made it clear that user-centered design is our first priority (how meta). Even a brand-new name may be chosen after leaving nominations open!

Please check it out at http://hfac.gmu.edu/blog and let us know about not only site suggestions, but the best- or worst-designed interaction you’ve experienced today!

Philip Jones is a 2011 Arch Lab MA graduate who works at Metron Aviation and does side projects like this as half of b’blogic [http://bblogic.co].
Congratulations to the Arch Lab Ph.D. graduates who successfully defended their dissertations this year: Gregory Anderson, David Cades, John Fedota, and David Kidd!

And congratulations to the Masters students who graduated this year!
Raja Parasuraman describes neuroergonomics as the combination of neuroscience, human factors, and engineering psychology with the aim of optimizing mental functioning during cognitive and physical activities. Neuroergonomics places an emphasis on non-invasive and ubiquitous data collection, analyzing differences between individuals, and the importance of collecting data in natural environments. Mobile computing can be used to satisfy the goals of neuroergonomics, due to the built-in sensing capacities of these devices, ability for these devices to collect repeated and longitudinal data, and the ubiquity of smart phones.

When developing a smart phone application that collects repeated and longitudinal data, it is important to consider both the costs and benefits that collecting the data has to the user. In light of this, we tested an iPhone application called Proactive Sleep, which tracks daily sleep and behaviors that relate to sleep hygiene. Specifically, we evaluated the retrospective data input feature of the Proactive Sleep application using human factors design principles learned in Peter Squire’s Task Analysis course, which included: Verbal Protocols, Hierarchical task analyses, Goals, Operators, Methods, and Selection Rules (GOMS) models, and survey data.

We identified numerous flaws with the old system of retrospective data input (see Fig. 1). The interface was cumbersome because in order to enter in a habit, participants first had to activate the habit by pressing the <On/Off> button – an unnecessary step. The quantification system did not conform to mental models because every habit was on a 1-3 Likert scale. Yet people think of habits like drinking and smoking in terms of a continuous amount (i.e. how many cigarettes did you smoke?). Lastly, entering in sleep took an unnecessarily long time because participants had to enter the amount and time of sleep separately and had to repeatedly press a button to incrementally increase the sleep amount.

![Figure 1](image_url)
We addressed these problems and developed a modified system for monitoring sleep and behaviors related to sleep (see Fig. 2). The leftmost figure illustrates the revised sleep editing view. Now there are only two ways to interact with the screen, editing a bedtime and editing a wake-time. The rightmost image depicts the habits view, which is now in a separate screen. When a habit is clicked, a specific question is asked of the user, such as, “How many cigarettes did you smoke today?” and the user selects the amount and then presses done. Depending on whether the amount is a healthy, medium healthy, or unhealthy amount, the icon will turn green, yellow, or red, respectively.

![Image of a phone showing sleep and habits editing](image)

**Figure 2**

We then conducted an experiment where we gave participants one of the two interfaces, timed how long it took them to enter their habits, and administered a survey. The GOMS model we developed closely matched the behavioral data that we collected. We successfully decreased how long it took participants to enter in their sleep data, though it took longer for them to enter their habits data in the new system. More importantly, the survey results indicated that the redesigned application was an improvement over the old interface. Even though participants took longer to enter their habits in the new interface, it was rated as easier to use. Explanations include that the new interface conformed better to the user’s mental model of the habit and/or that the new interface is simply more aesthetically appealing than the old interface.

This study represents a first step in developing an interface that enables data collection of a wide-variety of behaviors in a naturalistic environment – a requirement of neuroergonomics. We used tools learned in Task Analysis to identify problems with the application and evaluate the effectiveness of our solutions. This demonstrated that task analysis tools can be used to successfully evaluate systems and designs.
Semester Highlights - Arch Lab Ski Trip

The Arch Lab ski trip group arrives for their first day at Whitetail.

Phil and Christian on the ski lift at Whitetail

The Arch Lab ski trip group on their second day at the slopes.
Sandra Pierson has spent most of her career as an airline pilot and she helped create the training programs for several airlines. She is now finishing her doctorate of education degree (ABD) with specialities in adult education, curriculum development and program evaluation. Sandra’s dissertation is on comparing learner perceptions of adult drivers completing either a classroom or online driver improvement course. Currently, Sandra is working on several FAA 'NextGen' studies with Dr. Deborah Boehm-Davis including investigating the effect of situation awareness on the loss of 'partyline' (voice communications) vs. data communications and exploring various feedback variables in distance education (geared toward airline training).

Kelley Baker is a Research Associate in the Arch Lab. She holds a B.S. in Chemical Engineering from Rice University and an M.A. in Psychology (HFAC) from George Mason University. Prior to joining George Mason, she was an engineer and Quality Assurance Manager at MPR Associates, an engineering services company in Alexandria, VA.

Since 2008, Kelley has been a member of the research team of Dr. Deborah Boehm-Davis. Her research has focused on aviation human factors issues specific to the Next Generation Air Transportation System (NextGen) and medical human factors.

Sara Gee is research faculty working on Dr. Deborah Boehm-Davis’ aviation research team. She holds a B.A. in both Psychology and Cognitive Science from Case Western Reserve University and an M.A. in Psychology from George Mason University. Sara started working with Dr. Boehm-Davis in 2008 as a master’s student and became a full-time research associate in 2009.

Since joining the research team, Sara’s work has centered on human factors issues specific to the Federal Aviation Administration’s Next Generation Air Transportation System (NextGen). Her main area of focus has been to investigate human factor issues surrounding the use of data communication (data comm) between the flight deck and air traffic control, display requirements for flight deck data comm displays and controls.

Lara Moody graduated from Davidson College in 2009 with a BS in psychology and concentration in neuroscience. After spending a year as a Howard Hughes Medical Institute Fellow studying the hippocampal region in rats, she moved on to work with human participants doing neuroimaging and behavioral studies with Dr. Frank Krueger and Dr. Raja Parasuraman at GMU.

Currently, she is working on two studies; one looks at neural activation while rating ones beliefs about free will and determinism and the other looks at economic and emotional decision making while under the influence of a drug that promotes social behavior.

Sara Gee is a Research Associate in the Arch Lab. She holds a B.S. in Chemical Engineering from Rice University and an M.A. in Psychology (HFAC) from George Mason University. Prior to joining George Mason, she was an engineer and Quality Assurance Manager at MPR Associates, an engineering services company in Alexandria, VA.

Since 2008, Kelley has been a member of the research team of Dr. Deborah Boehm-Davis. Her research has focused on aviation human factors issues specific to the Next Generation Air Transportation System (NextGen) and medical human factors.

Sara Gee is research faculty working on Dr. Deborah Boehm-Davis’ aviation research team. She holds a B.A. in both Psychology and Cognitive Science from Case Western Reserve University and an M.A. in Psychology from George Mason University. Sara started working with Dr. Boehm-Davis in 2008 as a master’s student and became a full-time research associate in 2009.

Since joining the research team, Sara’s work has centered on human factors issues specific to the Federal Aviation Administration’s Next Generation Air Transportation System (NextGen). Her main area of focus has been to investigate human factor issues surrounding the use of data communication (data comm) between the flight deck and air traffic control, display requirements for flight deck data comm displays and controls.

Lara Moody graduated from Davidson College in 2009 with a BS in psychology and concentration in neuroscience. After spending a year as a Howard Hughes Medical Institute Fellow studying the hippocampal region in rats, she moved on to work with human participants doing neuroimaging and behavioral studies with Dr. Frank Krueger and Dr. Raja Parasuraman at GMU.

Currently, she is working on two studies; one looks at neural activation while rating ones beliefs about free will and determinism and the other looks at economic and emotional decision making while under the influence of a drug that promotes social behavior.

Sandra Pierson has spent most of her career as an airline pilot and she helped create the training programs for several airlines. She is now finishing her doctorate of education degree (ABD) with specialities in adult education, curriculum development and program evaluation. Sandra’s dissertation is on comparing learner perceptions of adult drivers completing either a classroom or online driver improvement course. Currently, Sandra is working on several FAA 'NextGen' studies with Dr. Deborah Boehm-Davis including investigating the effect of situation awareness on the loss of 'partyline' (voice communications) vs. data communications and exploring various feedback variables in distance education (geared toward airline training).
Maren Strenziok, PhD

Initially, Maren studied clinical and social psychology, then trained to become a cognitive behavior therapist, and worked with groups of violent and sexual offenders. After moving to the United States, Maren had the privilege to work with Jordan Grafman at the National Institutes of Health in Bethesda, Maryland, where she studied brain activation and structure associated with aggression in male adolescents for her PhD. This work, and her previous clinical experience, shaped her holistic view of the causes of aggressive behavior and her interest in how the brain works.

Maren’s current postdoctoral training with Raja Parasuraman and Pamela Greenwood in the Arch Lab allows her to advance her knowledge of neuroimaging methods and to cultivate her interest in training of brain function. In this position she has studied neural activation and white matter integrity associated with working memory and attention using fMRI and diffusion tensor imaging. Maren is most excited about the training study were they use video games to boost cognition and structural MRI to assess the effects of cognitive training on brain function. Cognitive training has already been used in psychiatric patients and older adults to mitigate the adverse effects of disease and aging on cognitive functioning, but the underlying changes in neuroanatomy associated with training are not well understood.

Her next project will bring her back to her roots. She will apply the training study scan protocol to a group of young adults to investigate neural plasticity associated with playing a video game that employs the concepts of dominance and aggression. In the future, Maren hopes to apply the knowledge that she gains here to an aggressive population to help develop neuroscience-informed treatment alternatives to psychotherapy and drugs.

Elisabeth Ploran, PhD

Elisabeth's interest in cognition began with humble origins in a small lab at Drew University headed by Patrick Dolan. After studying memory under his tutelage for three years, she moved on to grad school at the University of Pittsburgh, supervised by Mark E. Wheeler.

It was there that her sights were set on neuroscience, particularly the use of fMRI to investigate the brain with a systems-level perspective. Both her memory background and imaging experience will be useful in her current position, during which she is studying the neural substrates of the development, maintenance, and use of spatial memory during navigational tasks. She is working with Jim Thompson and Raja Parasuraman.
Distractions N’ Driving Team Expands Outreach Efforts

Submitted by Haneen Saqer

What started as a simple demonstration meant to educate students on the field of human factors has blossomed into an opportunity to educate hundreds of young drivers on the dangers of distracted driving.

In the previous edition of the Archie, we reported on the driving simulation that was used in the USA Science and Engineering Festival. Through connections with the Fairfax County Police Department, GMU graduate students were invited to present the driving demonstration to a captivated audience of over 600 high school students.

After listening to a brief presentation on driving statistics and research, pairs of high school students were asked to the stage to participate in the simulation. As one student drove the simulation course, the audience watched her performance on a large screen and tracked the student’s lane deviations, following speed, and braking patterns. After the first course was completed, she was instructed to drive the course again, this time while receiving and responding to text messages sent from her friend (also on stage).

“Ohhs” and “ahhs” bellowed from the audience as members witnessed each of the driver’s driving errors.

By the completion of four simulations, students witnessed first-hand the dangers of distracted driving and how quickly driving incidents can occur. Local media stations (WJLA ABC 7 and WAMU for NPR) covered the event.

Since then, the team has formalized the program and created a website - www.distractionsndriving.com. The team chose the name Distractions N’ Driving because the acronym, DND, also stands for “Do Not Disturb.” The team is currently working on implementing pledges whereby drivers vow not to drive while distracted and to speak up when they are passengers in vehicles of distracted drivers.

The DND team is also collaborating with local area AAA chapters to extend the reach of the program. Most recently, the team was invited by Chief Judge Hon. Thomas Mann of Fairfax County Juvenile and Domestic Relations District Court to present their program to recipients of new drivers at their driver’s licensing ceremony at the Fairfax County Courthouse.

For more details, pictures, and video of the presentations visit:

http://www.distractionsndriving.com


http://wamu.org/news/11/03/01/gmu_grad_students Teach Teens Dangers of Distracted Driving.php

Special thanks to the Distractions N Driving Team: Jesse Eisert, Christian Gonzalez, Bridget Lewis, Stephanie Pratt, Jonathon Strohl, and Ewart de Visser.
This semester we were honored to welcome back a group of HFAC Alumni who came to participate in a career panel. Pictured above from left to right is Jennifer Moore, Ciara Sibley, Jenna Beck, David Cades, and Raj Ratwani. The take away message of the day - Network, network, network! Some of the panel members even found their jobs through local HFES chapters. Alumni also stressed the importance of maintaining a responsible reputation within the small tight-knit human factors community. A big thank you to the members of this panel for coming to share their wisdom with the current students!

**Jennifer Moore**  
Masters 2008  
Currently at BMT Designers & Planners  
Previously at TASC Inc., Just Delicious Foods, Florida Atlantic University, Workforce Logic

**Ciara Sibley**  
Masters 2009  
Currently at Naval Research Laboratory

**Jenna Beck**  
Masters 2009  
Web usability, user experience  
Currently at Info Relay Online Systems  
Previously at DSCI, Wellpoint, US Census Bureau

**David Cades**  
PhD 2011  
Currently at Exponent Failure Analysis Associates  
Previously at Lighthouse International, The Robotics Academy, American Institutes for Research

**Raj Ratwani**  
PhD 2008  
Currently at Perceptronics  
Previously at Aptima, Naval Research Lab
The Arch Lab was well-represented at the GMU CHSS undergraduate research symposium this year. Our undergraduate research assistants (pictured below) had 3 posters in the symposium!

Here is George Buzzell with his poster which took home the award today for best poster related to work in information technology. George works under the advisement of Carryl Baldwin.

Here are (from left to right) Marilyn Vivanco, Hibah Khan, and Jessica Chang who work under the advisement of Deborah Boehm-Davis.

Here is Nick Penaranda with his poster at the symposium. Nick also works under the advisement of Carryl Baldwin.
This year the HFES student group worked with faculty to resurrect the Kevin Corker HFAC Outstanding Student Award. This award of five hundred dollars goes to the student of the Arch Lab who has excelled in research activities and who has demonstrated a commitment to the advancement of the Arch Lab (as determined by a faculty committee). The excerpt below is reprinted from an earlier edition of the Archie and explains the history of this prestigious award:

*One of our colleagues in the human factors profession, Dr. Kevin Corker, passed away this semester. In honor of his memory, Dr. Peter Hancock started the Kevin Corker Arch Lab Student Award on February 6th 2008 during his lecture to the Arch Lab.*

**Dr. Kevin Corker 1953 - 2008**

Dr. Corker was the former Director of the Graduate Program in Human Factors and Ergonomics. He was also a Professor of the Department of Industrial & Systems Engineering at San Jose State University. Dr. Corker published extensively on modeling of human and complex, dynamic and automated system interaction for applications from space operations, to commercial aviation safety, to military operations, to nuclear power plant operations.

Dr. Corker was a huge contributor to the college and loved mentoring his students. He was kind hearted and generous to all and lived his life with integrity and courage. Kevin enjoyed sailing, time spent with family and friends, reading, traveling and the outdoors. Dr. Corker's proudest career achievement was realized when he became a Professor and Associate Dean of the College of Engineering at San Jose State University. As a scholar and teacher, Kevin's passion was sharing his knowledge. This commitment was recognized by earning the Teacher of the Year award for the College of Engineering in 2005 along with numerous other professional awards and recognitions. In the spirit of Dr. Corker’s bright and generous personality, this Annual Kevin Corker Arch Lab Student Award is in recognition for the student who has contributed significantly to the advancement of the Arch Lab.

We are pleased to announce that the recipient of this year’s award is Haneen Saqer. Haneen is a second year doctoral student in the Human Factors and Applied Cognition Program. She received her Bachelor of Arts in Psychology with minors in Biology and Environmental Studies from Trinity University in San Antonio, TX in 2001 and a Master of Health Administration from Washington University in St. Louis, MO in 2003. She returns to psychology after ten years of experience as a consultant and health care administrator. Haneen is currently working with Dr. Raja Parasuraman and Dr. Matt Peterson on projects related to automation, attention, and situation awareness.

* Reprinted from The Archie, Spring 2008


Clarke, E., Andrews, A., Espeseth, T., Parasuraman, R., Greenwood, P.M., Fu, S. (under review). Visuospatial attention influences mental representation in working memory as reflected in the CDA. Cerebral Cortex.


Publications, Presentations, Proceedings & Patents


Peterson, M.S. (August 2010). Using Eye Tracking to assess users' attention and information processing: The dos and The don'ts Joint Human Factors & Ergonomics Society-Potomac Chapter / Usability Professionals-DC meeting, Bethesda, MD.

Peterson, M.S., & Wong, J.H. (May 2011). Spatial memory increases fixations to targets and onsets in a visual search task. 11th Annual Meeting of the Vision Sciences Society, Naples, FL.


Patents


Arch Lab Awardees

Haneen Saqer – 2011 Kevin Corker HFAC Outstanding Student Award

Yi-Fang Tsai - 2011 GMU CHSS Dissertation Completion Award
**Announcements**

**Journal Club Announcements**

NEW! The Human Factors Journal Club has now begun and has had several successful meetings. Through the summer, the club will be meeting on Wednesdays in the Arch Lab at noon. All are welcome to attend!

The Cognitive Neuroscience Journal Club is meeting on Thursdays throughout the summer. You can check meeting dates/times as well as topics on the website: [http://archlab.gmu.edu/CogNeuroJournalClub/](http://archlab.gmu.edu/CogNeuroJournalClub/)

**Important Dates**

Save the date! Psychology Department Graduate Student Orientation: The Psychology Department Graduate Student Orientation will be held on Thursday, August 25th. This event is generally an all-day affair (including lunch) so please please keep this day open on your calendar. All newly admitted and returning students, faculty and staff are invited. Once the schedule is finalized, more information will be provided.

Save the date for HFES 2011 which will be held in Las Vegas, Nevada. Registration is now open and the reserved hotel block is 40% booked. - so make your plans early! You can check the meeting page for details ([http://www.hfes.org/web/HFESMeetings/2011annualmeeting.html](http://www.hfes.org/web/HFESMeetings/2011annualmeeting.html)).
Your contributions help us continue to improve the Psychology program at George Mason University. If you would like to make a financial contribution, visit http://supportingmason.gmu.edu. Be sure to specify either Psychology Department or Psychology Scholarships! Thank you for your generosity.

For information about Alumni Affairs go to: http://www.gmu.edu/alumni. Be sure to keep your information up to date.