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HFES Student Executive Council

Nicole Werner President
Bridget Lewis Vice President
Stephanie Pratt Treasurer
Christian Gonzalez Secretary
Dan Roberts Webmaster
Dan Gartenberg Newsletter Editor
Ross Thornton CHI President
Allison Sleeman Social Coordinator
Greetings From the HFES Student Council President

Greetings Arch Lab members and supporters!

On behalf of the entire Human Factors and Ergonomics Society (HFES) student group executive council I wish to extend a warm welcome back, as well as an enthusiastic hello, to the six new doctoral students & 16 new masters students. On that same note, we are excited to welcome our new faculty member, Dr. Robert Youmans. For more information on Dr. Youmans, check out his interview with Stephanie Pratt on page nine.

This has been an exciting year so far for the HFES student group as we have worked hard to bring several successful events to the students and faculty, including a user-experience career talk, tours of the Pentagon and MITRE, as well as a website building night co-hosted by the CHI student group. In our outreach activities we represented the Arch Lab and the Distractions n’ Driving team at the DoD Human Factors Engineering Technical Advisory Group mixer, and we are working with the HFES national organization to design and staff a booth at the U.S. Science and Engineering festival this spring. Be on the lookout for the HFAC Survival Guide which the student group produced as a resource for new students about how to live and thrive at GMU and the Fairfax/DC metro area. This guide will be published for the Arch Lab library and will be available electronically with an interactive google map of all the locations mentioned in the guide. Another success for the semester was the design of the Arch Lab t-shirts and sweatshirts. Hopefully you were able to pick up your new limited edition Arch Lab fashions, designed by student chapter Vice President Bridget Lewis. These were a success! It has been wonderful to see so many wearing them around the lab.

We will continue our efforts in the spring with the annual alumni career panel and the annual ski retreat. Additionally, following in the footsteps of the HFES national organization, we are developing a webinar symposium series, set for March, with the University of Central Florida HFES student chapter. Also in the spring, the HFES Potomac Chapter will visit the Arch Lab for a lab tour and dinner. We look forward to that exciting event as well as continued collaboration with the Potomac Chapter at the U.S. Science and Engineering Festival in April.

I welcome any comments or suggestions you may have regarding the student chapter. Thank you to my predecessor, Haneen Saqer. Finally, none of these events would be possible without the hard work and dedication of the hardworking executive council members: Bridget Lewis, Stephanie Pratt, Christian Gonzalez, Allie Sleeman, Dan Gartenberg, Ross Thornton. Thank you for making this semester such a success!

Semester Highlights

DoD TAG mixer.

Barbecue at Deborah Boehm-Davis’ house.
John suiting up after an interesting brownbag.

HFES student group receives the Gold Award for the 2010 year.

New Student Corner
The Arch Lab Welcomes the New Students of 2011!

Eric Blumberg
- Ph.D.
- Undergrad: North Carolina State University
- Working with Dr. Matt Peterson
- Interested in attention, adaptive automation, situational awareness, and cognitive aging

William Ryan McGarry
- Ph.D. Student
- Undergrad: George Mason University
- Working with Dr. Pam Greenwood, Dr. Jim Thompson, and Dr. Raja Parasuraman
- Interests in interactions between visual attention and aging; sleep; and the use of MRI in studying cognition and aging
New Student Corner
The Arch Lab Welcomes the New Students of 2011!

Nick Penaranda
- Ph.D. Student
- Undergrad: George Mason University
- Working with Dr. Caryl Baldwin
- Interested in adaptive neural networks, real time workload using physiological measures, programming

Raul Ramirez
- Ph.D. Student
- Undergrad: University of Alabama
- Working with Dr. Tyler Shaw
- Interested in vigilance, workload transitions, transcranial doppler sonography

Kelly Satterfield
- Ph.D. Student
- Undergrad: University of Dayton, Dayton, OH
- Working with Dr. Tyler Shaw
- Interested in vigilance and mental workload transitions using transcranial doppler sonograph

Melissa Smith
- Ph.D. Student
- Undergrad: University of Central Florida
- Working with Dr. Matthew Peterson
- Interested in eye movements and cognition, human-robot/human-computer interaction, medical human factors, and situation awareness
New Student Corner
The Arch Lab Welcomes the New Students of 2011!

Brooke Bellows
• Masters Student
• Undergrad: State University of New York at Oneonta
• Working with Dr. Rob Youmans
• Interested in attention, decision making, usability

Jacob Bevitt
• Masters Student
• Undergrad: University of Illinois
• Working with Dr. Jim Thompson
• Interested in spatial navigation

Josh Brown
• Masters Student
• Undergrad: Bridgewater College
• Working with Dr. Carryl Baldwin
• Interested in statistics and user interface design

Chris Cooper
• Masters Student
• Undergrad: Rutgers University
• Working with Dr. Pamela Greenwood
• Interested in attention, boredom, vigilance
New Student Corner
The Arch Lab Welcomes the New Students of 2011!

Logan Glantz
• Masters Student
• Undergrad: Washington State University
• Working with Dr. Jim Thompson
• Interested in neuroimaging and fMRI

David Hawkins
• Masters Student
• Undergrad: University of California, Riverside
• Working with Dr. Jim Thompson
• Interested in vigilance, workload, spatial navigation

Devon Kelley
• Masters Student
• Undergrad: State University of New York College at Oneonta
• Working with Dr. Raja Parasuraman
• Research interests include: aviation, training, and working memory

Will King
• Masters Student
• Undergrad: Christopher Newport University
• Working with Dr. Raja Parasuraman
### New Student Corner
The Arch Lab Welcomes the New Students of 2011!

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Undergraduate School/University</th>
<th>Research/Professional Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Nash</td>
<td>Masters Student</td>
<td>University of Wisconsin - Eau Claire</td>
<td>Interested in adapting cognitive research techniques for usability/user experience research in a professional setting</td>
</tr>
<tr>
<td>Cynthia Nguyen</td>
<td>Masters Student</td>
<td>University of Texas at Austin</td>
<td>My research interests include mental workload, personality, usability, and decision making</td>
</tr>
<tr>
<td>Ryan Olmstead</td>
<td>Masters Student</td>
<td>Texas Tech University</td>
<td>Interested in adaptive automation, training</td>
</tr>
<tr>
<td>John Payne</td>
<td>Masters Student</td>
<td>University of Illinois Urbana-Champaign</td>
<td>Interested in attention, awareness, visual (cognition, awareness, attentional/inattentional blindness), spatial navigation</td>
</tr>
</tbody>
</table>
Brittany Sarbone
- Masters Student
- Undergrad: University of Maryland
- Working with Dr. Pam Greenwood and Dr. Raja Parasuraman
- Interested in the neurological and cognitive aspects of human factors, particularly perception using feature saliency and visual design. I have a strong interest in neuroergonomics, the neurological components of perception and how to apply these concepts to product design.

Savannah Sleicher
- Masters Student
- Undergrad: State University of New York College at Oneonta.
- Interested in medicine and procedural safety. Currently working at Children’s National Hospital in DC in the legal department working on Risk Assessment.

Lisa Smith
- Masters Student
- Undergrad: BS in Communication from Old Dominion
- MFA in Creative Writing from George Mason, Master of Aeronautical Science with concentrations in Aviation Human Factors and Aviation Systems Safety from Embry-Riddle
- Interested in augmented cognition and aviation human factors, especially with human-helicopter systems.

Hyun Woo
- Masters Student
- Undergrad: University of Illinois at Urbana Champaign
- Working with Dr. Chung Hun Lee at CEHD as a GRA, and with Dr. Tyler Shaw
- Interest in automation, human-computer interaction, and mental workload.
Welcome New Faculty, Dr. Robert J. Youmans!

By Stephanie Pratt

Could you tell us a little about yourself?

I grew up in Raleigh, NC, and I went to NC State University for Mechanical Engineering. After three years I decided I didn’t want to be an engineer because the job seemed so dull, but I was not at all sure what else I wanted to do. I was taking child development courses that I found fascinating, and I decided to switch to psychology as a major. But then, as graduation approached, I decided that I didn’t want to do anything with academics and instead packed up all my belongings into a backpack and moved to Paris. Eventually, I used up all my money that I had saved, and so I was forced to search for a job someplace. I interviewed at a company in Paris that did media relations, and they offered me a job, but in London, not Paris. I was so desperate for some cash that when I moved to London, I actually got a second job as a bartender, and I lived entirely off my tips for a month eating nothing but day-old pita bread and cheese until I got my first real paycheck. The firm that hired me was a Public Relations firm, and to me, it was a lot like the show Mad Men. I wore a suit to work every day, and my job was to read newspapers to see if any of our clients were mentioned, ghost write articles for clients, and entertain potential and current clients. I learned a great deal working there the ghost writing was perhaps the most interesting. I wrote for Maryam Schwartz, a Dutch government Minister whose office encouraged other nations to invest in the Netherlands. Anyway, after about 6 months of this, I moved back to the United States to pursue a higher degree, but I was still not 100% sure what I wanted to pursue. I ended up applying to both law schools and psychology programs and was accepted to both. I remember my father getting really angry when I passed up a scholarship offer to a strong law program and decided to go to Wake Forest University for their Master’s program in Experimental Psychology. Wake was a great program, and I was lucky to work with Eric Stone, who studied decision making. I wrote my thesis on how feedback can change decision making, and it was really then that I started seeing the connections between cognitive psychology, decision making, and human factors. After Wake, I moved to Chicago to work with Stellan Ohlsson at the University of Illinois, Chicago. While there, I completed a minor in Industrial Design, and wrote my dissertation on the protective effects that prototyping has in preventing design fixation. When I graduated, I was lucky to have several offers related to applied psychology, and I accepted a position at California State University, Northridge. I worked there for 4 years before coming to GMU.

Why did you choose to come to GMU?

I really wanted to be in a place where the psychology and human factors research was strong. I had met some people from GMU here and there, and I had read papers from people who were working here, which increased my interest. It sounds sort of strange to say it, but I really want to be at a place where interesting and intelligent people who work hard surround me. Also, the program here at GMU seemed young and innovative enough to support both my applied interests and my research interests in creativity. I actually did not get an interview the first time I applied to GMU in 2010, but I was so sure that I wanted to come to GMU that I applied twice!

Could you tell us a unique fact about yourself?

I built a convertible racecar in graduate school – a modified replica of a 1964 Shelby Cobra. It’s the same basic car that they built in 1964, but with some safety and user-interface modifications. My Dad is really into cars, and I love mechanics and design, so we did it together. There is plenty of human factors psychology involved in building a car from scratch – for example,
Interview with Dr. Youmans Continued

I designed the layout of the cockpit. It took me 6 years to complete the car, and it is legal to drive on the road, so maybe I’ll bring it up to GMU eventually. The car is extremely challenging to drive, so last summer my Dad and I went to a racing school in Arizona for a few days, but any student who rides with me will have to sign a waiver or something…the car is fast.

You have done some industry consulting. How does that impact your research interests?

It is very interesting to see how someone in industry approaches problems – they want solutions to problems, but they don’t always care about why they are happening. One thing I’ve tried to do at the companies that I’ve worked with is to explain to them that it can be good for them to understand why a problem is happening because the ‘why’ can give you clues about how to solve the problem. That’s a pattern that has influenced some of my research – starting by spotting an obvious problem that might be addressed by human factors, then investigating that problem to figure out why it might be happening. Other than that, I would just say that I have been really surprised at how interested many people who work in industry have been in my work. For example, they will read my papers and email me; graduate students almost never do that. One time a company even hired me to conduct a literature search. It’s a good experience for me because it reminds me of the business side, and for students, industry provides me with a lot of good examples that I use as teaching tools. And of course, industry experience is very valuable for providing guidance to students who want to ultimately go into business themselves.

What is one piece of advice you would give to current graduate students?

I think three things are crucial for succeeding in graduate studies:

1. Work Really Hard
2. Be positive and have a sense of humor
3. Be curious – explore other areas outside of your field

I’d like to elaborate a bit about point 1. At each stage of my training and work experience (undergrad, industry, masters, Ph.D., faculty) I have often believed that I was working extremely hard…maybe harder than everyone else around me. And yet, as I’ve advanced, I’ve realized that I was actually not that special – and that I was not actually working any harder than any of the other successful people in that area. This is especially confusing for me in graduate studies because I thought (falsely) that every one of my peers would go on to faculty careers in psychology. But if you look at the number of faculty jobs that GMU advertised in the past few years, and then compare that figure with the number of PhD’s that GMU has graduated, you can see how wonky that assumption was. The truth is that someone who is extremely successful in any given field typically works MUCH harder than other people realize. In fact, in my experience, the number one predictor of how well people will do ANYTHING is how much time and energy they put into doing it. So based on my observations, my advice to graduate students is to think very carefully about how many good jobs there are in the area that they want to be in (industry or academic or government or clown college…it makes no difference), because there are only so many good jobs. Next, you really ought to think very deeply about what you love doing, because I honestly think that the chances that you will succeed at getting a job go down drastically when there is a mismatch between what you love and what you are doing. And I think the chances go down because people underestimate the amount of work that it really takes to achieve in that profession. Say what you will about individual differences….if you read Erickson it is clear that if you really want to achieve expertise in academics or any other profession, you are not simply born with some special ability that makes you great. Greatness takes work…maybe more than a person is willing to give unless they love what they are doing…and that is, in my opinion, some good advice for graduate students to consider.
Transcranial direct current stimulation (tDCS) is a technique that has been shown to improve cognitive performance by applying weak electrical currents to cortical regions of the brain. Anodal (positive current) stimulation has been used to facilitate cognitive functioning, while cathodal (negative current) stimulation has been shown to cause inhibitory effects. A CENTEC sponsored study recently completed by Brian Falcone and Dr. Raja Parasuraman investigated the effects of tDCS on learning to perform a threat detection task. This research is a collaboration with Dr. Vince Clark of the University of New Mexico.

The study is an extension of a previous experiment conducted by Dr. Clark and colleagues (NeuroImage, 2012), where they found that anodal stimulation of the right inferior frontal cortex can enhance learning of threat detection. In addition to showing similar results using the same paradigm, we also found that the effects were retained 24 hours later. Participants who received 2mA stimulation during training were able to achieve higher levels of accuracy when tested immediately afterwards and again 24 hours later, than those in the control group who received sham stimulation (.1mA). The threat detection task required the participants to identify discrete threats within static images taken from a virtual environment.

The success of tDCS as a cognitive enhancement technique has led us to design several follow up studies. A proposal for one such study was recently submitted and subsequently awarded $500 from the Augmented Cognition Technical Group (ACTG) at this year’s Human Factors and Ergonomics Society conference to help fund the project. Our objective for this study is, not only to give further evidence for a hemispherical dissociation between verbal and spatial working memory, but to also show improved performances on a verbal working memory task while applying anodal stimulation to the left DLPFC, and improved performances on a spatial working memory task while applying anodal stimulation to the right DLPFC.

TDCS is an inexpensive and useful tool for both enhancing cognitive performance and shining new light on the functions of various cortical areas. Despite its recent growing popularity, it is actually not a new technology. In fact, tDCS has been around for over 100 years and has been revived on more than one occasion for various applications. In areas related to psychology, it was first used as a means to treat depression only to be replaced by electroshock therapy. Decades later in the 1960’s, it was revived again for various other therapy treatments, only to be replaced this time by drug therapy. Now that it is back again, and with better equipment and methods, modern research is continuing to show that tDCS is very effective and has more applications than ever thought before. Let’s hope that it sticks around this time.
A small group of GMU graduate students supervised by Dr. Matt Peterson, in conjunction with the U.S. Army’s Night Vision and Electronic Sensors Directorate (NVESD), recently completed Android and iPhone versions of the Army’s ROC-V desktop software.

ROC-V, which stands for Recognition of Combat Vehicles, is a suite of classroom-based software created to facilitate and standardize vehicle identification training for military personnel. Though ROC-V has been used effectively by the Army, it has limited usefulness in the field where ROC-V capable computers may be inaccessible. Recognizing this limitation as well as the fact that a vast majority of soldiers own mobile devices, NVESD asked Dr. Peterson if he could adapt ROC-V to mobile devices.

By mid-July, development on “Portable ROC-V”—as it was called then—was officially underway. HFAC Ph.D. student Dan Gartenberg and George Mason computer scientist Dustin Pfannenstiel set out on the iPhone version while Nick Penaranda, also an HFAC Ph.D. student, began working on the Android version. In less than four months, Dr. Peterson’s team built completely separate but parallel apps for the two leading smartphone platforms and delivered it to the Army team for dissemination.

“I wanted to make something easy-to-use and aesthetically pleasing,” says Dan Gartenberg. The team met frequently to test and discuss new features, incorporating miniature usability studies in each meeting. “Everyone was constantly testing on emulators and their own devices. I think it was because of this that we were able to create such a solid product.”

ROC-V Mobile v1.0 for both Android and iPhone contains several hundred high-quality images of 86 tracked, wheeled and rotary vehicles (helicopters) in a searchable and expandable database; identification “cues” such as armament and other salient features for each vehicle; a comprehensive primer on vehicle identification principles; customizable identification “challenges” to test one’s knowledge; and persistent performance tracking.

ROC-V Mobile has been delivered, but the team believes this is only the beginning. Currently, the app is only available to military personnel for testing purposes. However, John O’Connor, lead for the Army team, recently showcased the application at the I/ITSEC conference; and feedback on the application was extremely positive. The team already has a long list of features planned for the next version of ROC-V.
Designs We Love to Love and Love to Hate

By Bidget Lewis

**What is it:** The doors at the Red Rock Hotel, where the 2011 HFES Conference was held this year.

**Why we hate it:** The doors, while aesthetically pleasing offered no indication as to which way they opened. It was not uncommon to run into a door you expected to push or pull on a door that wouldn’t budge.

**What is it:** The shower door/towel racks at the Red Rock Hotel

**Why we hate it:** The direction in which the door opened made it impossible to reach your towel without actually stepping out of the shower, causing you to drip everywhere.

**What is it:** Water fountains around George Mason

**Why we hate it:** The placement of the push button to make the water flow makes it extremely hard to both initiate water flow and drink at the same time.

**What is it:** A “Clean Bottle” water bottle

**Why we love it:** It has a screw off bottom and top for easier cleaning.
What is it: Pull out freezer drawers

Why we hate it: In order to open a drawer the door must be all the way open, meaning that it takes more than one step to put anything in or take anything out of the freezer.

What is it: Slotted overflow drain

Why we love it: The higher drain allows for a 2-3 inch rise in water level without having to make the edges of the tub too much higher.

What is it: Extended table.

Why we hate it: The table leads you to believe that it can support things on its wings, however it cannot actually take much weight at all, causing it to collapse unexpectedly, spilling anything on it to the floor.

What is it: Apple xcode 4

Why we hate it: Upgrading to xcode 4 (compared to versions 1 through 3) involves changing to a completely new interface requiring users to learn operations completely from scratch.
This year the 55th annual meeting of the Human Factors and Ergonomic Society was held under the expansive blue skies of Las Vegas. The Red Rock Hotel provided beautiful off-strip facilities overlooking the desert and surrounding distinctly-colored mountains that earned the hotel its name. Six Faculty and 31 students were in attendance including a strong showing from the incoming class of 2011. This year the student group was able to fund 10 students with many more receiving assistance from the Graduate Student Travel Fund. Though several students attempted to fund themselves via the tables and slot machines, few, if any, were successful.

The HFES career center provided attendees with opportunities not just to apply for positions and internships, but also to interview. Several students from George Mason were able to interview with companies like Aptima, Microsoft and Honeywell.

Once again the Arch Lab had a notable presence at the conference with over 15 panelists, talks and poster presentations. Our newest faculty member, Rob Youmans, gave an interesting talk on task-switching ability during the Individual Differences session based on research conducted at California State University Northridge.

In keeping with HFES tradition, we hosted a hugely successful alumni dinner with over 40 alum and friends of George Mason in attendance. New students were provided with a unique opportunity to network with graduates working in all aspects of academia and industry.

The student group also had the opportunity to meet with the University of Central Florida chapter and discuss possible online mini-symposium between the two institutions. This collaboration, likely to take place in the spring semester, would provide students from both universities the opportunity to present and give feedback on a wide variety of research projects.

A little colder, but a little closer to home, hopefully next year’s meeting in Boston will be as successful and rewarding. Hope to see you all there!
Publications


Clarke, E., Greenwood, P.M., Parasuraman, R. (May 2011). Visuospatial attention differences during the retention phase and aging differences. Poster presentation for APS research conference


Tsai, Y. D., & Peterson, M. S. (June 2011). The effects of route guidance on spatial learning. 6th Annual Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design (Driving Assessment), Lake Tahoe, CA.


De Visser, E. American Psychological Association Dissertation Research Award ($1000), 2011.


Falcone, B. $500 grant from the Augmented Cognition Technical Group, 2011.


Garcia, A. Air Force Research Laboratory 711th Human Performance Wing Human Effectiveness Directorate Repperger Summer Research Fellowship, Summer 2011.
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.