



Student Newsletter

From the Education Technical Group (ETG)

STEM Outreach Edition

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From the Editor

By Michael Rupp, Ph.D.



Hello everyone. Thank you for reading our HFES Student Newsletter. We hope you enjoy reading this newsletter and that it functions as a helpful resource for students. Please let Brittany (my co-editor) and I know if there are any topics you would like included in a future issue or if you want to contribute to a future issue.

In this edition, we wanted to shine a light on ways to get involved, reach out, and share your knowledge of science and HF/E with others. Today, it is more important than ever to get involved with your local institutions and the larger community as a whole. This might include talking to and engaging students in other disciplines, giving presentations to others about what HF/E means, judging science fairs, hosting STEM/science outreach events, volunteering in the community, and participating in interdisciplinary work. I think human factors is the perfect discipline for this task. We work on so many facets of psychology, engineering, computer science, neuroscience and others. We work to improve the lives of people by ensuring our technology is safe, usable, and trustworthy; we reach for the stars; we work to develop ways to improve performance, develop computer simulations, autonomous robots and more. How could that not be interesting and inspiring to others?

In this edition, we recently had a chance to interview Dr. Haydee Cuevas, who has previously been awarded for her outreach efforts. So, do not only take my words for it – read her tips on science communication, and think about what you can do to make a difference. Next, we were able to highlight a couple of the finalists for best student paper at last year's meeting. Finally, we end this issue by highlighting the Georgia Tech HFES Student Chapter (HFES-GT). This article also provides tips for how this chapter is already working to get involved with their community.

Important Dates

- **Call for Student Volunteers for the HFES Annual Meeting**
 - <https://www.hfes.org/Security/ContentPages/?Id=2746#Volunteers>
- **Apply for student travel awards for HFES meeting, closes: **May 15, 2018****
 - <https://www.hfes.org/ContentCMS/ContentPages/?Id=9Q9kLyAV6r4=>
- **Register for the 2018 Annual Meeting, opens: **June 25, 2018****
 - <https://www.hfes.org/ContentCMS/ContentPages/?Id=h9XktKibSYQ=>
- **Submissions for HF Prize in Virtual/Mixed Reality, closes: **July 16, 2018****
 - <https://www.hfes.org/Security/ContentPages/?Id=2712>

HF/E Outreach Tips

By Haydee M. Cuevas



1. Can you briefly describe the work for which you were recognized?

I imagine this was primarily for my work with Ron Shapiro to establish National Ergonomics Month (NEM), a grassroots national-level initiative targeted at promoting awareness, understanding, and education of human factors and ergonomics (HF/E) through outreach at four fronts: media, government and corporate, school and community, and student. Since its inception in October 2003, NEM outreach activities by HFES members have reached over 22,000 people and over 7,000 students. I served as Co-Chair from 2003 to 2005 and as Chair from 2006 to 2008. This award also recognized my work as founder and organizer of the HFES Mentor-Mentee Luncheons. A series of mentoring sessions for students and early career professionals are held each year at the HFES Annual Meeting. Established in 2005, this event has provided mentoring opportunities for almost 1,000 HFES members and has become an officially sponsored activity at the HFES Annual Meeting.

2. What tips or examples could you give for describing HF/E to the general public?

Keep your message simple. Avoid technical terms and discuss HF/E in layman's language. Use examples that are meaningful to your audience. When speaking to others, I

describe HF/E as the profession focused on facilitating the interaction between people and technology. Then I share examples related to what may be of interest to my audience, such as the design of cell phones, automation in vehicles, office furniture, etc.

3. What advice would you give students for getting others outside the field interested in HF/E or more generally in science?

Be passionate about what you do and instill this passion in others. When I speak to my students, I ask what excites them, what drives them, what keeps them up late at night. Then I relate their ideas back to how HF/E can solve these real-world problems. Again, avoid technical terms and discuss HF/E in layman's language.

4. How has your research or teaching changed since receiving this award?

Receiving this award has increased, even further, my commitment to student mentorship and HF/E outreach. HFES recently established the Mentorship Committee, for which I am currently serving as Co-Chair. This is a fantastic opportunity to connect individuals both internal and external to HFES and organize activities of the Society's various groups, such as the Leadership Development Committee, HF/E Women's Organization for Mentoring and Networking (HFE WOMAN), Diversity Committee, Early Career Professionals Committee, and so on, toward achieving a common goal.

5. Do you have any additional thoughts regarding the topic of engaging our youth and people across different industries in HF/E?

Find your passion and instill that passion in others. Relate your work and HF/E in ways that are meaningful to your audience. Finally, seek out mentorship opportunities, both as a mentor and as a mentee.

Research Corner

For this edition of the research corner, the ETG Student Newsletter wanted to highlight present award finalists and winners for the Alphonse Chapanis Best Student Paper Award. Congratulations to Robin Mickelson and Richard Holden for being the recipients of the 2017 award for their article titled *Capturing the Medication Management: Work System of Older Adults Using a Digital Diary Method* and Jessica Cruit, & Guy Cohen-Lazry for being finalists of this award.

Predicting General Aviation Pilots' Weather Performance through a Scenario-Based Assessment

By Jessica Cruit



Before I began my dissertation project, I spent several years studying aviation weather, decision-making, and psycho-measurement. I was able to work on various research projects with different faculty within my department with this specific research focus. Therefore, when it came time for me to choose a dissertation topic I wanted to study aviation weather and psycho-measurement in more depth. Fortunately, at the time I was choosing dissertation topics, I was currently working on an FAA sponsored

project that involved those focal points (i.e., aviation weather & assessment). Through reviewing the literature for our project, I found that none of the weather questions on the FAA Written Exam (the test that gives private pilots their flying certificate) tested students at the scenario level of measurement. What this means is that student pilots were only being tested at the rote level of knowledge, which really meant that they could memorize all the questions and answers from an online study guide and then see those questions word for word on their actual test. In any case, this is not the ideal situation. However, what you might not have known is that private pilots also have trouble understanding weather and weather technology. Previously this had led to pilots having a history of getting into fatal accidents during bad weather.

At this point it seemed pretty obvious what I needed to do for my dissertation: create a scenario-based assessment that assessed private pilots' weather knowledge and then compare the exam I designed to the original FAA Written Exam. The goal of my research was to determine which test better predicts pilots' weather performance. Long story short, the results of the study showed that a scenario-based assessment is a better predictor of performance over the traditional exam. I am currently expanding the study to include a more representative General Aviation (GA) pilot sample so that these assessment questions can be used on the FAA Written Exam in the future.

The Effects of Continuous Driving-Related Feedback on Drivers' Response to Automation Failures

By Guy Cohen-Lazry



During the last Human Factors and Ergonomics Society meeting, we presented a study conducted at the Human Performance Evaluation Lab in Ben-Gurion University of the Negev in Israel. The study evaluated the benefits of using continuous auditory feedback provided to a human

driver during Level-3 autonomous driving. Specifically, we wanted to know whether this type of feedback where we provide drivers with information regarding the traffic environment can improve drivers' awareness of their surroundings, resulting in improved control take-overs.

The motivation for this research is straight forward, as the issue of safely transferring the control from the autonomous vehicle to the human driver and vice versa is a critical safety issue, which attracts extensive attention from many human factors researchers worldwide. This growing attention in issues of autonomous driving in general, and specifically in transfer of control, has also been reflected in the last HFES meeting where a great deal of presentations dealt exactly with that issue. The vast interest in this problem is probably due to its relevance for the very near future of autonomous vehicles. As many automotive companies are currently developing vehicles equipped with Level-3 automation, with the intent of marketing them within four to five years, making sure these vehicles are safe is of great importance. Despite the rapid development process, the problem of drivers failing to regain proper manual control of their vehicles remains unsolved and presents many safety challenges for vehicle manufacturers.

Although many different researchers attempted to address this problem, we took a different approach inspired by a team-work concept previously used in aviation cockpits.

Multi-crew aircraft pilots are often engaged in tasks other than actually flying the aircraft. A captain may delegate the control of the aircraft to the co-pilot, while using the on-board flight management computer, or performing secondary tasks such as fuel calculations. Although there is always at least one crewmember in-charge of flying the aircraft, the captain (or any other non-flying pilot) is always expected to be ready to regain control. To assist non-flying pilots, fulfil this requirement, airlines have developed all kinds of protocols (often referred to as Standard Operating Procedures; SOP) to assist crewmembers who are engaged in secondary tasks, in maintaining their awareness of the aircraft's environment and of the current situation. One typical SOP is for the operating crewmember who is actively flying the aircraft to verbally call-out his or her actions while performing them (e.g., "climbing to altitude 27,000 feet", "increasing speed to 310 knots"). These utterances are very useful in keeping the non-flying crew-member aware of the aircraft's situation.

In our study, we implemented a similar protocol. The vehicle reported its actions and important information about the environment. Although we expected this protocol would make drivers more aware of their surroundings, the results were ambiguous. Continuous feedback led to significantly more on-road glances. However, this increase in on-road glances, did not translate into an improvement in drivers' reactions to a simulated take-over event. Specifically, drivers' reaction times (both for braking and for steering) were similar to drivers who did not use the continuous feedback. These conflicting results served as a basis for a following study. Ultimately, we hope that the results of this study among others will provide a solid ground to help manufacturers decide which methods are preferable for implementation in the design of interfaces for Level-3 autonomous vehicles (and which are not).

Student Chapter Spotlight: Georgia Tech

By Angela Yoo



Georgia Tech's student chapter of Human Factors and Ergonomics Society brings together graduate students in engineering psychology, as well as students from a range of fields from human-computer interaction and industrial design to engineering and business. The chapter's roots in engineering psychology has provided it with a strong foundation thanks to the guidance of the faculty advisors, Dr. Wendy Rogers and Dr. Frank Durso, and continued by Dr. Jamie Gorman. With their support, the chapter has a core set activities that include outreach events in the community, applied projects, socials, and industry speakers.

Every year, HFES-GT members attend Fernbank Natural History Museum's "Adventures in Science Day" to interact with children and families and teach them about human factors. To broaden the impact for both young and old, the student chapter facilitates activities such as the "Space Race: Aliens versus Humans" building block activity, bad design identification photos, and driving simulators. Outreach efforts have also included participating in the Atlanta Science Festival every spring, where the chapter has had support and additional volunteers from the Clemson University HFES student chapter. Another key area for the chapter members has been applied projects because practical applications offer opportunities for professional development and portfolio building. Recent projects include evaluating web tools for collaboration, proposing a web-based voting process for the HFES "Voting System of Tomorrow" competition, and developing surveys and focus groups for the Georgia Tech Office of the Arts. The Center for Disease Control, based in Atlanta, has even approached the chapter to help revise the vaccination schedule chart used by clinicians. A team of student worked with Dr. David Kim to improve the legibility, readability, and clarity of the vaccination schedule by using design principles.

Beyond outreach and projects, the chapter also hosts social events a couple times a year, which contribute to the cohesion and camaraderie of fellow students. Many of the social events typically involve meeting at nearby restaurants for food and conversation. However, at least once a year the chapter enjoys a more adventurous outing such as an escape room, Top Golf, laser tag, and picnics. This past year, the chapter invited other human factors-relevant student organizations to a Legos and design thinking workshop at the Museum of Design Atlanta to foster partnerships on campus and promote recruitment. At least once a year, the chapter has the privilege of having an alumnus of the program visit and present at a chapter meeting. The school benefits from a strong network of alumni who are willing to return to Georgia Tech to share their experiences and support the current students. Recently featured alumni include Tim Nichols from Microsoft and Philart Jeon from Michigan Tech. The support that the chapter receives from these alumni, faculty advisors, and many others is essential to the continued improvement and growth of the chapter and enables the student members to support the field through outreach and professional development. For more information please visit: <http://hfes.gatech.edu/>

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