NIOSH Occupational Safety and Health Training Program Renewed

The University at Buffalo offers a 2-year Master’s level training program in occupational safety and health (OSH). Now in its 9th year, the program has graduated more than 20 students who are active members of the OSH community. Students from Industrial and Systems Engineering who participate in the program receive a high quality, multidisciplinary education from multiple university departments, participate in safety-related research, and receive applied practice through an internship experience and OSHA certificate training.

Trainees complete courses in safety, ergonomics, industrial hygiene, and epidemiology within the human factors and ergonomics concentration. The program involves a mentored thesis project and an internship at a cooperation with the Niagara Frontier Chapter of the ASSE. Throughout the program, trainees are encouraged to engage with safety professionals at local, regional, and national meetings. After completing this program, trainees will enter the OSH profession prepared to meet industry needs and become leaders in the field.

The NIOSH grant provides funding for selected students. Interested students are encouraged to email Dr. Victor Paquet (vpaquet@buffalo.edu) or Dr. Lora Cavuoto (loracavu@buffalo.edu).
The UB HFES student chapter excited to be heading into another academic year, and our members are excited to take part in events both familiar and new! The club participated in the traditional First Friday trip to the Albright-Knox Art Gallery and welcome event for new students, located in the Elmwood Village area. This November, members of the chapter will be heading to the University of Toronto for the 16th annual Inter-University Workshop in November. This workshop showcases student research in human factors and ergonomics, allowing participants to share knowledge with their peers and practice conference-style presentations in a low pressure environment. The University at Buffalo hosted the event last fall and, with many engaging student presentations from universities throughout the region, we are looking forward to another exciting workshop at Toronto.

The club is also looking forward to October’s National Ergonomics Month and will be hosting a campus-wide “Bad Design Contest.” All students are invited to participate by tweeting a picture and explanation of a terrible user design found on campus to the club’s Twitter account, @ubHFES. Prizes will be awarded for the top three submissions, and links to useful human factors and ergonomics resources will be posted on the student chapter’s Twitter and Facebook pages.

Finally, the club is pleased to announce that the HFES National office has awarded UB HFES their “gold” chapter status! This identifies our chapter as one of a few that demonstrates excellence in a number of different categories and activities, including service to HFES, outreach and volunteerism, mentorship, and continuous improvement, among others. With the academic year before us, the chapter is excited to maintain its service to the organization and wishes our members the best!

**Current UB HFES Officers**

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Rebecca Berg, Treasurer
Formally Modeling Erroneous Human Behavior

Failures in complex systems often occur because the people using them make errors unanticipated by designers. There are different ways of modeling human error that help engineers understand why and how errors occurred so that systems can be designed to be resilient to them. Existing models tend to classify human error based on either the psychological reasons that errors are performed or how the errors manifest as unplanned actions. Dr. Matthew Bolton was recently awarded a grant from the Army Research Office to develop a new human error modeling system based on where in a human plan of actions the person deviates. It is hypothesized that this approach will be able to encapsulate the information contained in the other leading human error classifications and resolve inconsistencies between them. Dr. Bolton and his graduate students plan to describe our model mathematically and use logical and mathematical proofs to show this. Once completed, this model will be used to generate human errors in automated mathematical proof analyses. Engineers will be able to use these analyses to discover how human error could cause a system to fail and take corrective actions. This new analysis capability will be evaluated using a series of army case studies. It is their hope that this work will give engineers an unprecedented ability to understand human error and account for it in the design of safety critical system. While they will be applying their approach to army systems, the work is generalizable and will thus have applications in medicine, aviation, the military, and other safety critical domains.

RESEARCH HIGHLIGHTS

Advancing Safety Surveillance
Dr. Lora Cavuoto, in collaboration with Dr. Fadel Megahed from Auburn University, was recently awarded a three-year project from the American Society of Safety Engineers Foundation. The goal of the study is to develop a sensor-based exposure assessment system for the detection of fatigue, through real-time data collection and analysis of physical and physiological risk factors, for the prescription of appropriate in situ intervention. This system will allow for detection of at-risk individuals based on identification of fatigue and behavior deviations to enable intervention prior to injury.

Predicting Human Error
Prediction of human error before it occurs is one of the most challenging topics in human factors engineering research. Supported by NSF, this project led by Dr. Sean Wu studies the applications of data mining techniques in early detection of numerical typing errors by human operators through quantitative analysis of multichannel electroencephalogram (EEG) recordings. Three feature extraction techniques were developed to capture temporal, morphological, and time-frequency (wavelet) characteristics of EEG data. Based on the current results, it is possible to predict erroneous keystrokes a few hundred milliseconds prior to error occurrence. This research transforms human error research work from traditional post-hoc analysis to real-time prediction of its occurrence with potential applications of intelligent human error prevention systems.
Michael Jenkins, Ph.D.

Michael Jenkins is a Scientist at Charles River Analytics (www.cra.com) located in Cambridge, MA – a small business that funded some of the research that helped support Michael’s Ph.D. studies at UB. At Charles River, Michael is the Principal Investigator (PI) leading a number of exciting efforts. For example, he is currently leading a Phase I SBIR effort funded by the Department of Transportation (DOT) Federal Highway Administration (FWHA), which is applying Ecological Interface Design (EID) principles to create a novel display symbology to alert motorcyclists of upcoming roadway hazards through an augmented reality (AR) helmet display. He is also the PI on a 24-month US Army Aeromedical Research Laboratory (USAARL) effort selected for award that is applying virtual reality (VR) displays and body tracking sensors to bring traditional clinical evaluation procedures to the front lines for our Warfighters, with the goal of assessing their fitness to return to duty following a potentially concussive event (i.e., Traumatic Brain Injury (TBI)) or barotrauma. Also to Michael’s delight, he will be kicking off a new effort sponsored by the Army Research Lab (ARL) to create a human interface solution to enable Warfighters to more naturally and immersively interact with virtual, augmented, and fused reality training simulations. Michael is also keeping his ties to UB alive through a proposal recently selected for award where he will be collaborating with his UB advisor, Dr. Amy Bisantz, to execute empirical research to establish behavioral cues that can be used to help identify Warfighters at risk of engaging in risky behaviors and decision making.

Michael graduated from UB’s Human Factors Engineering program with his Ph.D. in 2013. His dissertation research focused on the design and empirical evaluation of network visualizations to support human sensemaking performance within the counterinsurgency (COIN) intelligence analysis domain.

Recent HF Ph.D. Dissertations


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Are you a UB HF Alum?
We’d love to hear your news.
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You can follow updates on your classmates at www.ise.buffalo.edu