A New Instrumented Vehicle in the Cognitive System Lab

A minivan as an instrumented vehicle has been purchased by the Cognitive System Lab directed by Dr. Changxu (Sean) Wu. This minivan is instrumented with on-board systems which are able to record vehicle performance characteristics such as speed, acceleration and distance, and other driver behavior (e.g., throttle/brake pedal angle, the frequency of speedometer inspection, etc.).

Dr. Wu is collaborating with faculty at Computer Science and Engineering and Civil Structural and Environmental Engineering in a NSF funded project revealing relationships and influences between human factors and vehicle network optimization. In this project, a driver assistant system will be designed and implemented. In the future, more experiments focusing on transportation safety and intelligent transportation system design will be conducted with this instrumented vehicle. For more information contact Sean Wu at seanwu@buffalo.edu

Recent HF Publications


ISE Students among Grand Prize Winners in GE HealthQuest Challenge

A team of Industrial Engineering graduate students from the University at Buffalo won $25,000 for designing a mobile medical app that aims to improve the discharge experience, enhance the coordination and collaboration of all stakeholders, and ensure continuity of care with community based care providers.

The students took part in a contest, sponsored by GE Healthcare in partnership with Oschner Health System, which asked participants to develop an app that improved patient and family experiences during hospital visits.

The team focused on the discharge experience as hospital readmissions, specifically those that occur within 30 days of an initial discharge, place a significant financial burden on healthcare systems and cause undue stress and anxiety on all participants.

The Discharge Roadmap app was designed to improve outcomes associated with the discharge planning process. It provides tailored content for each of the main stakeholders, the patient, the family caregivers, and the hospital based clinicians, to ensure that the best post hospital care decisions are made. Using the discharge roadmap app patients and their caregivers are placed at the center of the discharge process, enabling an open dialogue between all stakeholders regarding diagnoses, long term care needs, and post-discharge care preferences.

Through their tailored content, patients and their caregivers are provided a convenient and stress free way to learn about the patient’s diagnoses. Teach back modules, which provide the opportunity to assess understanding of the education materials, are also included.

Stakeholders are also provided the opportunity to independently assess the patient’s ability to manage their post-discharge care needs, allowing discharge planning discussions to be focused on finding solutions to the unsettled issues, rather than on repeating resolved issues.

Once ready for discharge, the app can send detailed referrals to community based care providers thus ensuring effective continuity of care upon discharge.
ASSE Fellowship Awarded to Study Physiological Effects of Obesity

Assistant Professor Lora Cuvuto spent six weeks this summer at the Liberty Mutual Research Institute for Safety in Hopkinton, MA investigating the effects of obesity on central and peripheral (cardiovascular and muscular) responses during exhausting physical work. Characterizing the effects of obesity on work capacity, performance and injury risk is of national concern due to the doubling in the prevalence of obesity over the past 30 years. Obesity is connected to an increased incidence of workplace injuries as well as more lost workdays, higher medical costs, and changes in worker productivity. For physically demanding work, such as lifting, it is unclear whether there are obesity-related impairments and if any impairment is due to worker tolerance or physical limitation of the cardiovascular system or muscles.

In order to test this effect, Dr. Cuvuto and Dr. Rammohan Maikala developed an incremental lifting task that fatigued participants close to their capacity to observe how the body and brain respond near exhaustion. Near-infrared spectroscopy was used to record blood flow to the brain and metabolic response monitored cardiopulmonary output. Data analysis and interpretation is ongoing. Outcomes of this project will enhance our understanding of the impact of obesity on a worker's physiological ability and the knowledge gained can allow for the design of interventions to reduce excessive exposures to physical risk factors.

To complete this project, Dr. Cuvuto teamed up with Research Scientist Rammohan Maikala, PhD as part of the American Society of Safety Engineers / Liberty Mutual Safety Research Fellowship Program. For more information, contact Lora Cuvuto at loracuvu@buffalo.edu.

Research to Improve Emergency Department Information Technology

UB Human Factors researchers are conducting immersive, simulation based testing of novel information displays to support individual patient tracking and overall system assessment in emergency medicine. The UB team, including faculty Ann Bisantz and Li Lin, and PhD students Theresa Guarerra, Nicolette McGeorge, David Lavergne, Sabrina Cacussi and Longshen Sun are collaborating with physicians and researchers at the National Center for Human Factors in Health Care, in Washington, DC, the University of Florida, and Virginia Commonwealth University. The study, funded by AHRQ, used cognitive work analysis methods to model emergency medicine operations, functions, and information needs. The team then completed an iterative brainstorming and design phase in which novel display concepts were sketched, prototyped, and implemented using Adobe Flash. Information from a heuristic usability phase, involving emergency medicine physicians and nurses as participants, provided additional feedback for a final set of design changes. Currently, the prototype is being tested in terms of its ability to support situation awareness during an immersive, interactive simulation scenario in which physician-nurse teams collaborate to monitor patients and information displays on the prototype, while caring for high fidelity mannequin patients, and performing realistic ED assessment tasks in a clinical simulation center.
HFES Student Chapter News

The UB student chapter of HFES is looking forward to an exciting year with the influx of many new students in the concentration this fall. Members stayed in touch over the summer at two UB HFES sponsored social events: a club dinner and a karaoke night. This fall we kicked off the new academic year with another annual welcome event at the Albright-Knox Museum of Modern Art in the Elmwood Village area of Buffalo. Our two main activities for fall semester will include sponsoring a human factors awareness and educational event sometime during the month of October, which HFES has declared National Ergonomics Month, as well as attending the 2013 Inter-University Workshop. The IUW is a student human factors conference involving the Universities of Waterloo, Toronto, and Buffalo, which is hosted at one of the schools late each fall on a rotating basis. Last year in Toronto, UB HFES had over a dozen members in attendance, two of whom give talks as well as another member who participated in the poster contest (which she subsequently won!). We expect this year’s turn out for the conference in Waterloo will be no less. Lastly, UB HFES is excited to once again be participating in the Auburn Ergonomics Design Competition, fielding a team of highly skilled and motivated students. We have a strong history of finishing very well in this challenge and wish our members the best!

Recent HF Ph.D. Dissertations


Alumni Profile

Brian D. Green, Ph.D. ‘10
Human Factors Engineer
United States Nuclear Regulatory Commission

Brian Green is a human factors engineer for the U.S. Nuclear Regulatory Commission (NRC) Office of New Reactors. Dr. Green reviews designs of nuclear power plant control rooms to assure that they are designed according to regulation. He has written a series of procedures to be used by the NRC while performing human factors verification and validation inspections on new large water reactor designs. He is currently preparing guidance related to small modular and sodium-cooled fast reactor designs. Recently he co-authored a proposal for a scoping study considering the potential uses of adaptive automation in nuclear power plant applications. Dr. Green also contributed analyses used in the After Action Report to the NRC response at Fukushima Dai-ichi.

Dr. Green earned his Ph.D. at the University at Buffalo in 2010 studying human trust of anthropomorphic agents and his M.S. in 2006 studying the influence of personality on inspection task performance. Dr. Green also works as an adjunct professor at George Washington University where he works in the Psychology Department. Contact him at briandanielgreen@gmail.com.

Congratulations to Dr. Sean Wu, who was recently promoted to Associate Professor with tenure.