



In many high-risk, safety-critical environments, such as medicine, driving, and aviation, operators are required to divide their attention among numerous tasks and sources of information. Multimodal displays, i.e., that present information in visual, auditory, and tactile forms, in parallel, have been developed to help support attention/interruption management and, in turn, good operator performance. However, in today's data-driven domains, the probability of a person being faced with three or more concurrent, but unrelated, signals in separate modalities is highly likely, yet the extent to which people can perform this task is not well understood. During this presentation, two experiments will be described that assess how well operators can process simultaneous signals in different modalities. This ability was examined both in the absence and presence of an on-going simultaneous task (simulated driving). Then, a final experiment will be explained that employs a display adaptation technique to overcome breakdowns in signal detection performance. This work focuses on adults 65+ years as they are the fastest growing age-group, are known to suffer from sensory deficiencies, and experience difficulties with divided attention. While the application domain for this research is primarily driving, Dr. Pitts will provide insight into the commonalities between drivers and physicians, and their interactions with human-machine systems at the genotype level. Through informed display design, this work will ultimately contribute to increased public safety in a wide range of complex domains.

Brandon Pitts, PhD, is a post-doctoral research fellow in the Center for Healthcare Engineering and Patient Safety (CHEPS), as well as in The Human-Automation Interaction and Cognition (THiNC) lab in the Center for Ergonomics at the University of Michigan (UM). In January 2017, Dr. Pitts will begin as an assistant professor in the School of Industrial Engineering at Purdue University in West Lafayette, IN. His research focuses on using vision, hearing, and touch to support humans in data-rich, complex environments such as driving, aviation, and medicine. In particular, his work examines the perceptual abilities and challenges of older adult populations, and their implications for the development of adaptive interfaces. Dr. Pitts received a B.S. in Industrial Engineering from Louisiana State University (LSU) in 2010, and a M.S.E. and Ph.D. in Industrial and Operations Engineering (IOE) from UM in 2013 and 2016, respectively. He is the recipient of several awards including, a 2011 National Science Foundation Graduate Research Fellowship (NSF GRF), 1st place in the 2016 UMTRI/ATLAS Meeting the Challenges of Safe Transportation in an Aging Society Symposium poster competition, and a 2013 Distinguished Leadership Award given by the UM College of Engineering. He is a registered Engineer Intern (E.I.T.) with the State of Louisiana, as well as a member of the Human Factors and Ergonomics Society (HFES) and the Institute of Industrial and Systems Engineers (IISE).

The seminar series "Providing Better Healthcare through Systems Engineering" is presented by the U-M Center for Healthcare Engineering and Patient Safety: Our mission is to improve the safety and quality of healthcare delivery through a multi-disciplinary, systems-engineering approach. For additional information and to be added to the weekly e-mail for the series, please contact genekim@umich.edu

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