MOTION AND WORKING MEMORY

Bridging Applied and Fundamental Research to Understand How Motion Cueing in Flight Simulators Affects Pilot Training

Dr. Chris Herdman

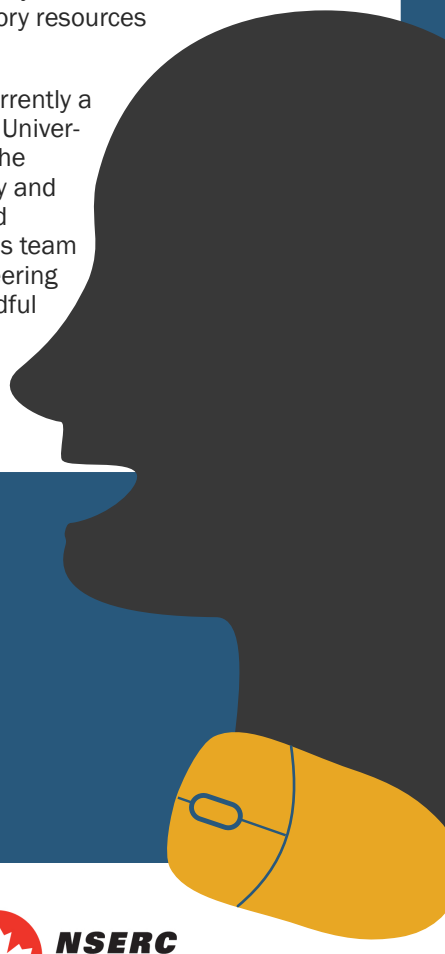
Professor of Cognitive Science and Psychology

Carleton University

NSERC CREATE CLUE
Collaborative Learning in Usability Experiences

Flight simulators are used extensively in pilot training. These simulators range from small desktop systems to more complex part-task trainers and large-scale simulators that provide realistic representations of the aircraft. At the highest level of certification, flight training simulators are required to include motion platforms that move the flight deck in 6 degrees of freedom (6 DOF). Simulators that are equipped with 6 DOF motion platforms are expensive and typically occupy a large footprint in a flight training facility. Moreover, including 6 DOF motion into a flight simulator is expensive and adds significant cost to the life-cycle maintenance of the device. Interestingly, there is very little evidence showing that 6 DOF motion facilitates pilot training. In this talk I will present two lines of research on motion cueing that were conducted at the Carleton University ACE Lab. The first line of research was oriented toward the applied end of the research spectrum. In this research, a helicopter flight simulator equipped with a 6 DOF motion platform was used to examine pilot performance across a broad range of piloting tasks. No impact of motion cueing on pilot performance was been found. The second line of research was oriented toward the fundamental end of the research spectrum. This research showed that processing of motion cues utilizes limited-capacity cognitive resources in working memory. We suggest that motion cues may have an indirect impact on pilot performance. In particular, processing of motion cues may utilize working memory resources that are also required by a pilot to complete cognitively demanding tasks in the cockpit.

Dr. Chris Herdman has been on the faculty at Carleton University since 1988 where he is currently a Full Professor of Cognitive Science and Psychology, as well as the Scientific Director of Carleton University's Visualization, Simulation and Modelling (VSIM) Centre. Dr. Herdman is also the Head of the Advanced Cognitive Engineering (ACE) Lab. Dr. Herdman's research is focused on the discovery and application of fundamental principals of human perception and cognition to the design, test and implementation of human-in-the-loop systems. His research is interdisciplinary in nature and his team at the VSIM ACE Lab includes students and faculty from the human sciences, aerospace engineering and computer science as well as from the humanities. In 2012, Dr. Herdman was one of a handful of academics invited by NASA to contribute to a FAA-sponsored working symposium focused on identifying issues facing next generation simulation-based training of pilots. Dr. Herdman has also contributed to NATO Technical Panels. Dr. Herdman and his team work extensively with industry partners from across Canada and with key government agencies.



March 2nd, 2017
12:00pm - 1:00pm
Azrieli Pavilion 238
Carleton University

All welcome.
No need to RSVP.

Carleton University · Queen's University · University of Ontario Institute of Technology · NSERC CRSNG

http://clue.carleton.ca/