

Assisting Team Supervision in Semi-Autonomous Unmanned Vehicle Operations

Stacey D. Scott¹, Farzan Sasangohar¹, M. L. Cummings²

¹Department of Systems Design Engineering, University of Waterloo, Waterloo, ON

²Humans & Automation Lab, Massachusetts Institute of Technology, Cambridge, MA

Effective distributed teamwork is becoming increasingly critical as modern and future unmanned vehicle systems operations move towards network-centric operations where commanders, operators, and vehicles (and their onboard sensors) are often remotely located. Mission commanders and their operators often use distributed collaboration technologies, such as email, instant messaging, and desktop conferencing, for communication and information sharing. However, reliance on these “explicit” communication tools for maintaining awareness of remote collaborator’s ongoing activities and status requires effort from both parties and can be disruptive. This is particularly true for commanders responsible for overseeing and coordinating a variety of operator and vehicle activities. To address this issue, we are exploring an activity-centric design approach that aims to help commanders of unmanned aerial vehicle (UAV) missions remain apprised of local and remote operators’ and vehicles’ activities, while minimizing disruption. In addition to promoting *ongoing* activity and situation awareness, we are also exploring design approaches that enable mission commanders to rapidly and effectively *regain this awareness* after an interruption occurs in the mission environment. This paper will overview these design approaches and present results from a series of formative evaluations of our prototype designs. These evaluations were conducted in an experimental platform designed to emulate futuristic semi-autonomous UAV team mission operations.

Co-presenters: Stacey D. Scott & Farzan Sasangohar

Name: Stacey D. Scott

Affiliation: Department of Systems Design Engineering
University of Waterloo

Position: Assistant Professor

Contact Information: e: s9scott@uwaterloo.ca

p: 1-519-888-4567 ext 32236

Bio: Stacey Scott is an Assistant Professor in the Department of Systems Design Engineering at the University of Waterloo in Waterloo, ON. Dr. Scott received her Ph.D. in Computer Science (specializing in Human-Computer Interaction and Computer-Supported Collaboration) from the University of Calgary (Calgary, AB) in 2005. She received her B.Sc. in Computing Science and Mathematics from Dalhousie University (Halifax, NS) in 1997. From 2005-2007, she was a postdoctoral researcher in the Humans and Automation Lab at the Massachusetts Institute of Technology (Cambridge, MA, USA), where she led a research team developing awareness interface technologies to facilitate collaborative decision-making in time-critical unmanned aerial vehicle (UAV) mission control operations. Dr. Scott’s research interests include collaborative systems design, large-screen displays, awareness interfaces, and information visualization.

Cite as: Scott, S.D., Sasangohar, F., Cummings, M.L. (2008). Assisting Team Supervision in Semi-Autonomous Unmanned Vehicle Operations. Abstract and Presentation at *UVS Canada: Conference on Unmanned Vehicle Systems Canada*, November 4-7, 2008, Ottawa, ON.

Name: Farzan Sasangohar
Affiliation: Department of Systems Design Engineering
University of Waterloo
Position: Graduate Student, Masters of Applied Science Candidate
Contact Information: e: fsasango@uwaterloo.ca

Bio: Farzan Sasangohar is an MASc candidate in System Design Engineering at University of Waterloo, Canada. He received his BCS in Computer Science from the University of Waterloo, Canada in 2007 and his BA in Information Technology from the York University, Canada, in 2008. He also holds an undergraduate degree and has some work experience in Architecture. Farzan's research interests include Human-Computer Interaction (HCI) and Computer Supported Cooperative Work (CSCW). His current research focus is on interruption recovery in human-supervisory task environments.