

Visual Analytics for future UAS operation

PROGRAM DESCRIPTION

This project explores visual display concepts to harness automation for future improvements of unmanned aerial systems (UAS) in dynamic operational environments.

OPERATIONAL GAP

The expectations for the future role of unmanned systems in military operations keep growing. There is a significant gap between today's reality, where multiple operators control one unmanned vehicle, to tomorrow's vision of a UAS mission manager seamlessly employing automation and decision support to stay abreast of multiple vehicles in dynamic battlespaces.

VALUE TO THE WARFIGHTER

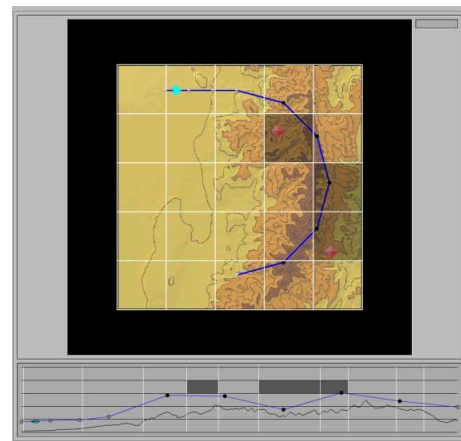
The complexity of managing technology, information and multiple mission requirements of fast-paced, uncertain battlespaces of the future threatens to overwhelm even the most resilient warfighter. Grounding displays and automation management concepts in human perception and information processing helps ensure that these concepts will be usable. And having them designed to achieve mission task goals helps ensure they will be effective.

APPROACH

With a task- and user-centered design process and the latest applied cognitive science on the supervisory control of automation, new UAS supervision and management display concepts have been prototyped and empirically evaluated. Interviews have been conducted with Navy UAV operators recently returned from Iraq. A synthetic UAS re-planning testbed has been created that embodies the key cognitive challenges identified in the interviews. Controlled human performance lab studies conducted within the testbed help to refine and validate the display concepts empirically.

IMPACT

This ongoing project is producing an evidence base of validated concepts against which to design the future UAS mission management suite. The cognitive issues and challenges identified by UAV operators have been successfully reproduced in the lab in the UAS mission testbed and mitigated with new visualization tools. Redesigned and augmented ground control station displays were shown to speed UAV replanning 50% while more than halving user errors.



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