Human Systems integration division

Intelligent Spacecraft Interface Systems (ISIS) Lab

Objectives

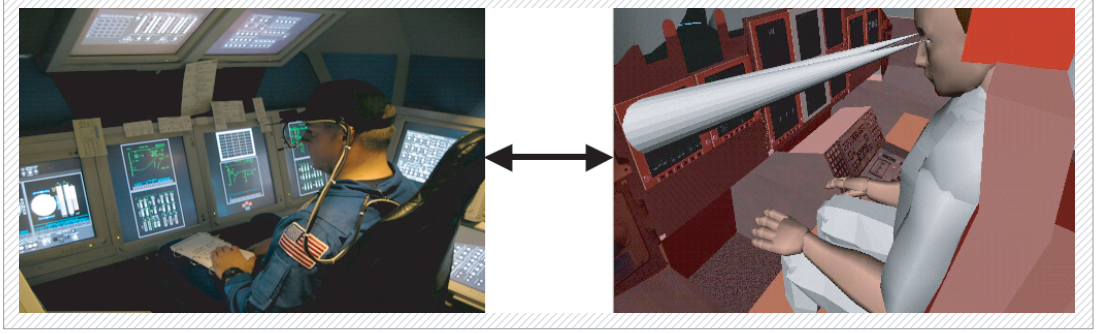
1. Test and evaluate advanced spacecraft operations concepts and associated crew-vehicle interfaces during dynamic flight phases via human-in-the-loop simulation support testing by verification and testing by analysis
2. Develop computational models of human performance in complex multi-tasking environments to automate the process of testing and evaluating candidate operational concepts in next-generation spacecraft cockpits.

Approach

The ISIS lab combines state of the art human behavioral measurement tools (ISCAN head-tracker, reconfigurable flat-panel monitors, and data collection software) to conduct and analyze operator performance during part-task simulations of off-nominal scenarios during dynamic phases of spacecraft flight (ascent/entry). Analyses of eye movements are combined with analyses of traditional human factors performance measures (e.g., switch throws, key presses, hand control inputs, latencies, error rates, and subjective workload ratings) to determine operators' information acquisition, attentional allocation, and display usage strategies.

Impact

Our findings assist the spacecraft development community in the design, test, evaluation, and validation of operational concepts and supporting user interfaces for next-generation crewed vehicles. In addition, our results feed a parallel development effort to build a human performance modeling tool capable of predicting complex stochastic oculomotor behaviors, such as scan patterns and fixation durations. The goal is to use the tool to streamline the process of testing and evaluating candidate operational concepts and associated operator interfaces for next-generation spacecraft.



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