



Human-Centered Systems Laboratory

Objective The Human-Centered Systems Laboratory (HCSL) at NASA Ames Research Center brings together multiple computing platforms and a variety of applications to support medium-fidelity flight deck simulations for the study of Next Generation (NextGen) displays, operations and procedures.

Approach The HCSL Flight Deck Surface Operations Simulation facility includes:

- Four simulation computers
- Medium-fidelity LCD large-screen forward-view projection
- Serial-box flight controls
- An eye-tracking system with eye/head integration
- An electronic moving map
- A Head-Up Display (HUD)
- Video editing and playback, video capture and data capture with time-code registration
- An experimenter's workstation for planning, simulation control, data analysis, and simulation playback



HCSL Flight Deck Surface Operations Simulator

The facilities capabilities, representing approximately 15 person-years of development, include:

- Simulation workstations with Eye tracking capability to assess pilot usage and operations
- Advanced scenario development and implementation software for the controlled simulation of surface operations events (datalink, traffic control, etc.)
- Customized data analysis software for the analysis of scenario events, pilot performance data, and eye-tracking data

Impact Data collected from approximately 200 pilots have directly influenced design of displays, operations, and procedures improving the efficiency and safety of surface operations. Since 1996, approximately 200 pilots have contributed to this data by participating in controlled surface operations in the HCSL Flight Deck Surface Operations Simulation facility (shown). Projects have included the development of an avionics suite for airport taxi operations (the Taxiway Navigation and Situation Awareness, T-NASA, system), NextGen time-based taxi clearances, and pilot usage of Synthetic Vision Systems.

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