Human Systems
integration division

Human-Centered Systems Laboratory Airport and Terminal Area Flight Deck Simulator

Objective

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

HCSL Airport and Terminal Area Flight Deck

Approach

The HCSL Airport and Terminal Area Flight Deck Simulation facility (shown) includes a 135 deg LCD out-the-window forward-view, flight controls (MCP, FMS, CDU, yoke, brakes, tiller, throttles), an electronic moving map, datalink input, an eye-tracking system integrated with data capture into the simulation event/data stream, and an experimenter's workstation for scenario creation with realistic traffic, simulation control, data analysis, and playback. The facilities simulation and analysis capabilities, representing more than 15 person-years of development, include: 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, ATC events, etc.); and, Customized data analysis software for the analysis of scenario events, pilot performance data, and eye-tracking

Impact

Data collected from approximately 250 pilots have directly influenced the design of concepts, displays, operations, and procedures improving the efficiency and safety of airspace operations. Since 1996, approximately 250 pilots have contributed to this data by participating in controlled surface operations in the HCSL's simulation facilities. 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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