



Operator Performance Laboratory (OPL)

<http://opl.ecn.uiowa.edu>

- The OPL conducts human factors research in a number of areas of surface and air transportation.
 - Directed by Tom Schnell, Associate Professor in Mechanical and Industrial Engineering, Commercial Pilot, USAF Aux. CAP Mission pilot, Flight Instructor
 - OPL has 17 members including graduate and undergraduate students, full time research engineers, emeritus faculty, research pilots, and crew chief.



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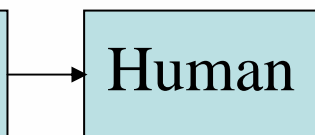
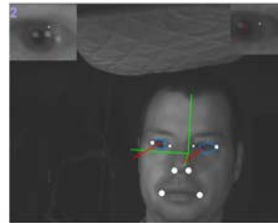
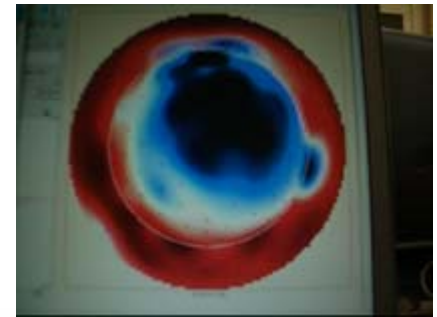


Workload Assessment using Physiological Measures; Cognitive Avionics Applications

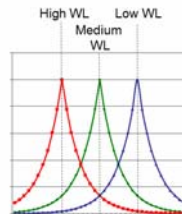
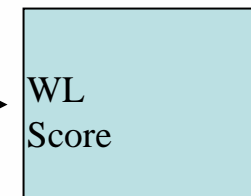
Research approach: Deploy 128 electrode EEG in an airborne flight test platform

Dense array EEG is used to localize sources of activity in the brain for different levels of workload

This data is being used to design models that can predict workload as a function of EEG activity



Physio to Workload Converter

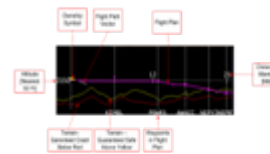




Prevent Controlled Flight into Terrain (CFIT)

Synthetic Flight Bag (SFB), Technology that can save lives

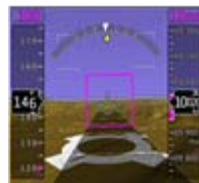
The Problem: CFIT in General Aviation, “Drilling Hills with Aircraft”



SVS TRENDS

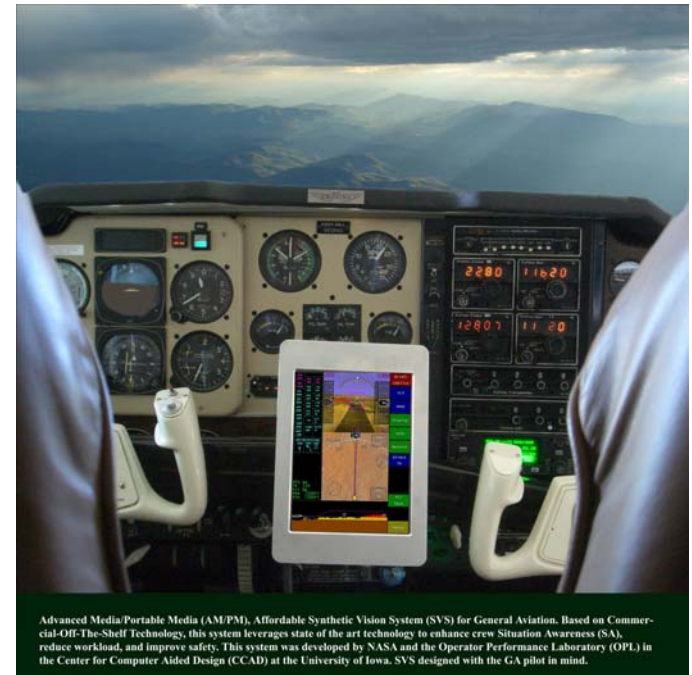
The New Synthetic Flight Bag

New SVS technology is now portable.



Dr. Tom Schell at the controls of an A-36 Bonanza during flight tests of the new Synthetic Flight Bag (SFB). The SFB provides a supplemental attitude instrument with digital terrain and other data.

Solutions Developed at Iowa



Advanced Media/Portable Media (AM/PM), Affordable Synthetic Vision System (SVS) for General Aviation. Based on Commercial-Off-The-Shelf Technology, this system leverages state of the art technology to enhance crew Situation Awareness (SA), reduce workload, and improve safety. This system was developed by NASA and the Operator Performance Laboratory (OPL) in the Center for Computer Aided Design (CCAD) at the University of Iowa. SVS designed with the GA pilot in mind.

The Synthetic Flight Bag (SFB) is a portable Synthetic Vision System (SVS) for General Aviation pilots. The SFB provides the pilot with pathway guidance and a synthetic view of terrain and obstacles.

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Prevent Rotorcraft Hull and Crew Loss due to Brownout; Hover Display Technology Developed at OPL Solutions Developed at Iowa

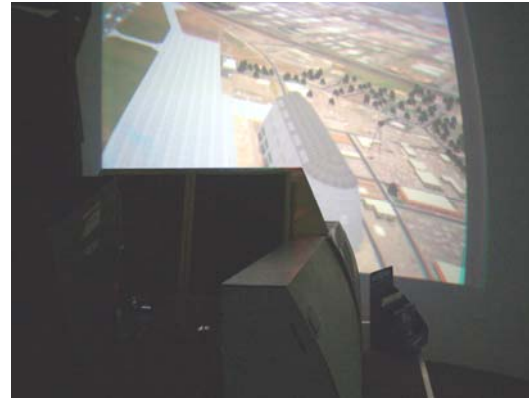
The Problem:

Military rotorcraft kick up a lot of dust during landing. Brownouts can rob the crew of necessary visibility to safely land



OPL developed various hover displays for advanced (glass cockpit) helicopters

Hover displays provide control cues to safely hover and land helicopters in reduced visibility conditions



The Synthetic Vision Hover Displays are tested at the OPL helicopter simulator facility

This research is performed in collaboration with the US Army Aeroflightdynamics Directorate (AFDD) and Rockwell Collins

