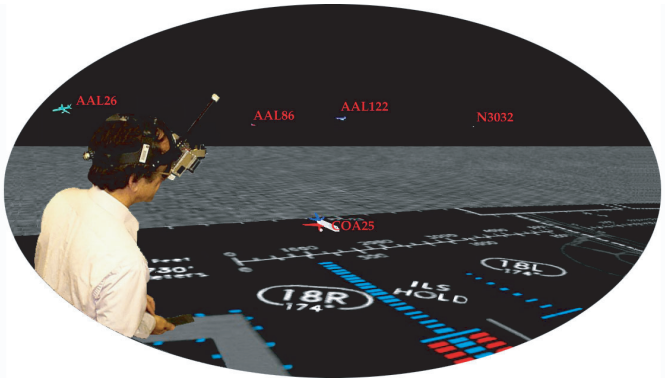
Human Factors

research and technology division

Augmented Reality Displays for the Control Tower

Objective

Virtual environment simulation has typically suffered from low visual and low dynamic fidelity because of the high cost of high-fidelity hardware and software. The current work is directed toward:



- Improving the dynamic fidelity of the virtual environment system, with the goal of accurately rendering in depth virtual objects that could naturally designate aircraft positions as seen from a control tower
- Developing and testing improved techniques for the dynamic registration of superimposed computer-generated imagery in the application

Approach

High dynamic fidelity is needed for perceptual stability of the virtual objects that are the aircraft symbols, a feature needed for the user sense that the objects can be seen stably through the tower windows. The required dynamic fidelity is determined through psychophysical testing and part-task simulation of several specific tasks for which the virtual environment or augmented environment system (head-mounted optical overlay of computer graphics) is liked to be used.

Predictive filter techniques for improving the dynamic registration of augmented reality displays are then designed, developed, and tested, and evaluated.

Impact

Augmented reality displays may result in reduced workload and improved spatial situation awareness for air traffic controllers in the control tower. Visual flight rules could then be extended into new conditions through electronically enabled ability to see through fog and occluding obstacles.

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