Demo: The Predator UAV Synthetic Task Environment

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The Predator UAV Synthetic Task Environment (STE) is a realistic simulation of the flight dynamics of the Predator RQ-1A System 4 UAV with built in tasks and data collection capabilities. The core aerodynamics model of the UAV STE is used in the training system for Air Force Predator pilots at Indian Springs Air Force Auxiliary Field in Nevada. The UAV STE is essentially a scaled down version (hardware wise) of the training system. The three tasks built on top of the core aerodynamics model include: the *Basic Maneuvering Task,* in which a pilot must make very precise, constant-rate changes in airspeed, altitude and/or heading; the *Landing Task* in which the UAV must be guided through a standard approach and landing; and the *Reconnaissance Task* in which the goal is to obtain simulated video of a ground target through a small break in cloud cover. For each task, there are multiple scenarios which manipulate various performance requirements (e.g. turn right, turn left and climb) and external conditions (e.g. wind, no fly zones). During performance of a task, the values of approximately 100 different aircraft and human performance variables are recorded every 200 msec. The design of these synthetic tasks is the result of a unique collaboration between behavioral scientists and expert pilots of the UAV. The aim in developing the tasks was to identify important aspects of the UAV pilot's overall task—aspects that tax the key cognitive and psychomotor skills required of a UAV pilot. They are tasks that lend themselves to laboratory study, yet do not fall prey to oversimplifications. Tests using military and civilian pilots showed that experienced UAV pilots perform better in the STE than pilots who are highly experienced in other aircraft but have no UAV experience, indicating that the STE is realistic enough to tap UAV-specific pilot skill. This demo will provide workshop attendees an opportunity to try the research tasks themselves and discuss the possible use of the STE in their own research.