

Playbook® Control of Multiple UAS in a Coordinated Target Engagement

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This effort is part of an on-going program to evaluate methodologies for a single operator to supervise multiple UAS. The current work integrated a delegation methodology, Playbook (Miller and Parasurman, 2007), into the Multiple UAV Simulation Environment (MUSE). An analytical comparison was made between manual control of three UAS and Playbook® control in a coordinated target engagement mission.

Playbook® is a methodology to delegate authority to perform certain tasks to automation. To demonstrate and evaluate the utility of Playbook® in an operational environment, it was integrated with the MUSE system. A coordinated mission among three UAS was instantiated and a “prosecute target” play developed. An analytical comparison was made between manual execution and Playbook®.

Operator tasks and associated workload were analyzed in both Playbook® delegation control and manual execution. The three mission tasks, consisting of navigation, sensor control and weapons control were separately evaluated in terms of approximated operator workload. Comparisons revealed a workload reduction across all three mission tasks, when using Playbook® control. Playbook® delegation reduced operator workload on navigation tasks by approximately 40%. The Playbook® planner mitigated workload by coordinating and optimizing flight plans.

Sensor control tasks controlled by Playbook® delegation reduced operator workload by approximately 2/3 when compared with manual execution. This time savings was achieved through Playbook® coordination of flight vehicles and collaboration of intelligent sensor management across vehicle platforms.

Lastly, Playbook® delegation reduced operator workload by 75% in weapons control tasks. Delegation control insured firing position and pre-launch constraints, preparing for the operator’s final authority for weapons release.

A DVD on this demonstration will be shown.