

CREATE

2016



Photo: Petty Officer 3rd Class Joshua Fulton

CREW ROLE-PLAYER ENABLED BY AUTOMATED TECHNOLOGY ENHANCEMENTS (CREATE)

Training a single trainee in a task that requires a crew or group to complete it.

The Crew Role-player Enabled by Automated Technology Enhancements (CREATE) effort seeks to solve a long-standing training challenge – how to train a single trainee in a task that requires a crew or group to complete it. Although the instructors can (and currently do) act as role players, this distracts from the primary objective to provide performance monitoring and feedback. With recent technological advances in speech recognition, the feasibility of incorporating synthetic role-playing crewmembers into a dynamic training event has increased.

THE NAVAL NEED

A training gap exists within the P-8A part-task training (PTT) systems; current capabilities lack inter- and intra-crew communication training opportunities. This is of specific interest for the Tactical Coordinator (TACCO), who is responsible for the tactical portion of a maritime patrol or surveillance mission.

INTELLIGENT, INTERACTIVE ROLE-PLAYER AGENTS

- Synthetic crewmembers interact with trainees using real-time speech recognition and generation
- Simulate interactive crewmember behaviors and communications (e.g., AWO, EWO, Co-TACCO)
- Situation-aware; adaptive to non-scripted training scenarios; using open-source cognitive architecture



He or she serves as the nexus of mission-level information, as well as directing sensor operators and overseeing the tactical aspects of the mission. This role relies heavily on communication within and external to the aircraft. Opportunities to practice mission-critical soft behavioral skills like Crew Resource Management (CRM) are paramount to warfighter readiness and success. Unfortunately, the PTT currently relies on instructor role-playing to achieve this, resulting in limited communication and coordination training opportunities. Although P-8A flight crews train alongside other trainees in advanced tactical training, an early focus on these skills allows the aircrew to optimize these crew training scenarios.

The operational need for the technology within the PTT lies in the intricacy of a single instructor *controlling multiple* PTT scenarios while role-playing.

Given the complexity of the training system itself, the instructor is responsible for monitoring multiple systems (e.g., instructor operator station, semi-automated forces) for multiple students. This task alone requires significant attention, but instructors must also multi-task/task switch to monitor trainee performance and interject role playing communications as required. For this reason, TACCO trainees receive limited crew coordination training within this environment. The impact has been reported by the fleet, citing a lack of communication skills later in the training pipeline.

Developing a software suite that provides a synthetic role-playing capability serves to enhance individual training, and potentially provide value added for more advanced training. The benefit is the ability to provide trainees with realistic communication and coordination required for training, without the need for an entire air crew or complement of Subject Matter Experts (SMEs) role-players. Additionally, instructors will now be free to focus on assessing the trainee's performance, modifying the scenario, and providing quality feedback to enhance training.

THE *CREATE* SOLUTION

The Basic and Applied Training and Technologies for Learning and Evaluation (BATTLE) Lab at NAWCTSD, partnered with NAVAIR PMA-205, PMA-290, the Small Business Innovative Research (SBIR) Office, and industry partners is developing synthetic, interactive models for P-8A crewmember agents (e.g., Acoustic Warfare Officer, Electronic Warfare Officer, Co-TACCO) under an on-going SBIR effort. The complexity of generating a virtual role player that can participate in a training scenario as an integral part of an aircrew has required advancing robust speech recognition generation and dialog capabilities, as well as behavior modeling. This innovative project attempts to fill an existing gap in P-8A individual crew training, and allows the interactive synthetic agents to simulate the actions and communication of other crewmembers. This capability is valuable as maritime mission sets increasingly involve, and rely upon, improved communication among onboard crew, and coordination with other platforms, such as ships and other aircraft.



P-8A Poseidon flying over Patuxent River, MD.

FUTURE EFFORTS

As the foundational technologies are matured, development will continue to support a wider variety of training situations. Specific focus areas include:

- Advancing speech interaction including open-ended dialog support, end-user speech authoring, and customization support
- Expanding speech and behavior modeling for additional training use cases
- Integration of capability into additional training systems and domains
- Implementation of interactive synthetic crewmember capability and testing of capability by the end user community for refinement