Topic: N162-090

Adaptive Immersion Technologies

Sustained Attention Training in Unmanned & Remote Navigation (SATURN)
Adaptive Immersion Technologies specializes in creating innovative training and human-performance management technologies. Their Sustained Attention Training in Unmanned and Remote Navigation (SATURN) system is an adaptive, game-based training system for unmanned aerial system (UAS) operators, targeting the attention control skills required during long-haul UAS missions. With a constant performance measurement capability, SATURN can automatically adapt training content to provide the right level of challenge based on an individual operator's skill strengths and deficiencies. SATURN is intended to be operated as a standalone training device, as well as integrated into existing training simulators for UAS operators. Currently platform-agnostic, SATURN can be rapidly customized for any UAS platform, integrated with the required models, mission requirements, and associated attention control challenges.

Technology Category Alignment:

Fixed Wing Vehicles (includes UAS)
Autonomy
Human/Autonomous System Interaction and Collaboration
Human Systems
Personalized Assessment, Education, and Training

Contact:
Phillip M. Mangos
phillip.mangos@adaptiveimmersion.com
(813) 815-1999
http://www.adaptiveimmersion.com
SYSCOM: NAVAIR
Contract: N68335-18-C-0139
Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0139

Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

NAVAIR 2018-731

Topic # N162-090

Sustained Attention Training in Unmanned & Remote Navigation (SATURN)

Adaptive Immersion Technologies

WHO

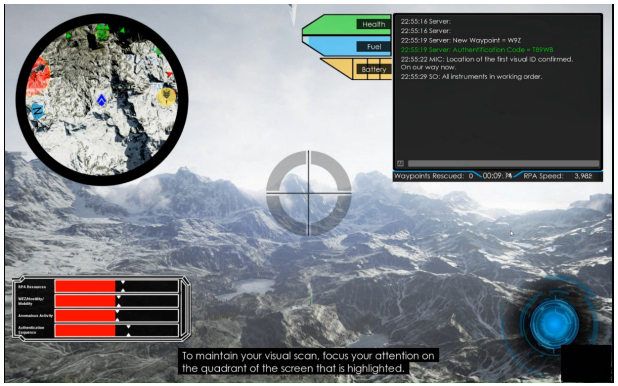
SYSCOM: NAVAIR

Sponsoring Program: PMA-205, Naval Aviation Training Systems

Transition Target: PMA-205

TPOC:
(407)380-4567

Other transition opportunities: This technology would be transitioned as a standalone training device to PMA-205. Additionally, we have identified other PMAs who are interested in integrating the SATURN training system with existing training simulators, including PMA-281, PMA-262, and PMA-268.



WHAT

Operational Need and Improvement: There is an increasing requirement for unmanned system operators to maintain attention for long periods of time during missions. Included are operators of Air vehicles (Unmanned Air Vehicle/Unmanned Aerial System [UAV/UAS]; Remotely Piloted Aircraft [RPA]); Unmanned Ground Vehicles and Robotic Systems (UGV); Unmanned Surface and Unmanned Underwater Vehicles (USV, UUV) and Space Vehicles. It is not uncommon for these operators to work shifts of up to 12 hours. Operators who conduct missions for long periods of time are at risk for higher fatigue levels, degraded task performance, and higher error rates. While there are training simulators for developing job-related skills, there are currently no systems that focus on training attention-related skills.

Specifications Required: The objective is to develop a training system focused on enhancing attention control skills of unmanned system operators. The specifications for this training system include that it must be adaptive (i.e. capable of tailoring instruction and training content to an individual's strengths and deficiencies). Additionally, the training solution must be cost-effective, computer-based, and programmed with a wide variety of training operations and mission requirements.

Technology Developed: To address the training requirements outlined, Adaptive Immersion Technologies (AIT) developed Sustained Attention Training in Unmanned & Remote Navigation (SATURN) – a closed-loop, adaptive game-based training system, designed to enhance the skill development and retention of attention control related skills. With a persistent performance measurement capability, SATURN constantly measures individual's skills, automatically adapting the training content based on the unique skill strengths and weaknesses of each individual. As a closed-loop system, SATURN requires very minimal instructor intervention, enabling trainees to practice frequently on a variety of different missions and operational requirements.

Warfighter Value: The ultimate goal for AIT's SATURN technology is to enhance operators' overall attention during unmanned operations. By frequently practicing training content—automatically engineered to provide the optimal level of challenge—operators can enhance their overall effectiveness during mission operations, proactively responding to changes in the operational tempo.

WHEN

Contract Number: N68335-18-C-0139

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Prototype development	N/A	Development of a prototype software training solution for demonstration.	4	July 2018
Performance measurement capability development	N/A	Completed algorithms and functionality for capturing user performance and training adaptations.	4	July 2018
Transition planning	N/A	Identified avenues for transitioning training solution to end-users.	4	July 2018
Training content expansion	Med	Software training solution with additional training content categories, expanded missions, and performance measurement opportunities.	6	January 2019
Training effectiveness	Med	Completed experimental studies outlining the effectiveness of the training system, and recommendations to improve its training capability.	6	January 2019

HOW

Projected Business Model: The SATURN system will be offered as a license to install the software into standalone computer workstations and laptops, as well as integrate into existing training simulators for unmanned systems. AIT will provide technical assistance and detailed documentation for installation and use of the system. Additionally, AIT will provide updates and/or patches to improve the system, which may include additional scenario training content, and customization for specific unmanned systems platforms. This software would be a direct development for the Government.

Company Objectives: The SATURN system is agnostic to any unmanned platform. The ultimate objective of SATURN is for it to be customized specifically for different unmanned platforms, focusing on the unique attention requirements specific to each unmanned system.

Potential Commercial Applications: In addition to meeting the training requirements for military unmanned operations, AIT intends to develop training content customized for commercial unmanned operations. AIT has identified several commercial unmanned vehicle occupations that maintain similar attention problems experienced in military operations. The commercial unmanned domain would benefit from a training system that is unique and adaptable, based on the training needs of the end-users, as there is currently no training system specific to addressing the attentional skills needed for unmanned systems operations.

Contact: Phillip M. Mangos, President and Chief Scientist
phillip.mangos@adaptiveimmersion.com 813-815-1999