Department of the Navy SBIR/STTR Transition Program

Topic # N172-117
Mishap Awareness Scenarios and Training for Operational Readiness Responses
Soar Technology, Inc.

WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA205

Transition Target: Navy Medicine Operational Training Command (NMOTC), Naval Survival Training Institute

TPOC: (407) 380-4773

Other Transition Opportunities: Naval Safety Centers; Army, Air Force, Marine Corps, and Coast Guard aviation training and safety; commercial civil training programs as well as commercial, cargo, and on-demand flight schools, both fixed- and rotary-wing

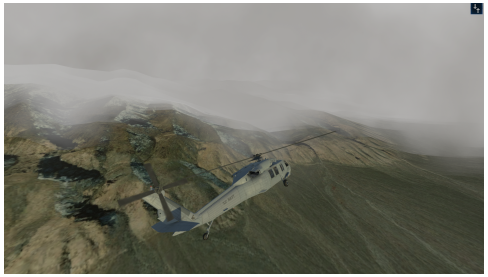

Image generated from Soar Technology's WingMAN software.

Notes: Wing Mishap Awareness Narratives (WingMAN) allows a user to create both real and notional scenarios in order to illustrate a variety of mishaps, including Spatial Disorientation. Narratives can be shared as videos, embedded instructional media, and immersive 360-degree videos.

WHAT

Operational Need and Improvement: Spatial Disorientation (SD) is cited as a contributing factor in five to ten percent of all aviation incidents; however, when SD does occur, over ninety percent of those incidents prove to be fatal (Heinle & Ercoline, 2002), and SD is believed to be under-classified. SD impacts both fixed- and rotor-wing aviators, and SD can and does impact pilots at every skill level, from low-flight-time general aviation pilots through to the most experienced high-performance military pilots.
To combat SD, aviation instruction provides exposure to SD materials at multiple points in the training process, with varying levels of fidelity. Enhancing classroom-based SD education with more engaging and dynamic formats, even without vestibular cues, is a potential solution to augment the SD training objective, particularly if scenarios can be created at the point of need without requiring a lengthy lead time.

Specifications Required: WingMAN allows the user to input specific scenario criteria to recreate actual mishap events as well as notional mishap events. The user can use the software to specify basic aircraft parameters (aircraft type, altitude, attitude, pitch/roll/yaw, etc.), geolocation, environment weather and atmospheric conditions (create clouds, whiteout/brownout, lighting/lux, haze, etc.), and mimic peripherals in-scenario such as a Heads-Up Display (HUD) and Night Vision Goggles (NVGs). Narrative scenarios can also contain audio and supporting materials, such as flight deck / Air Traffic Control (ATC) audio, instructional points, graphics, etc. Scenarios can be delivered via classroom briefing material, as embedded instruction, and as immersive 360-degree videos, as well as shared across authors as low-size xml files.

Technology Developed: Soar Technology, Inc. (SoarTech), along with partners Dr. Eric Muth of Clemson University and BGI, LLC, have designed and developed a playback-generation tool for Training Wing Mishap Awareness Narratives (WingMAN). WingMAN allows an instructor to quickly input available data from multiple sources to create a visual first-person playback of any mishap or incident for which data is available, including editing existing playbacks and creating their own notional mishaps. WingMAN also supports the automatic ingest of flight data such as black box data in order to automatically generate scenarios.

Warfighter Value: WingMAN provides a license-free, low-cost, authorable and low barrier to entry training system that puts the creation of compelling mishap narratives in the hands of the instructor (or Safety Center).

WHEN

Contract Number: N68335-19-C-0224 **Ending on:** Dec 13, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I Outbrief	Low	Prototype - Building Mishap Narratives from Black Box Data	3	2nd QTR FY18
Phase I Option Outbrief	Low	Prototype - Building Custom Scenarios Manually	3	2nd QTR FY19
Phase II Downselect Outbrief	Medium	Prototype - Narrative Generation with Atmospheric, and Formation Flying	4	4th QTR FY19
Phase II Option I	Medium	Prototype - Narrative Export to 360 Video, Advanced Maneuvers, Rotary Wing Support, Embedded Instruction, Sandbox Environment (supports 12 classes of SD scenario), effectiveness evaluation	5	2nd QTR FY21
Phase II Option II	Medium	Prototype - Refined Usability, Additional Aircraft Model(s), Refined Maneuvers	6	1st QTR FY23

HOW

Projected Business Model: Wing Mishap Awareness Narratives (WingMAN) is license-free for government use, with SBIR data rights. SoarTech also envisages teaming with larger flight training organizations to bring WingMAN to a larger audience and grow the capability.

Company Objectives: Soar Technology, Inc. (SoarTech) strives to support the Warfighter by tackling the Department of Defense's most challenging problems. In this, SoarTech's objective is to identify potential Defense users for WingMAN so that they can evaluate the utility of the software. SoarTech would also like to partner with other organizations to continue to develop WingMAN as needed, and provide WingMAN to the civilian community.

Potential Commercial Applications: Civilian aviation including on-demand flight, hobbyist flight, and cargo flights are all highly susceptible to Spatial Disorientation (SD), however they do not have Federal Aviation Administration (FAA) requirements for SD training. Feedback from participants in efficacy studies have indicated a desire by these pilots to have exposure to this kind of training in order to broaden their knowledge; this could be commercially leveraged by any number of flight schools or organizations to disseminate safety critical information and continue to remind their pilots of the potential for SD and other mishaps to occur.

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