STILMAN Advanced Strategies

Combat System Automation Management

The complexity of the cross-domain Battlespace has evolved to the point that it is not possible to manually maintain awareness of and allocate all recourses optimally in real-time. AI enhanced decision-aiding and dynamic weapon target pairing are urgently needed. Adversaries are adopting AI technology at a fast rate. If these systems leap ahead of DoD capabilities, catching up becomes a function of the rate at which the AI system learns – and can defeat the previous AI version. Stilman's technology learns the current scenario immediately. LG-RAID technology rapidly produces superior integrated plans in a matter of seconds, > 100x faster than the current manual process. LG-AI is a tool for COA creation and analysis that dynamically responds to Enemy Courses of Action (COAs). Manual multi-domain kill chain planning for Integrated Air and Missile Defense (IAMD) is labor intensive and too slow to effectively respond to time critical targets. Stilman has developed an Artificial Intelligence-based planning and supervisory decision aid for resource allocations (sensors and weapons) across multiple domains in real-time. This capability is ideally suited to quickly solve extraordinarily complex IAMD resource planning and allocation problems. As the frequency and size of raids escalates, the urgency of the response and the complexity of resource allocation decisions increases. Within a multi-domain battlespace, this complexity can quickly overwhelm the human commander's ability to successfully plan and respond. To address these problems, Stilman has developed an AI-based dynamic kill chain planning and preview capability. The AI-based analysis is fast, flexible, scalable, and explainable – and it applies to multi-domain and multi-tier sensor and weapon platforms. Dynamic, reactive resource allocation recommendations are displayed via 2D or 3D animations that provide the human commander with an on-the-loop visualization that prioritizes resource allocations in faster than real-time. This is particularly advantageous for servicing pop-up targets that suddenly appear outside of the pre-planned mission profile.

Technology Category Alignment:

Command, Control, Communications, Computers, & Intelligence (C4I)
Autonomy
Modeling and Simulation Technology

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Department of the Navy SBIR/STTR Transition Program

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Combat System Automation Management

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WHO

SYSCOM: NAVSEA

Sponsoring Program: PEO IWS 1 / OPNAV 96 / AEGIS

Transition Target: Maritime Tactical Command and Control (MTC2) / C2X Micro-service based Experimentation Architecture

TPOC:

Other transition opportunities: -Adaptive, Multi and Cross-domain Kill Chain Analysis suitable for Wargaming and Planning and Analysis (USMC, MDA, US Army, SOCOM, USAF)

- Artificial Intelligence (AI) based Course of Action Planning with Quantitative COA comparison capability and assessment metrics

- Manned and Unmanned Systems Planning and Assessment against a dynamic, reactive threat

- Explainable AI that is extensible to Human-on-the-Loop operation for manned / unmanned systems

- Adaptive, Dynamic Multi-Domain and Cross-Domain real-time allocation of sensors and assets in response to dynamic threats

US Naval Institute Public Domain Image
(https://news.usni.org/tag/spawar)

WHAT

Operational Need and Improvement: FY18-14 Integrated Air & Missile Defense of Ships and Littoral Forces
FY18-19 C2 & Decision
FY18-24 Combating Asymmetric and Irregular Warfare Threats
FY18-35 Naval Platform and Systems Operational Availability
FY18-42 Training

Specifications Required: AEGIS Common Baseline / MTC2 / C2X Architecture Standards

Technology Developed: Maritime tactical fidelity decision aid that provides quick (seconds) Course of Action (COA) Analysis using Artificial Intelligence

Warfighter Value: Rapid creation and analysis of COAs and COA alternatives based on AI. Includes Most Likely and Most Dangerous Enemy Course of Action (ECOAs), applicable to complex mission spaces where the complexity of the threat and the allocation of resources far exceed the human ability to immediately plan

Reduces time to gain situational awareness and situational understanding (SA/Su), dramatically increases tactical proficiency

Enables single, multi and cross domain adaptive kill chain planning via AI-based recommended sensor, and weapon-target pairing

Provides a fully dynamic and scalable competency OPFOR that reacts and exploits weaknesses in the BLUFOR plan in faster than real time

COAs are displayed as an animation of the OPFOR plan that includes key events and time based coordination of assets to enable SA/SU

WHEN

Contract Number: N68335-19-C-0791   **Ending on:** December 31, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
1. Trial Runs 10/20 & 3/21	Low	1 CDR w/ RAID scores as well as 5 CDRs w/o RAID given the same tactical scenario, time to plan and estimate / assess ECOA (enemy location and intent)	5/6	February 2021
2 Trial Runs: 10/20, 3/21 End of Evaluation, 6/21:	Low	LG-RAID produces 4 distinct ECOAS within 1 min each on standard CPU for complex search space on the order of 10E20,000 nodes	5/6	March 2021
3 Integration (MTC2) YR 2 Evaluation 9/21	Med	Reduced own ship detections, increased efficacy of sensor planning and weapon-target pairing	6/7	September 2021
End of Year demos , 12/2021, (TW) 2021 (PS/TW)	Med	10 to 1 reduction in time to generate ECOA, 2 to 1 reduction in time to train COA analysis skills	7	December 2021

HOW

Projected Business Model: Software License: SW is delivered under license to the end user.

Company Objectives: Develop and transition LG RAID Technology

Potential Commercial Applications: Control of Unmanned and Operator controlled Law Enforcement Unmanned Systems. STILMAN is thoroughly committed and focused on commercializing LG technology for the commercial (both defense and civil) markets. LG technology has been demonstrated to and funded by numerous major defense/aerospace companies and government organizations in the USA and abroad. These include but are not limited to Boeing, Rockwell, AMS, Thales, BAE Systems, ORINCON, DARPA, AFRL, ARL, and the MDA. Current advancements of LG serve as a catalyst for a continued and sustainable entrance into both defense and civil commercial markets using unmanned systems.

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