

Topic: N161-015

Daniel H. Wagner, Associates, Incorporated

Collaborative Airborne Anti-Submarine Warfare (ASW) Mission Evaluation and Optimization (CAMEO)

Collaborative Airborne Anti-Submarine (ASW) Warfare Mission Evaluation and Optimization (CAMEO) provides web-based collaborative mission planning tools, applications, and services to synchronize mission execution, help communicate commander's intent, substantially shorten the mission planning process, and improve the effectiveness of multi-platform, multi-sortie, multi-sensor airborne ASW and Surface Warfare (SUW). CAMEO is intended for use in the Navy's Joint Mission Planning System (JMPS), to coordinate and plan tactical and operational details of airborne ASW and SUW combat missions. CAMEO Phase II prototyping has extended and enhanced Phase I operational concepts. For 50+ years, Wagner Associates has developed/transitioned complex software components to prime contractors and Navy warfare systems, such as USW-DSS and MH-60R avionics. Our products include mission effectiveness evaluation and optimization, risk determination, and data fusion algorithms.

Technology Category Alignment:

Fixed Wing Vehicles (includes UAS)

Rotary Wing Vehicles

Human Computer Interfaces (HCI) for Decision Making

Synthesis/Analytics/Decision Tools

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SYSCOM: NAVAIR

Contract: N68335-18-C-0148

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0148

Department of the Navy SBIR/STTR Transition Program

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WHO

SYSCOM: NAVAIR
Sponsoring Program: PMA-281
Transition Target: Joint Mission Planning System (JMPS)
TPOC:
(301)757-1884
Other transition opportunities:
Aircraft Carrier Tactical Support Center (CV-TSC), Littoral Combat Ship (LCS), Undersea Warfare Decision Support System (USW-DSS), Surface Ship Combat Systems

Notes: The image to the right shows a bistatic sonobuoy laydown pattern for a P-8 aircraft, in a gridded, sample test environment. Each '+' sign represents a "post" (a co-located pair of MAC/ADAR sonobuoys). There are 23 posts, deployed starting in the bottom left of the figure. The circles provide an indication of detection range, as measured by the monostatic half sweep width at that location. The MAC sources ping in cycles, two minutes between pings. The Cumulative Detection Probability (CDP), after six hours of search, against a slow-speed (5-knot), random patrolling submarine is 90.2%.

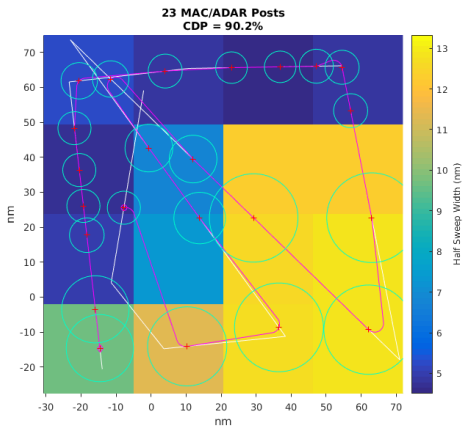


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WHAT

Operational Need and Improvement: Increasingly stealthy and capable submarine and surface ship threats pose significant challenges for planning effective airborne Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) missions, and thus a collaborative, integrated multi-platform, multi-sensor approach for ASW and SUW mission planning is needed. To assist ASW and SUW mission planners with this complex mission planning process, and reduce lengthy planning times, advanced mission planning tools are needed to develop optimal manned/unmanned airborne ASW search plans.

Specifications Required: Need open architecture optimal airborne ASW and SUW mission planning tools and software components that integrate with existing Navy mission planning systems and databases.

Technology Developed: Using genetic algorithms (GAs) CAMEO recommends militarily effective, executable, jointly optimized, and integrated airborne ASW and SUW search plans utilizing all available and relevant assets and their synergistic acoustic and non-acoustic, passive and active sensors; and quantitatively evaluates their effectiveness using operationally relevant metrics. CAMEO also provides visualization techniques that enable mission planners to (i) see the complete mission timeline, (ii) display search plans, and (iii) view the battlespace with depth-dependent target-density, sensor coverage, and search effectiveness plots.

Warfighter Value: The expected benefits of CAMEO are: (1) Significantly improved airborne ASW and SUW search and surveillance effectiveness, (2) Better exploitation of search system synergies, (3) Significantly reduced risk to friendly platforms, (4) Enhanced Situational Awareness (SA) and threat assessment, and (5) Reduced airborne ASW and SUW planner/operator time-on-task.

WHEN Contract Number: N68335-18-C-0148 Ending on: December 19, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Preliminary CONEMP & JMPS Integration Plan	Low	Positive NAVAIR Review	5	September 2018
Preliminary CAMEO Software Prototype	Low	Successful tests in Wagner lab	5	June 2019
Detailed JMPS Integration Plan	Low	Positive NAVAIR Review	5	June 2019
Full Scale Prototype CAMEO System	Low	Successful tests in Wagner lab	5	September 2019
CAMEO Demonstration	Low	Successful demonstration of operational capability with real-world and simulated data	6	December 2019

HOW

Projected Business Model: Since 1963 Daniel H. Wagner, Associates, has provided innovative and cost-effective technical solutions to complex problems in Naval Operations Analysis and commercial/government applications. We design, develop, market, implement, and provide scientific software, training, and support for custom resource optimization, decision support, multi-target tracking, and data fusion systems. Examples of successful transitions and deployments include:

- 1) Acoustic Mission Planner (AMP) in MH-60R avionics system and shipboard Joint Mission Planning System (JMPS)
- 2) Mission Optimization Configuration Item (MOCI) Web Service in Undersea Warfare Decision Support System (USW-DSS)
- 3) Net-Centric Data Fusion (NCDF) for USW-DSS
- 4) Data Fusion Engine (DFEN) in USW-DSS
- 5) Computational modules for evaluating and optimizing mine countermeasures (MCM) operations and estimating risk in MINEnet Tactical

CAMEO is targeted for direct integration into JMPS, although additional marketing opportunities include other naval systems that could benefit from CAMEO technology and software components.

Company Objectives: To use our operational experience and technical skills to address challenging problems in defense analyses and provide solutions and computational components that enable warfighters to reduce their vulnerability and conduct successful and operationally effective military operations.

Potential Commercial Applications: CAMEO algorithms and methodology have potential applications to border surveillance and port/facility security.

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