

Topic: N151-071

Daniel H. Wagner, Associates, Incorporated

Dynamic Minefield Operation (DMO)

Dynamic Minefield Optimization (DMO) evaluates and optimizes precision placement of maritime mines and sensors/effectors, and also evaluates and optimizes mine and sensor/effector delivery plans for multiple maritime minefields. DMO makes more effective use of scarce maritime mining resources, increases the military effectiveness of maritime minefields, reduces risk to friendly platforms and missions, and reduces operator time-on-task. Daniel H. Wagner Associates has over 55 years of experience in developing/transitioning complex software components to prime contractors and Department of Defense customers, and developed mission effectiveness evaluation and optimization, risk determination, and data fusion algorithms and software components for several U.S. Navy mine warfare systems, including the primary system for mine warfare planning and execution, MINEnet Tactical, and the MK18 Mod 2 Inc 2 unmanned underwater vehicle (UUV). Word Count: 124

Technology Category Alignment:

Human Computer Interfaces (HCI) for Decision Making

Synthesis/Analytics/Decision Tools

Undersea Weapons

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SYSCOM: ONR

Contract: N68335-17-C-0052

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-17-C-0052

Department of the Navy SBIR/STTR Transition Program

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WHO

SYSCOM: ONR
Sponsoring Program: PMS 495
Transition Target: MINEnet Tactical
TPOC:
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Other transition opportunities:
Harbor defense, facility protection,
System with distributed sensors

Notes: Figure shows Optimal
Allocation of Mines and Ship Count
Settings to Maximize Average Damage
to Threat

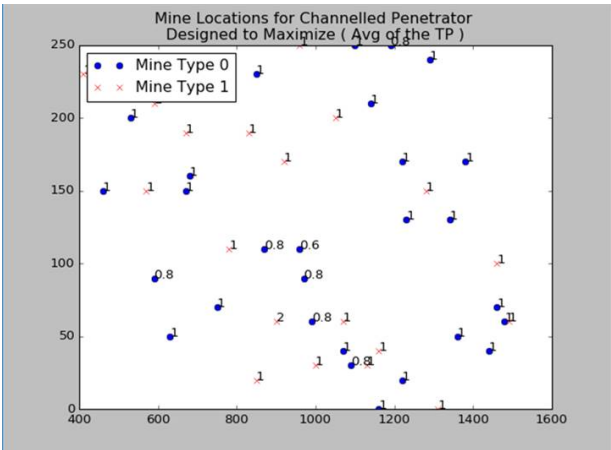


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WHAT

Operational Need and Improvement: Fleet planners have no tools for determining how best to locate, utilize, and deploy precision and advanced maritime minefields in order to maximize their warfighting contribution. Current fleet tools only evaluate the effectiveness of randomly placed conventional maritime mines.

Specifications Required: Need to optimally locate, utilize, and deploy precision and advanced maritime minefields.

- 1) Current approaches randomly distribute mines in an area.
- 2) Need to evaluate and optimize precision placement of mines and advanced sensors/effectors for multiple maritime minefields.
- 3) Need to evaluate and optimize precision placed mine and advanced sensor/effector delivery plans for multiple maritime minefields.

Technology Developed: Dynamic Minefield Optimization (DMO) evaluates and optimizes precision placement of mines and advanced sensors/effectors for multiple maritime minefields. It also evaluates and optimizes precision placed mine and sensor/effector delivery plans for multiple maritime minefields.

- Warfighter Value:**
- 1) Significantly more effective use of precision placed mines and sensors/effectors.
 - 2) Significantly more effective use of precision placed mine and advanced sensor/effector delivery resources.
 - 3) Higher probability of defeating threat submarines and surface ships.
 - 4) Reduced vulnerability of friendly forces to threat submarines and surface ships.
 - 5) Reduced planner time-on-task and much faster response to operational changes.

WHEN

Contract Number: N68335-17-C-0052 **Ending on:** January 23, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Optimize precision placed mine locations/settings	Low	Successful test in Wagner lab	5	1st QTR FY18
Optimize precision placed mine delivery	Low	Successful test in Wagner lab	5	2nd QTR FY18
Joint optimization of precision placed mine locations/settings and delivery across multiple maritime minefields	Low	Successful test in Wagner lab	5	1st QTR FY19
Optimize precision placed advanced sensor/effector locations/settings	Low	Successful test in Wagner lab	5	1st QTR FY19
Optimize precision placed advanced sensor/effector delivery	Low	Successful test in Wagner lab	5	2nd QTR FY19

HOW

Projected Business Model: Daniel H. Wagner Associates designs, develops, markets, implements and provides training for custom decision support, resource optimization, and data fusion software. Our goal is to support Navy program offices and collaborate with defense contractors to integrate these advanced decision support, resource optimization, and data fusion solutions for ship and aircraft platforms. Examples of successful transitions include:

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

Company Objectives: Rapidly and cost-effectively integrate operationally effective components into larger command and control system.

Potential Commercial Applications: Enhancements to commercial sensor placement systems (e.g., harbor defense, facility protection).

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