Department of the Navy SBIR/STTR Transition Program

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ONR Approval #2026-9-3-2820

Topic # N251-D07
AI-Aided Design (A2D)
Scientific Systems Company, Inc

WHO

SYSCOM: ONR

Sponsoring Program: ONR

Transition Target: Navy

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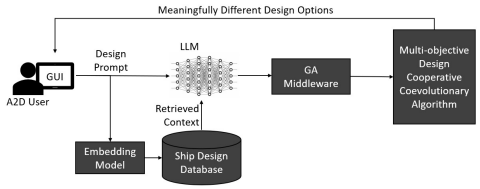
Other Transition Opportunities: SSCI's VENOM USV platform: leverage A2D to improve and optimize future design iterations.

Notes:



WHAT

Operational Need and Improvement: AI-Aided Design (A2D) is a software design tool which automates the design process for Navy vessels, with an emphasis on autonomous surface vessels up to 200 feet long. A2D will enable faster design processes, while producing manufacturable and low-maintenance designs. This will enable the Navy to rapidly increase the size of its ship fleet with low-cost and easy-to-manufacture ships.

Specifications Required: Operator provides A2D with design requirements and constraints, and optionally the mission sets which must be supported by the USV.

Technology Developed: A2D develops two key technologies: (1) a cooperative coevolutionary algorithm, or CCEA, which optimizes USV designs to be highly performant, cost-efficient, and manufacturable, and (2) a large language model (LLM) interface which enables an operator to interact with the A2D system via natural language prompts.

Warfighter Value: The key value of A2D is reducing timelines and human workload for rapidly developing new unmanned surface vessels.

WHEN

Contract Number: N00014-25-C-1319 **Ending on:** Jun 29, 2027

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Design parameterization	Low	parameter control document complete	4	1st QTR FY26
Initial fitness model	Low	initial fitness model implemented	4	2nd QTR FY26
final fitness model	Low	final fitness model implemented	4	1st QTR FY27
initial evolutionary algorithm	Low	initial evolutionary algorithm implemented	4	2nd QTR FY26
final evolutionary algorithm	Low	final evolutionary algorithm implemented	4	3rd QTR FY26
initial LLM-RAG	Low	LLM-RAG implemented	4	3rd QTR FY26
Subsystem EA	Low	EA for wiring implemented	4	4th QTR FY26
Difference Reward	Low	Difference reward fitness implemented	4	1st QTR FY27
Full CCEA	Low	CCEA implemented	4	1st QTR FY27
Ship Designs	Low	candidate ship designs produced	4	2nd QTR FY27
Ship Design Validation	Low	validated designs	4	3rd QTR FY27

HOW

Projected Business Model: Primary Navy customers are NAVSEA 05, PEO(USC), PEO(Ships), and NSWC Carderock. We envision the product of this work will transition into the Navy's Computational Research and Engineering Acquisition Tools and Environments (CREATE) program and will reside in the DoW's High Performance Computing Environment that supports CREATE

Company Objectives: Scientific System's objective is to leverage AI-enabled software to enable affordable mass at scale for the US Warfighter.

Potential Commercial Applications: Outside of Navy applications, this work is equally applicable to commercial vessels, and will significantly reduce time of cost of design; therefore we believe there is a strong market for a commercially licensed version of this set of software tools among naval architecture firms

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