N252-097: Battle Rhythm Situational Awareness and Tasking

ADDITIONAL INFORMATION
N/A

TECHNOLOGY AREAS:
None

MODERNIZATION PRIORITIES:
Advanced Computing and Software | Trusted AI and Autonomy

KEYWORDS:
AN/UYQ-100 Undersea Warfare Decision Support System; complex wartime scenarios; battle rhythm; artificial intelligence or machine learning (AI/ML); effective courses of action.

OBJECTIVE:
Develop an integrated Artificial Intelligence or Machine Learning (AI/ML) tool for battle rhythm management by operators of theater-level command and control during complex Undersea Warfare (USW) wartime scenarios.

ITAR:
The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with section 3.5 of the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

DESCRIPTION:
Operators of theater-level command and control systems, such as the AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS), must handle both simple and complex wartime scenarios. Peace-time training and exercises often lean toward simple scenarios, leaving operators under trained to handle the complexity of battle rhythms that occur during wartime.

Daily battle rhythm events often consist of morning and evening command-level updates and synchronization meetings required to execute planned operations. In low-intensity operations, the battle rhythm may be more deliberate, with daily, weekly, and monthly working groups and boards. During high-intensity operations, the battle rhythm will naturally be accelerated, but commanders and staff may be tempted to accelerate the battle rhythm more than would be useful. Battle rhythms developed during peacetime often do not effectively provide the commander and staff with timely information to make decisions. Inappropriately accelerated battle rhythms lead to operator error and degradation in situational awareness as efforts to provide updates displaces time required to perform sufficient analysis.

The Navy seeks a tool incorporating AI/ML that will support operators through the full range of complexity seen in modern warfare. The technology sought will assist USW-DSS operators in reliably and rapidly conducting battle rhythm tasking, whether during relatively routine operations or the most complex wartime scenarios. This tool does not currently exist in commercial industry.

The desired technology will make use of the range of authoritative data available to USW-DSS, to include bathymetry, sound propagation paths, track information for United States Navy (USN), allies, threats, and any commercial vessels, and planned maneuvers for USN and allied forces. From these data, the desired technology will provide situational awareness to support appropriate battle rhythm tasking, to regularize the balance between providing updates and performing the analysis and planning required to support effective courses of action. It is envisioned that the desired technology could allow machine learning to support a battle rhythm that is responsive to conflict complexity without overwhelming staff to the detriment of force effectiveness. The tool will support situation awareness, enable battle rhythm tasking, and provide a user interface to facilitate these capabilities. Finally, the tool will need to be compliant with existing information assurance (IA) and other cybersecurity requirements.

The Navy is not aware of existing commercial products that can be used to perform the requested battle tempo management support across complex, war-time scenarios, given the need to use authoritative data at multiple classification levels in a manner that complies with existing IA and other cybersecurity requirements.
Work produced in Phase II may become classified. Note: The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by 32 U.S.C. § 2004.20 et seq., National Industrial Security Program Executive Agent and Operating Manual, unless acceptable mitigating procedures can and have been implemented and approved by the Defense Counterintelligence and Security Agency (DCSA) formerly Defense Security Service (DSS). The selected contractor must be able to acquire and maintain a secret level facility and Personnel Security Clearances. This will allow contractor personnel to perform on advanced phases of this project as set forth by DCSA and NAVSEA in order to gain access to classified information pertaining to the national defense of the United States and its allies; this will be an inherent requirement. The selected company will be required to safeguard classified material during the advanced phases of this contract IAW the National Industrial Security Program Operating Manual (NISPOM), which can be found at Title 32, Part 2004.20 of the Code of Federal Regulations.

PHASE I:

Develop a concept for a battle rhythm tool that meets the requirements as stated in the Description section above. Demonstrate the feasibility of the concept in meeting Navy needs and will establish that the concept can be feasibly produced by sample testing, modeling and simulation and or analysis. The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

PHASE II:

Develop, demonstrate, and deliver a prototype battle rhythm tool and conduct a series of user designed sprints with fleet operators to refine the prototype for evaluation. The prototype will be evaluated to determine its capability in meeting the defined performance goals System performance will be demonstrated through installation and prototype testing using the cloud-based USW-DSS prototyping infrastructure provided by the government
It is probable that the work under this effort will be classified under Phase II (see Description section for details).

PHASE III DUAL USE APPLICATIONS:

Support the Navy in transitioning the battle rhythm tool to operational builds of USW-DSS provided to Fleet operators. Finalize the software design and algorithm prototype for evaluation to determine its effectiveness in an operationally relevant environment. Support the Navy for test and validation in accordance with the IWS 5.0 USW-DSS Peer Review Group.
The technology will have additional commercialization potential for other military command structures and civilian disaster-response and emergency management organizations.

REFERENCES:

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2. “AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS), Last updated 20 Sep 2021.” Navy Fact File. https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166791/anuyq-100-undersea-warfare-decision-support-system-usw-dss/
3. "Department of Defense (DoD) Cloud Computing Security Requirements Guide (SRG)." Defense Information Systems Agency (DISA), 21 Jun 2024. https://dl.dod.cyber.mil/wp-content/uploads/stigs/zip/U_Cloud_Computing_Y24M07_SRG.zip
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