Topic: N182-119

ARiA

Oceanography Tactics Training for Employment Readiness

Esail Cloud is a 3D acoustic modeling application developed by ARiA, a research and development firm that brings together top-quality research scientists with system and software engineers. Esail Cloud leverages accurate data to teach basic through advanced levels of tactical oceanography and integrates with learning management systems where scenarios can be practiced outside of scheduled simulation times. This allows more flexibility for those enlisted to learn and test their knowledge with or without instructors present. Simulating the acoustic environment offers a safe environment to test skills to ensure mission readiness. Learners can also revisit and relearn concepts. With excellent 3D acoustic modeling, Esail Cloud is an innovative and powerful tool for those who want the highest level of preparation and training with accurate acoustic modeling.

Technology Category Alignment:

Modeling and Simulation Technology
Advanced Electronics
Air Platforms

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SYSCOM: NAVAIR
Contract: N68335-19-C-0722

Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-19-C-0722

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2020-718

Topic # N182-119

Oceanography Tactics Training for Employment Readiness

ARiA

WHO

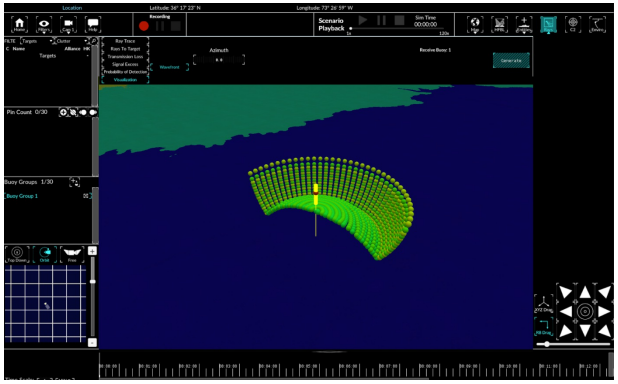
SYSCOM: NAVAIR

Sponsoring Program:

Transition Target: P8-A Integrated Training Center Naval Air Station Jacksonville, Florida, Naval Air Station Whitbey Island, Washington, and program offices PMA 205, which manages procurement, development, and fielding of training systems, and PMA 264, which manages Air ASW systems, and Boeing which develops the tactical training for the P8-A.

TPOC:
(407)380-4672

Other transition opportunities: Helicopter Maritime Strike Squadron, Training for Environmental Modeling on Surface Ships and/or Submarines.



WHAT

Operational Need and Improvement: Esail Cloud is an application that offers an innovative approach to oceanographic tactical training by offering accurate physics modeling with 2D and 3D simulations for instructors to build engaging multimedia scenarios. the Navy advocates building a capability that allows instructors to easily build training scenarios that are immersive and interactive physics-based animations and models. This type of modeling is complex, however, Esail Cloud makes the creation of scenarios easy to use and serves as a highly visual tool for learners using the crawl-walk-run approach as the application offers remediation and advanced skill training.

Specifications Required: Required Specifications include animations that pertain to the entire breadth of the oceanographic environment. The application includes both the ability to create animated training content and assessment points for knowledge checks. The content created through ESAIL Cloud offers dynamic forms of content including; charts, text, animated videos, graphs, and raw data.

Technology Developed: Our technology elegantly combines the complexity of teaching tactical oceanography with a thoughtfully designed interface that supports instructors. Esail Cloud offers the ability to create, examine, and explore oceanographic phenomena in 2D and 3D space as it relates to acoustics and anti-submarine warfare. The application allows instructors to design a scenario demonstrating one or more aspects of the physical and/or tactical environment by capturing the scenario and developing learning assessments.

Warfighter Value: Esail Cloud uses real data and real-world environments to compute, model, and visualize the oceanographic environment from the most basic principles of underwater sound propagation to a highly sophisticated level of applied acoustics in order to teach tactical oceanography. The application affords instructional scaffolding where instructional aids or supports are added until a level of domain mastery is accomplished. The importance of employment readiness is the end goal of our product and we know that practice in real-world simulated environments affords low-level risk and high reward by preparing the next generation of warfighters with innovative, engaging, and flexible learning tools.

WHEN

Contract Number: N68335-19-C-0722 **Ending on:** September 20, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Task II-1: Physical Modeling and 3D Visualization	Med	3D visualizations rendered and tested for accuracy	6	December 2020
Task II-2: Video, Interactive, and Moodle Lesson-Builder and Student-Evaluation Tools	Low	Video recorder implemented, recent version of Moodle instance installed, Moodle lesson builder components are enabled and tested	6	September 2020
Task II-3: User Interface and Usability	Med	Design iterations of user interfaces are developed in low and high fidelity and internally tested for usability	6	December 2020
Task II-4: Scalable Architecture	Med	Standardized programmatic remote procedure call, implemented containerized services and migration to microservice architecture	6	December 2020

HOW

Projected Business Model: Primary funding is through prime contracts from government agencies—focusing on the Department of Defense (DoD)—with secondary funding through R&D contracts with large firms in industry sectors ranging from aerospace to defense to social media. The second component is a software- engineering component leveraging IP from the R&D component toward the commercialization of signal-processing, sensor, and training technologies. Engineering in this component activity focuses on the advanced development of software modules such as middleware and executable libraries to be integrated into larger systems. Primary funding is through direct sales to a focused public-sector customer base with secondary funding though sales to the private sector. While the software-engineering component leverages the R&D component to seed new development, the R&D component leverages the software-engineering component to provide testbeds and prototypes that accelerate research.

Company Objectives: Applied Research in Acoustics will continue to develop this product as tactical oceanography training remains relevant to a broad audience within the Navy. We plan to expand the capabilities of this product by incorporating educational mini-games and continuing to refine our accuracy of 3D animations. Esail Cloud currently has the ability to accommodate both passive and active sonar.

Potential Commercial Applications: Our initial commercialization product will be a rapid-content-generation tool to output animated lessons and support capture of knowledge assessments for training Acoustic Sensor Operators in employment of advanced oceanography tactics for ASW. Transition for client-server configuration of ESAIL Cloud will be targeted toward Naval Air Station Jacksonville P-8A ITC and program offices PMA 205, which manages procurement, development, and fielding of training systems, and PMA 264, which manages Air ASW systems. The capabilities developed for ESAIL cloud have additional applications beyond training in tactical oceanography. The tools can be incorporated in larger scale tactical training provided in the ITC by the Mission Operator Part Task Trainer (PTT) and Weapons Tactics Trainer (WTT) that are developed by Boeing under an IDIQ contract to NAWCTSD. Similarly, ESAIL can be used as a TDA and MPT.

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