

# Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2021-0422

Topic # N18A-T014

Advanced Ship-handling Simulators

D'Angelo Technologies, LLC

## WHO

**SYSCOM:** NAVSEA

**Sponsoring Program:** PEO Ships / PMS 339

**Transition Target:** PEO Ships

**TPOC:**  
(202)372-5861

**Other transition opportunities:**

**Notes:** A retired US Navy Captain testing out the Advanced Shiphandling Training Developments and an example of VR Shiphandling Training



Image courtesy of D5T 2021 and <https://media.defense.gov/2018/Jul/02/2002377702/-1/-1/0/180702-N0443-0001.jpg>

## WHAT

**Operational Need and Improvement:** There is a need to create an automated, adaptive, real time coaching module for the purpose of accelerated instruction and improved positive transfer of learning for Surface Warfare Officers (SWOs). The current method of instruction relies on time consuming one-on-one instructor's visual observation of each student. Through the automation of the training and evaluation process SWOs will be afforded the opportunity to train more frequently and receive enhanced in-depth feedback to improve operations. D'Angelo Technologies is working to automate the evaluation and tutoring process to afford SWOs the opportunity to train without tying up an instructor. SWOs will be more skilled and competent handling ships and the frequency and risk of accidents during mission critical evaluations will be reduced.

**Specifications Required:** The Navy needs a training solution that develops open systems architecture software and algorithms to enhance the current Intelligent Tutoring System (ITS) for ship-handling simulators. This system needs to include adaptive coaching and an intuitive and easy to understand post evaluation in the form of an after action report.

**Technology Developed:** D5T created a suite of software in order to tackle the operational needs. These include:

- ConnFed: A data pipelining program that acts as the connection bridge between ITS software developed, D5T's Voice Commands Engine, and D5T's VShip Launcher
- Voice Commands Engine: A C#.NET app responsible for supporting all text to speech and speech to text functionality needed for the Ship Handler using the product
- VShip Launcher: A C#.NET app that provides a user friendly interface to interact with aforementioned D5T and VMASC software as well as GDIT's VShip software stack

**Warfighter Value:** This system will improve warfighter success. It will produce better trained Surface Warfare Officers who become more highly skilled and competent, it will improve mission success and it will reduce accidents due to improper or lack of training.

## WHEN

**Contract Number:** N68335-20-C-0321 **Ending on:** August 27, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Develop and Test Framework as a Component	Low	Framework functional when SME tests	3	February 2021
Implement Framework into System and Test	Low	Framework functions as a unit with COVE	4	March 2021
Incorporate Base Feedback and Optimize Framework	Low	System operates following optimization	4	May 2021
Expanded Algorithm Development and Integration	Low	SME positive testing feedback	4	October 2021
Initial integration of prototype framework at SWOS	Med	Integration, SWOS testing, positive feedback	5	February 2022
Transition and Delivery Plan	Low	Accepted transition and documentation	6	March 2023

## HOW

**Projected Business Model:** The algorithms developed will result in an autonomous agent that will integrate with the US Navy's COVE (Conning Officer Virtual Environment) and COVE-ITS (COVE-Intelligent Tutor System) to bring the user a more focused training simulation. Training programs in other fields will benefit from integrating an autonomous agent to help learning performance and skill development.

D5T envisions delivering the first product as a Navy specific training package tailored specifically to COVE. The first customer will be Surface Warfare Officers School. Additional customers include all Navy sites that implement COVE. The result of this effort are interactive training and gaming modules (including adaptive coaching, analysis, in-depth feedback) which can be used for any training application and gaming interfaces where participant interaction and simulation feedback is critical to the success of the exercise. D5T is the developer of this technology but will work with its commercial partner (GDIT) and the Navy to issue licenses and support contracts for continued implementation.

**Company Objectives:** Our ultimate goal is to integrate our work into the current SWO's training regimen by enhancing the Navy's ship-handling training simulators they already use. Removing instructor overhead during training of SWOs will translate into reduced time taken to produce a fleet of competent and qualified SWOs.

**Potential Commercial Applications:** The potential for commercial application would apply to advanced training systems for commercial industry. The marine, shipping, and cruise/tourism industries all utilize ship-handling simulators similar to the Navy's currently used technology, but also lack autonomous assessment capabilities. Reducing the need for instructors through improved system feedback is applicable to other Navy training environments as well.

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