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SBIR INVESTMENT: \$1,338,667

PHASE III FUNDING: \$33,435,921

DEPARTMENT OF THE NAVY

NAVY SBIR/STTR SUCCESS STORY



INNOVATIVE IMAGERY PROCESSING ARCHITECTURE

Oceanit developed a modern software processing architecture for multisensor imagery collected from tactical and national ISR assets that allows for insertion of new capabilities to meet next-generation sensor and warfighter capabilities.

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THE CHALLENGE

New intelligence, surveillance and reconnaissance (ISR) sensors are being developed that require specific processing of both real-time and post-mission sensor data at the tactical level. An innovative software architecture design for a common imagery processor was needed that would provide concurrent processing of National Imagery Transmission Format (NITF) frame, sweep, and full motion video, in standard and high definition, for wide area large format imagery. Through SBIR, the Navy sought a small business solution that would achieve this goal and develop an optimal hardware set that would process the ISR data for the list of candidate sensor systems.

THE TECHNOLOGY

Oceanit used NAVAIR Phase I and II funding to develop VIPA (versatile image processing architecture). VIPA is a software development platform for processing streams of data, with particular emphasis on manipulating images and extracting information from them. It provides an intuitive interface for creating applications that ingest, process, and display streaming audio, video, and image data, from a variety of sources. For the Navy, VIPA breaks complicated problems into components, which are linked into processing chains. On top of this foundation is a set of image processing functionality that is used to build the end-user ISR application.

THE TRANSITION

Oceanit was recently awarded a \$9.5M cost-plus-fixed-fee delivery order (N68335-19-F-0393) against a previously awarded basic ordering agreement (N68335-16-G-0028) in support of the deputy assistant secretary of defense for emerging capability and prototype technology, totaling over \$33M in Phase III revenue. This project focuses on the continued development of the Prototype Test Unit (PTU) sensor for integration, test and demonstration with a non-kinetic system. The PTU sensor incorporates the necessary hardware and software subsystems to demonstrate the viability of a novel defensive capability in an at-sea-demonstration aboard a Navy ship. This work is being performed in Honolulu, Hawaii. The Naval Air Warfare Center, Aircraft Division, Patuxent River, Maryland, is the contracting activity.

THE NAVAL BENEFIT

VIPA provides the warfighter with timely, accurate, and richly analyzed ISR data since the technology has over 400 modules for reading and writing data, interacting with hardware, manipulating color, detecting objects and motion, time domain filtering, mathematical operations, spatial transforms, plotting, audio processing and more. VIPA speeds the addition of algorithms and sensors, making the latest technology available as early as possible. This translates to better threat detection due to the advanced sensor systems installed on land, sea and airborne platforms. This system also supports both the high-speed demands of live streaming data and the high-volume demands of archival data processing. It provides detailed control of threading and supports parallel processing on a number of different levels.

THE FUTURE

While Oceanit is continuing its Phase III efforts with the Navy, they have also found success within the Department of Homeland Security's (DHS) SBIR program. The company is currently contracted with DHS to create a system that can reliably detect and correct sensor spoofing to minimize the number of false positives that reach operators, analysts and decision-makers. In other government opportunities, the Drug Enforcement Agency (DEA) could use this processor to process their EO/IR imagery of border areas and drug interdiction routes. The processor can track the movement of potential terrorist threats on our borders and those seeking to enter the country illegally through comparative imagery analysis. The use of a common processor to host and process ISR type data also has multiple applications in the private sector. The technology can be utilized in the management of the domestic power grid where thermal imagery of power lines can be processed and compared over time to identify insulator leaks and hot spots where energy is lost during transmission in order to determine where repairs are needed. Leveraging its expertise in sensors, Oceanit has also been laser-focused this past year on doing its part to combat the COVID-19 pandemic. In addition to an AI therapy it is developing in tandem with DARPA, Oceanit has also developed a rapid saliva-based test for COVID-19 called ASSURE with funding from the Office of Naval Research (ONR).