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Sediment Volume Search Sonar

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Summary

The Sediment Volume Search Sonar is a sensor whose goal is to improve buried unexploded ordnance (UXO) detection and classification performance through the design, build and demonstration of a sonar system that is deployed from a shallow-draft surface vessel. This sonar system produces a novel form of three-dimensional synthetic aperture sonar (SAS) imagery of surficial and buried UXO across a range of environments. The sensor is particularly suited for use in water depths less than 3 meters, and it provides sufficient detection and classification performance against objects of interest in water less than 5 meters depth.

The sensor's hardware design was based in part upon data created in a modeling and simulation collaboration with the Applied Physics Laboratory at the University of Washington. This collaboration produced synthetic sensor data where the sensor/environment/target space could be modified to explore the expected operating conditions. The simulated data were also used to adapt a set of existing signal processing algorithms for formation of three-dimensional acoustic imagery.

Recently, the sediment volume search sonar has been integrated to a shallow-water surface craft, and experiments have been conducted at a trial site in the Foster Joseph Sayers Reservoir near Howard, PA. This test site has been prepared with several buried man-made objects. Results will be presented showing the use of the sensor for detecting and localizing these objects.

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