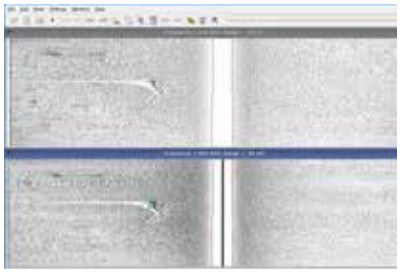
Automatic Contact Detection (ACD)

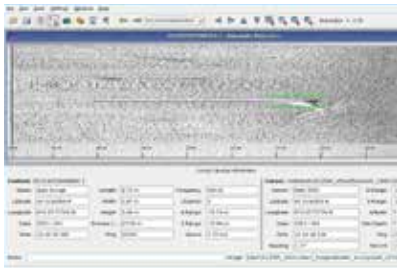
MARINE SURVEILLANCE AND RECONNAISSANCE. AUTOMATED, ACCURATE, AND EFFICIENT.

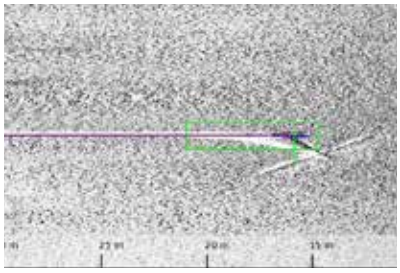
Side-scan sonar technology is used to locate objects on the seafloor during safety of navigation surveys, seafloor mapping, port security, and search & locate operations. However, objects or contacts must be identified by reviewing these data manually and typically post-mission, which is labor-intensive and delays production of usable information. To address this, Leidos researched methods to improve the efficiency of the contact identification process by focusing on automated detection and classification of contacts in side-scan sonar data.

REDUCES LABOR WHILE INCREASING DETECTION

The result is our Automatic Contact Detection (ACD) software. Fully integrated with our Survey Analysis and area Based EditoR (SABER) product, the ACD software automatically detects and measures bottom contacts in side-scan sonar data. ACD measures the dimensions of these contacts and uses neural network technology to significantly reduce the number of false detections presented to a reviewer. In studies, ACD combined a high likelihood for detecting an object on the seafloor (93 percent) with a low false detection rate (6 percent) using a properly trained neural net. This reduced the labor needed to review the data by as much as 25 percent and potentially enable near-real-time data processing in autonomous vehicles. Using ACD, Leidos can help protect those on the sea from dangers on the ocean floor.







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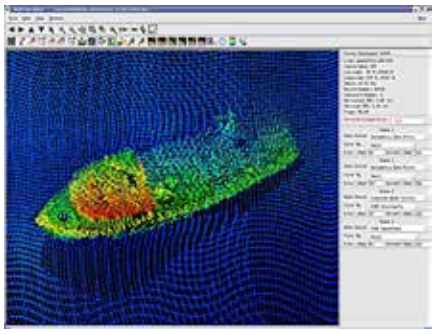
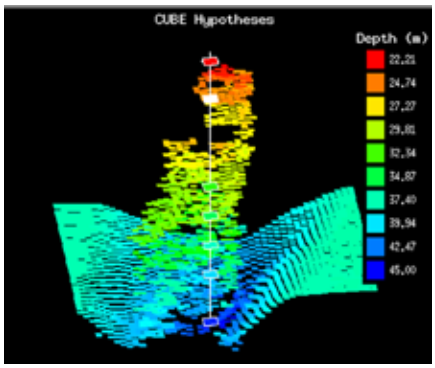
AUTOMATIC CONTACT REVIEW

- Automatic Bottom Tracking — Automatically correct bottom tracking in imagery data
- Automatic Contact Detection — Automatically detect contacts in imagery data
- Contact Review — Simple, straightforward user review of automatically identified and classified contacts
- Automatic Detection Classification — Train and apply a neutral network to reduce the number of false detections reported as contacts
- Imagery Review — Review side-scan data for overall quality and to correct bottom tracking issues
- Build Mosaics — Generate a gridded layer to review coverage extents and data quality





FULL INTEGRATION WITH SABER SOFTWARE

Leidos developed SABER to be a flexible and robust data processing tool for the maritime survey industry. This software efficiently and smoothly archives, displays, and processes large data volumes associated with hydrographic surveys.

- Editing, filtering, and smoothing of position data
- Correction for tidal variations, roll/pitch/azimuth offsets, and sensor mounting positions
- Recalculation of depth data for different sound velocity profiles
- Recalculation of multi-beam alignment calibrations for roll/pitch/azimuth offsets, transducer, and antenna mounting positions
- Area-based processing
- Total Propagated Uncertainty (TPU) estimation
- Combined Uncertainty and Bathymetric Estimator (CUBE) processing
- Area-based editing
- Ellipsoidal-reference survey support
- Data model in the form of Bathymetric Attributed Grid (BAG)

SYSTEM REQUIREMENTS

- Operating system: Red Hat® Enterprise 6/7, with all packages
- Display screen set to at least 1280 x 1024 at 24-bit depth
- Bash Shell

FOR MORE INFORMATION

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