Automatic Target Recognition (ATR)

Mine Detection

Integrated Performance

New sensor technologies deployed on off-board unmanned systems provide navies with improved imagery and data for the purposes of Mine Countermeasures (MCM). Improved sensor resolution has many benefits but also places a strain on operators due to the volume and complexity of the data to be analysed.

Typically, when performing Post-Mission Analysis (PMA) on data gathered by Unmanned Maritime Systems (UMS), a highly trained team of operators must analyse large volumes of data over long periods of time. The result has been an increase in the training necessary for operators.

To assist the operator, Automatic Target Recognition (ATR) is designed to detect mine-like objects from the sidescan sonar data. Further analysis provides a measure of how 'mine-like' each of the targets is and the operator may decide if the target is a mine or a false alarm. SeeByte's ATR uses fast, supervised classification techniques to classify shapes such as cylinders, wedges, and truncated cones, which provide a step-up improvement in processing speeds and results.

ATR System

SeeByte's ATR System is designed to provide a complete set of tools that fit into the PMA workflow, and is fully integrated into SeeTrack.

This integration allows the user to intuitively work with the output produced by the ATR.
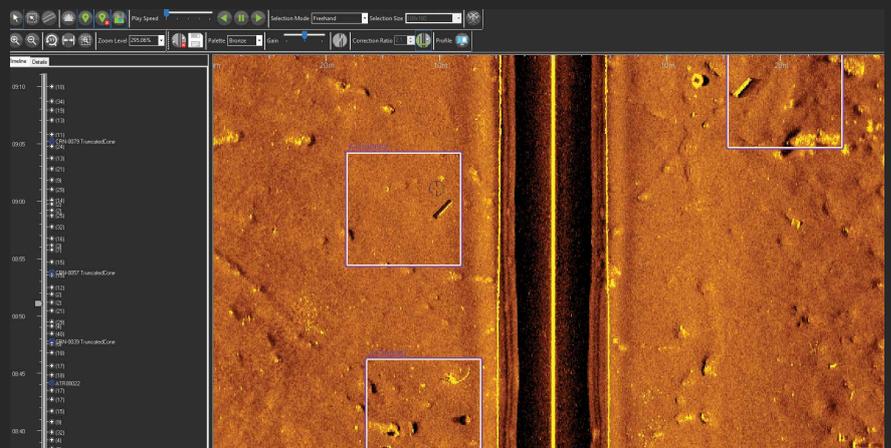
seebyte

A BATTELLE COMPANY

www.seebyte.com

Specifications

Core Features of ATR System:

- **ATR Algorithms:** Allows the operator to launch either an integrated SeeByte ATR algorithm or 3rd party algorithm, in a single workflow, to detect objects of interest.

- **Fusion Algorithm:** Allows the operator to run an algorithm to merge the detections generated by the ATR algorithms.

- **Terrain Complexity:** Different sea-floor terrains are presented within the data and a geo- referenced map is generated.

- **Mission Review Tool (MRT):** This tool is a companion tool to the IRT (Imagery Review Tool). The IRT presents a high definition waterfall display; the MRT provides the operator with multiple views of locations or contacts highlighted by the IRT.

- **Coverage Monitor Tool:** Allows the operator to visually assess the area that they have reviewed on the geo-referenced mosaic to avoid missing areas in the analysis.

- **Software Development Kit:** As an open service oriented architecture, it allows customers to plug their own ATR algorithms directly into the ATR system.

Minimum System Requirements:

ATR requires SeeTrack v4

- OS: Windows 7/10 (Pro 64-bit)
- Processor: Intel Core i5 (preferably Core i7)
- RAM: 4GB
- Graphics: 1GB RAM capable of Open GL2.0
- HDD: 10GB of free HDD space (preferably SSD)

Further Details

SeeByte's ATR algorithm is integrated with SeeTrack and the US Navy's Common Operator Interface Navy (COIN).

The Performance Analysis Training Tool (PATT) module provides training and evaluation of both ATR models and operators.

The ATR algorithm can also be provided as a real- time embedded module, typically run with Neptune.

PMA coverage shown as overlay (green) for quick reference
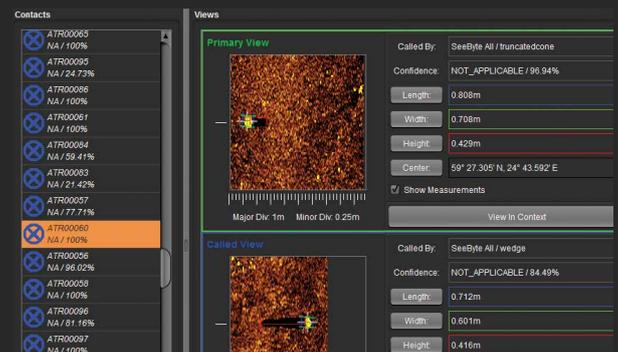
Mission Review Tool with multi-view