AutoTRap ONBOARD®

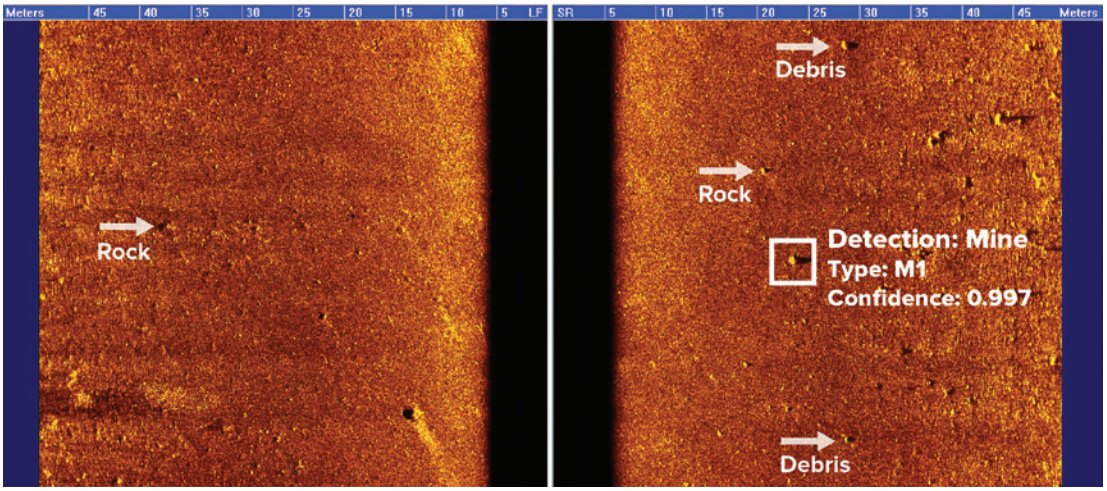
The AutoTRap Onboard® automatic target recognition (ATR) app empowers your autonomous underwater vehicle (AUV) to act on side-scan sonar data in real time. When AutoTRap Onboard recognizes objects on the seafloor, your AUV can investigate further on its own—there's no need to surface, review data, and re-deploy it with a new mission.

AutoTRap Onboard has been developed, tested, and deployed on the market-leading Teledyne Gavia line of AUVs, and is extensible to other sonar systems and platforms, including towed sonar systems.

Product Capabilities

Deep learning for side-scan sonar data

AutoTRap Onboard applies recent advances in deep learning object detection and representation to locate and classify objects in side-scan sonar data.



When objects are detected, AutoTRap Onboard provides contact alerts to your system.

Target detector and target classifier – Locates and recognizes objects of interest—in real time. Without accurate object detection and classification, your team must manually analyze sonar data, which can be time consuming and error prone. AutoTRap Onboard has demonstrated excellent detection rates and false positive rates; for example, identifying truncated conical objects on a rocky volcanic seafloor with a 90% probability of detection.

Target library – Contains objects of interest on which AutoTRap Onboard has been trained. The AutoTRap Onboard architecture supports a wide range of potential targets—mines, shipping containers, pipelines, human forms, and more. To provide highly accurate detection and classification of new objects not in the current library, Charles River Analytics provides services to train AutoTRap Onboard on new targets.

Real-time contact alerts – Provides the object's type, confidence of detection, and position to any downstream system, such as your vehicle's navigation and control or mapping software.

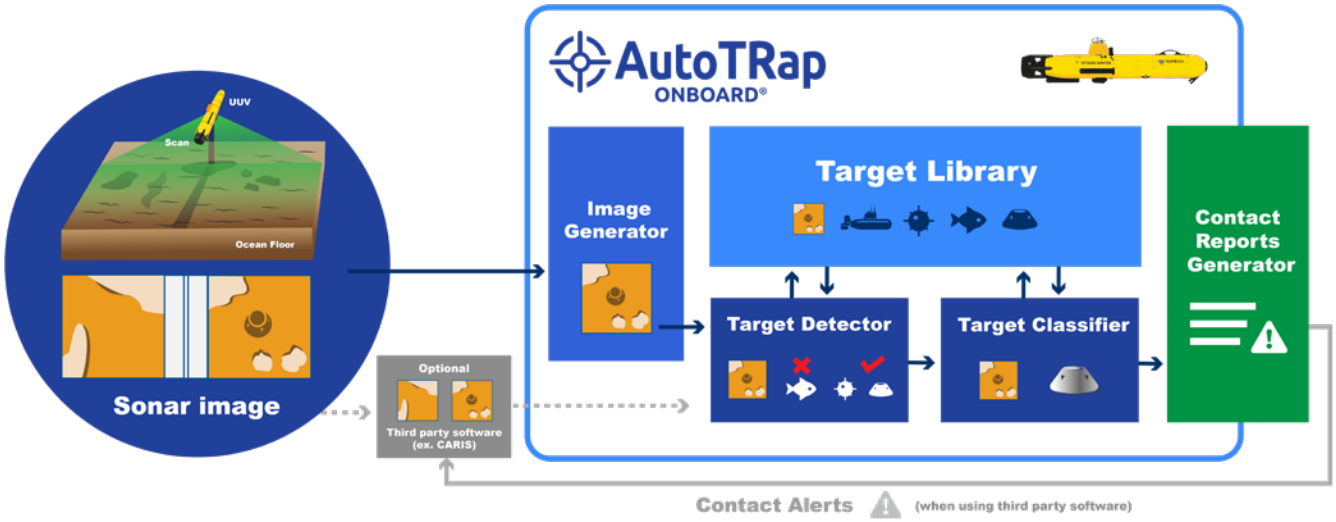
AutoTRap Onboard's architecture supports the detection of shipping containers, oil pipelines, human forms, black boxes, and more.

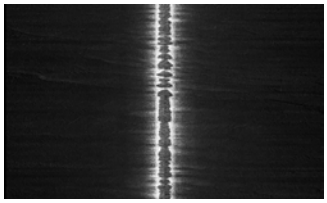
Product Advantages

Empower your vehicle to make real-time decisions

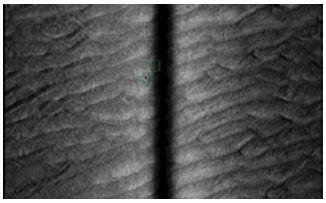
AutoTRap Onboard® supports real-time autonomous behavior for mission operations or command and control.

- **Enhanced autonomy** – Without real-time object detection, your AUV just collects sonar data and returns it to the surface for analysis. To take action on the data, like rerouting to perform a closer inspection, your team must repeat the launch and recovery process. With real-time detection, your AUV's navigation and control software is empowered to make more effective decisions—on its own.
- **Reduced deployment cost and time** – With real-time detection, your AUV can accomplish more complex mission goals in a single deployment, reducing mission cost and time.
- **Increased mission resilience** – In unfavorable environmental conditions such as rough seas, deploying your AUV can be challenging. Reducing the number of launch and recovery cycles means you can save power and search a wider area and enables you to better plan your mission against environmental factors.





Third party software



AutoTRap Onboard

AutoTRap Onboard's Image Generator automatically delivers higher fidelity seafloor images from raw sonar data.

Technical Requirements

AutoTRap Onboard v1.1 works out of the box to detect certain objects on the Teledyne Gavia platform and can be extended to detect other objects and work with other platforms and sonar systems.

- **Windows® 7, Windows® 10 operating system**
- **Intel® Atom E3845 or better**
- **EdgeTech 2205 sonar with 600kHz side scan frequency**

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Autonomy you can trust

Charles River Analytics uniquely combines agile innovation and leading-edge research with a decades-long track record of hardened engineering in austere environments to create best-in-class solutions to diverse, challenging problems.

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