Automated Target Recognition Options for Gavia Vehicles

Teledyne Gavia, a global leader in the manufacture of autonomous underwater vehicles (AUVs), has introduced Charles River Analytics' AutoTRap Onboard AI-based object detection software as a new capability onboard their Gavia marine vehicles. As underwater operations become more complex and dangerous, AI technology has emerged as the clear solution for delivering the consistent and accurate results that have proven elusive until now, due to the challenges of ever-changing marine environments.

The new partnership with Teledyne Gavia expands the boundaries for underwater unmanned sonar operation. Now, operators can acquire Teledyne Gavia's best-in-class unmanned underwater vehicles with AutoTRap Onboard software inside.

"AutoTRap Onboard automatically detects and identifies target objects in real time," said Dr Arjuna Balasuriya, senior scientist at Charles River Analytics. "This product saves time and money – operators don't have to bring the vehicle to the surface, download its data, and then send it back down for further investigation (if necessary). With Teledyne Gavia, we offer our customers a better experience, giving them confidence that the area is clear and it's safe to operate."

Bob Melvin, vice president of engineering at Teledyne Marine Systems, added: "Our customers have been asking us for a reliable way to carry out seafloor surveys, such as mine hunting. AutoTRap Onboard makes finding these targets of interest much easier and builds higher levels of confidence in AI systems."

Teledyne Gavia Offshore Surveyor equipped with AutoTRap Onboard.

Detection Rates

In environments that are challenging for target detection, AutoTRap Onboard has demonstrated excellent detection rates and false positive rates, identifying truncated conical objects on a rocky volcanic seafloor with a 90% probability of detection.

AI software must perform as expected despite constant variations in the deployment environment. AutoTRap Onboard has been designed with a versatile architecture that is robust across different environments, new sensor types, and changing mission goals. AutoTRap is part of the rich suite of ATR products offered by Charles River Analytics.

"Our commercial partners and customers – like Teledyne Gavia – have various autodetection and recognition needs. Some must locate and classify objects on the seafloor (e.g. shipping containers lost at sea), while others must find or track objects on the ground, in the sky, or in space," explained Dr Elaine B. Coleman, vice president of commercialization at Charles River Analytics. To detect the wide range of objects relevant to ocean surveys, AutoTRap Onboard can learn new objects by training on new target profiles as they are added to the target library.

A Teledyne Gavia prepared for testing with AutoTRap Onboard at Ashumet Pond in North Falmouth, Massachusetts.