

# Collaboration Improves Cooperation of Marine Autonomous Systems



SeeByte and MIT (CSAIL) are working together to improve the transfer of autonomy research and development between different autonomy systems. Currently users of one autonomy system, including the architecture and messaging middleware, are limited in their ability to utilise an alternative system. SeeByte and MIT will enable greater flexibility for their customers and collaborators to select the most appropriate autonomy system.

MOOS-IvP is a set of open source C++ modules for providing autonomy on robotic platforms, in particular autonomous marine vehicles. The project is situated at MIT and is widely used in research programmes worldwide.

SeeByte's Neptune provides a payload control architecture, goal based mission planning, and real-time autonomy engine for Unmanned Maritime Systems (UMS) to plan and execute autonomy behaviours for both single-vehicle and multi-vehicle missions. Neptune has been used operationally by various Navy customers including in the US, Canada and the UK.

## Collaboration Between Autonomy Systems

In order to provide users of both systems with flexibility, SeeByte and MIT will develop technical approaches to allow improved cooperation and collaboration between these autonomy systems. This is in direct response to customer requests as autonomy research programmes become larger and more complex, and as customers wish to transfer the output of their R&D activities into an operational environment. In particular a common theme has been the transition from MOOS-IvP to Neptune for use in higher TRL activities.

Mike Benjamin, research scientist at MIT CSAIL, said that one of the primary goals, beyond educating new students in marine autonomy, is to enable the ideas developed in MOOS-IvP to have an impact in real fielded systems beyond research prototypes. Working together in this effort promises to open a new avenue for bridging new novel capabilities in MOOS-IvP to Neptune and its users.