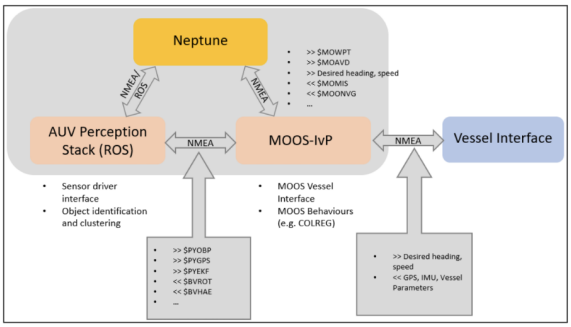
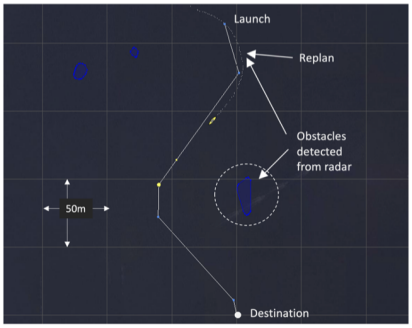
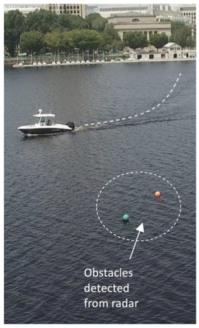
Multi-Architecture Autonomy (MOOS-IvP and Neptune)

Research in marine autonomy has traditionally involved development around a single autonomy architecture. Even when an architecture is open and modular, modules are typically all integrated into a single architecture. In this joint project Seebyte, an approach is considered that couples two distinct and mature architectures into a single combined autonomy system that leverages the strengths of both singular architectures to produce a more complete and capable system. In the first phase, the two autonomy architectures, SeeByte's Neptune, and MIT's MOOSIvP, are combined via a shared interface to leverage SeeByte's mission path-planning and exclusion zone capabilities along with the reactive path execution with obstacle and collision avoidance behaviors of MOOS-IvP. Results from simulation were replicated with on-water tests held on the Charles River in Cambridge MA during July 2021. The Neptune/IvP combined system was deployed on MIT's autonomous Boston Whaler and used to perform a safe crossing in a busy and dynamic environment.







Status:	Ongoing since Sept 2019
Sponsor(s):	ONR Code 32 / SeeByte, Ltd
People:	Mike Benjamin (PI), Mike DeFilippo, Conlan Cesar
Robots:	https://oceanai.mit.edu/pavlab/philos
Software:	MOOS-IvP public codebase, MOOS-IvP-Pavlab codebase
Photos:	https://oceanai.mit.edu/media/Jul2721-MIT-NeptuneTests/album

Recent Publications

2021 (1 item)

1. Conlan Cesar, Benjamin Whetton, Michael DeFilippo, Michael Benjamin, Michael Sacarny, Scott Reed, and Andrea Munafo. Coordinating multiple autonomies to improve mission performance. In *OCEANS 2021 MTS/IEEE*, October 2021.

References

[1] Conlan Cesar, Benjamin Whetton, Michael DeFilippo, Michael Benjamin, Michael Sacarny, Scott Reed, and Andrea Munafo. Coordinating multiple autonomies to improve mission performance. In *OCEANS 2021 MTS/IEEE*, October 2021.