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 MOOS-IvP, 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

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References