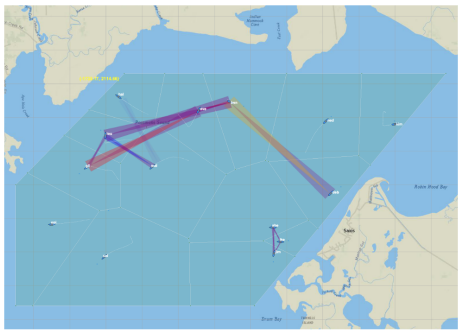
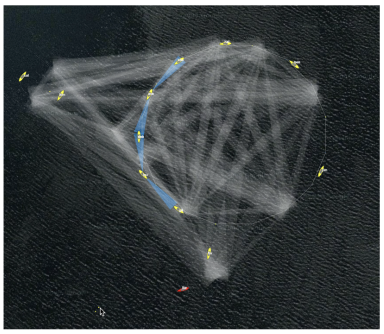
The MOOS-IvP Swarm Toolbox

The Swarm Toolbox is an extension of the MOOS-IvP public codebase containing a set of prototype libraries, MOOS applications and Helm behaviors with the focus on set of multi-vehicle, i.e., swarm, missions, and methods for decentralized task allocation. The toolbox also contains several logistic utilities for managing and operating large numbers of vehicles including (a) automated distributed software version control, (b) mission launch and health status monitoring, and (c) post-mission automated collection of mission log files and archiving. The primary mission focus areas are (1) large area distributed mobile sensing, (2) swarm defense of a high-value asset, and (3) multi-vehicle linear convoying. The toolbox also contains a prototype variant of the conventional MOOS-IvP simulator for enabling simulation up to 400x real-time per vehicle. This project has high overlap with the MTASC project which emphasizes the hardware aspect of swarm simulations.


Status:	Ongoing since August 2019
Sponsors:	MIT Lincoln Laboratory
Prior Sponsors:	NASA, DARPA, Lockheed Martin, Vecna Robotics
People:	Mike Benjamin (PI), Supun Randeni, Tyler Paine
Software:	MOOS-IvP public codebase, MOOS-IvP Swarm Toolbox
Robots:	https://oceanai.mit.edu/pavlab/robots/herons
Other Hardware:	https://oceanai.mit.edu/pavlab/proj/mtasc
Related Projects:	Manatee, MTASC, Sea Train

Recent Publications

2021 (1 item)

1. Michael Benjamin, Tyler Paine, and Supun Randeni. Autonomy algorithms for stable dynamic linear convoying of autonomous marine vehicles. In *OCEANS 2021 MTS/IEEE*, October 2021.

2020 (1 item)

2. Michael Benjamin. Multi-agent tactical autonomy simulation cluster (mtasc). 2020 End of Year Report, December 2020.

References

[1] Michael Benjamin. Multi-agent tactical autonomy simulation cluster (mtasc). 2020 End of Year Report, December 2020.

[2] Michael Benjamin, Tyler Paine, and Supun Randeni. Autonomy algorithms for stable dynamic linear convoying of autonomous marine vehicles. In *OCEANS 2021 MTS/IEEE*, October 2021.