The MIT Sea Scout Autonomous Underwater Vehicle (AUV)

The MIT Sea Scout Autonomous Underwater Vehicle (AUV) is an autonomous system aimed at accelerating AUV research and education. It has a simple design which is grounded in commercially available low-cost components and custom components which support multiple modes of manufacturing (i.e. SLA printing, urethane casting, injection molding, and CNC subtractive manufacturing). With this, a common recipe and supply chain can produce similar vehicles which can proportionally scale meet the needs of more advanced research objectives, challenging environments, or budgetary requirements, without design changes. In addition to this, it features a modular nosecone and sequential coupling system such that the core vehicle can readily be extended upon a simple communication and power distribution bus which is built into simple coupling flanges. Any number of payloads can be combined once developed independently under the communication and power distribution schema, with all other practical considerations.

The hull and couplers feature optional 8020 rails to mount payloads or support in ballasting, a removable mast, and swappable/adjustable fins. With this, the vehicle can uniquely reach an outer diameter less than 4.5" OD, with the three-axis Trident series of tailcone designs. Swappable fins allow users to adjust control authority of the vehicle to improve maneuverability or maintain a vehicle in which the fins reside within the 4.5" OD profile, without opening the vehicle.

Each payload can be pulled from a shelf and integrated into a vehicle minutes before a mission. A user can receive four connectors, two couplers, and include any payload which supports their research between, without needing to revisit AUV design. Future work with this platform includes, but is not limited to; AUV swarming autonomy, AUV networks, adaptive controllers, and cross-media collaboration between UAV's, USV's, and AUV's.

Dimensions (min)(LxD):	38" x 4.5"
Weight (min):	18 lbs
Depth rating (est):	150'
Frontseat computer:	Raspberry Pi 4 + Navigator Flight Controller
Thruster:	M200 Motor with custom propeller

Status:	Ongoing since Jan 2024
Sponsor(s):	Saab
People:	Ray Turrisi (Lead), Sam Huang, Mike Benjamin (PI)
Software:	MOOS-IvP public codebase, ROS2