



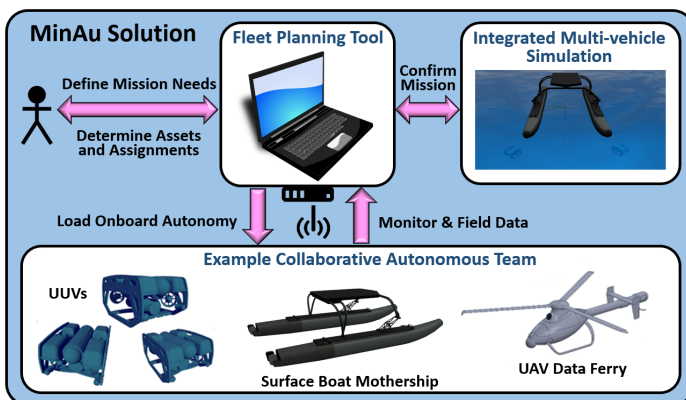
MinAu

Multi-Domain Multi-Asset Collaborative Autonomy

The **MinAu Planning System** is an advanced multi-vehicle mission planning, scheduling, and response system for the maritime environment that incorporates initial automated route planning and sensor tasking with autonomous onboard response systems. Orbit Logic and the Research and Engineering Center for Unmanned Vehicles (RECURV) at the University of Colorado and the University of California at San Diego (UCSD) have integrated COTS software with current research in unmanned systems to develop an architecture capable of supporting cooperative operations for groups of assets with varied capabilities and available sensors. This includes a unique data-sharing solution that allows efficient communication between assets while respecting the onboard capabilities of each asset.

Maritime Expeditionary Robots (HAMMER) system – consisting of SeaRover UUVs for collaborative ocean floor bottom mapping, a USV Surface Craft to act as a mothership for UUV deployment and recovery, and a rotorcraft UAV used as a data ferry to communicate data between the UUVs and the mothership. MinAu is capable of initial mission planning and scheduling for this system, including route planning and sensor tasking for the underwater vehicles to support cooperative mapping of a specified area and periodic surfacing for communication with the data ferry asset.

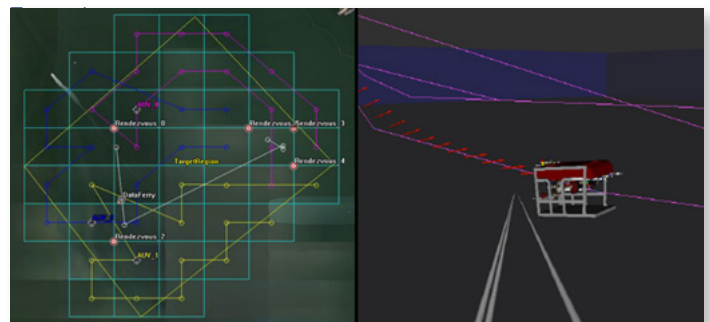
System-Level Process Flow and Data Exchange



MinAu addresses the current need for mission planning with autonomous, cooperative, multi-vehicle systems in dynamic environments with a combination of comprehensive up-front mission planning and onboard autonomous response capabilities. Initial planning outputs collection route plans and schedules for all assets, and the onboard Autonomous Planning System (APS) allows reactions to new information or adverse conditions encountered during the mission (water currents, degraded communication capabilities, etc.), including communication with other assets to assist in any planned response.

The MinAu solution includes collaboration with Space and Naval Warfare Systems Command (SPAWAR) in San Diego. Our system is being integrated with their Heterogeneous Autonomous Mobile

Area Target Gridding, Collection Planning, and Simulated



The same type of multi-asset collaborative autonomy deployed for MinAu autonomous planning for heterogeneous assets in any domain. Orbit Logic technology has also been applied to constellations of Low Earth Orbit (LEO) imaging satellites; fleets of rovers, satellites, and atmospheric vehicles for robotic Mars exploration; heterogeneous robotic swarms with astronauts-in-the-loop for Lunar exploration with NASA; and constellations of satellites that reconfigure their formation based on mission needs.

MinAu Onboard Dynamics Testing with BlueROV2

