

Assets & Competencies

Primary Hardware Platforms

Wave Adaptive Modular Vessel (WAM-V)

- 16" autonomous surface vessel
- 230 lb-thrust holonomic propulsion system
- Two degree-of-freedom manipulator



Unmanned Port Security Vessel (UPS-V)

- Custom 6.6" autonomous surface vessel
- 110 lb-thrust differential-drive propulsion system



Other Platforms

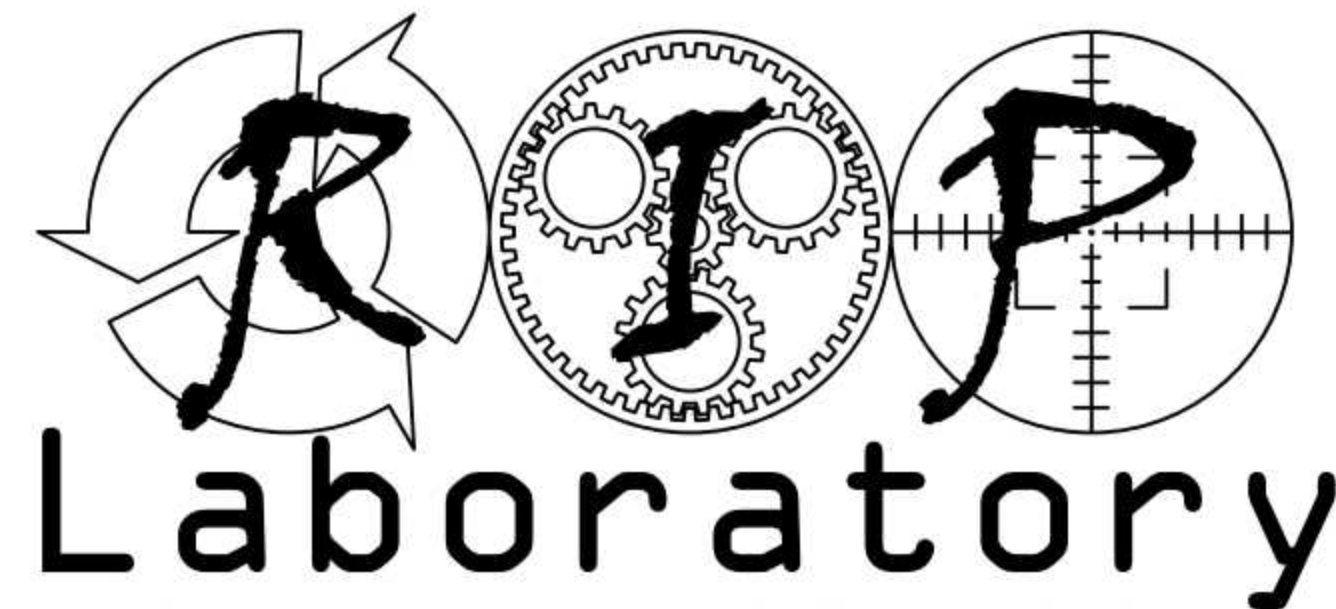
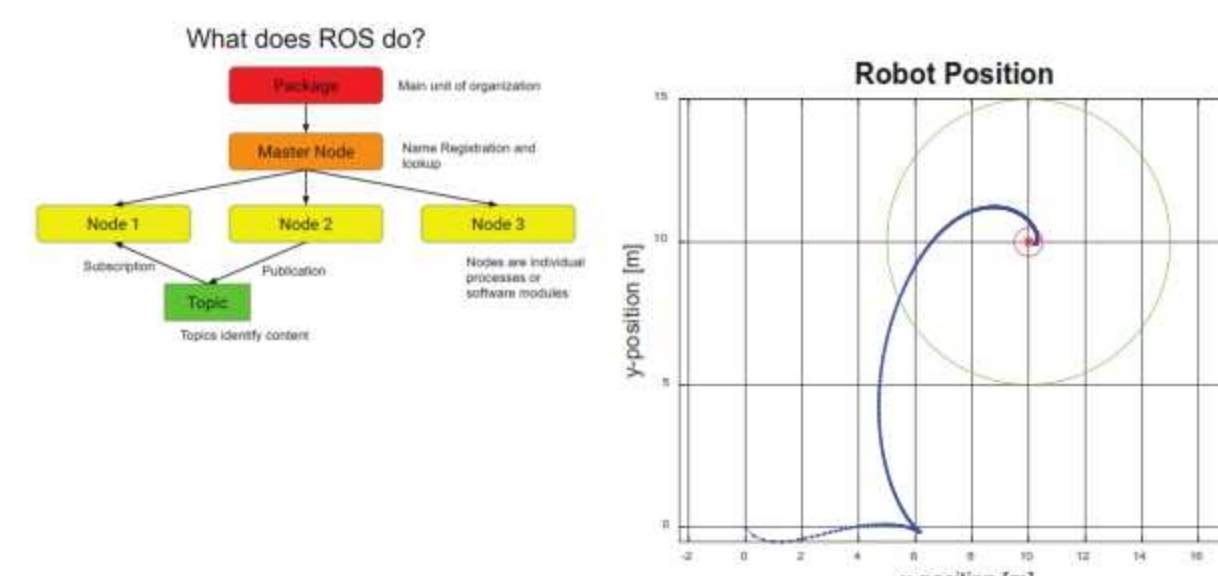
- ASV: Liquid Robotics Wave Glider; custom 4" catamaran; iRobot Seaglider.
- AUV: Remote Environmental Monitoring UnitS (REMUS); MBARI glider; Thunder Tiger; OpenROV

Instrumentation

Light Detection and Ranging (LiDAR); Image Recognition; Acoustic Detection; Doppler Velocity Log (DVL); Global Positioning System (GPS); Inertial Measurement Unit (IMU); Wireless Communications

Software Development

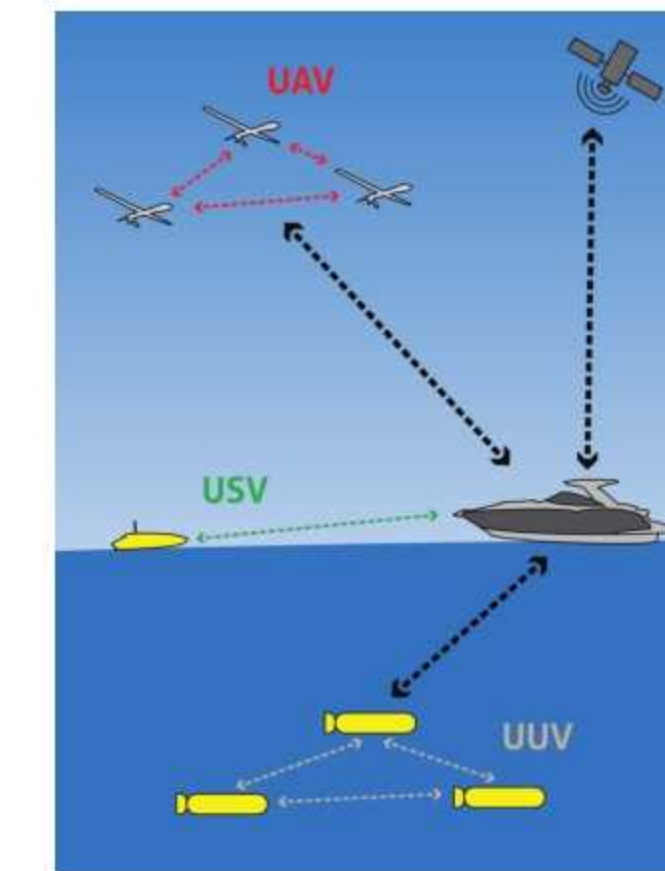
Robot Operating System (ROS)+Matlab
Simultaneous Localization and Mapping (SLAM)
Sensor Fusion (SLAM/LiDAR+IMU+GPS)
Finite State Machine (FSM)



Renewable Energy Industrial Precision Automation Engineering

<http://rip.eng.hawaii.edu/>

Principal Investigator: A Zachary Trimble
Research Assistant: Brennan Yamamoto



Future Research

Swarm Robotics

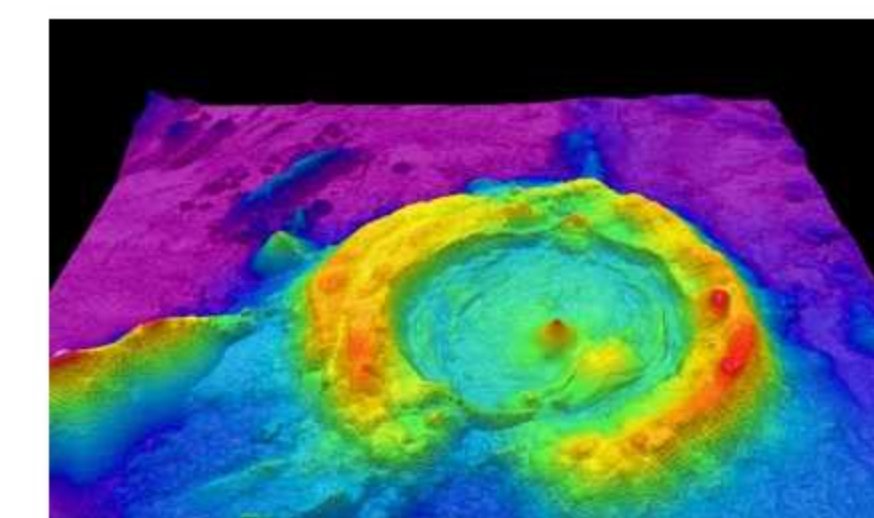
- Cooperative Localization
- Multi-domain robotics
- Autonomous reconfiguration
- Implicit, decentralized autonomy
- Swarm and agent motion coordination

GPS-Denied Environments

- Error bounding
- Attenuated communication
- High-resolution underwater laser imaging

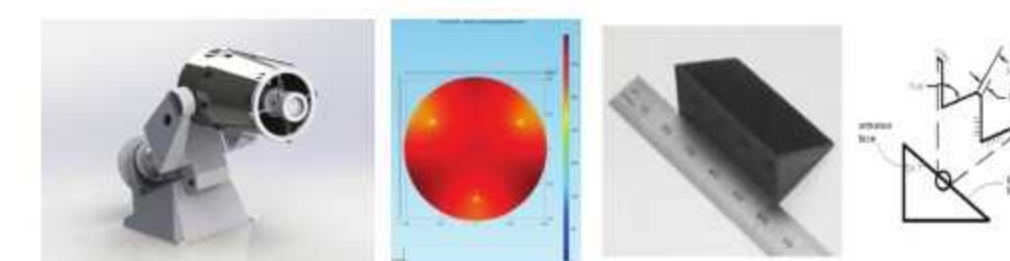
Cost-Conscious Robotics

- Solid-state LiDAR
- Stereoscopic camera & radar-based ranging
- Renewable energy integration



Courtesy of: National Oceanic and Atmospheric Administration

Other RIP Lab Research



Astronomical Instruments



Renewable Energy & Energy Storage



Industrial Automation & Manufacturing

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Thank you sponsors!

