NSF:NRI: FND: Extending Autonomy in Seemingly Sensory-Denied Environments Applied to Underwater Robots

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FIU Engineering & Computing

Challenge

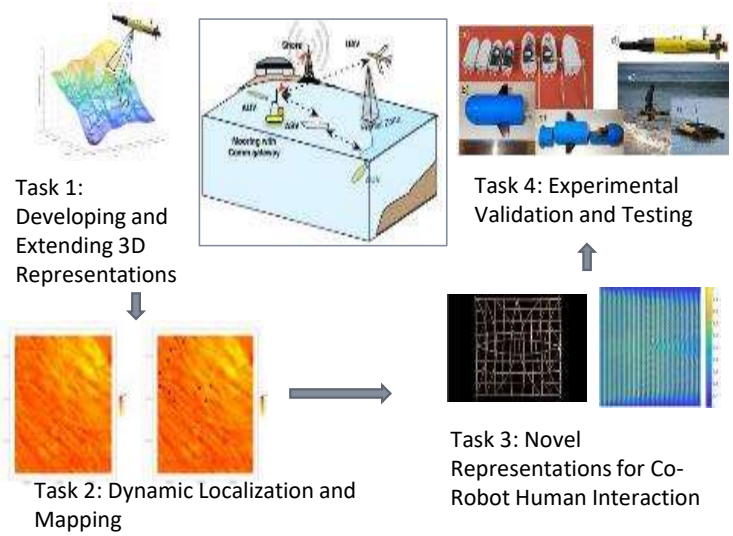
Overcome the theoretical and technical barriers to performing intelligent sampling in a sensory-denied, spatiotemporally dynamic environments focused in the aquatic domain.

Solution

Enable accurate localization for navigation within dynamically-evolving environments

Demonstrate the utility of novel representations (e.g., maps of environments) for planning on-board and between humans and robots

Experimentally validate research outcomes through simulations, laboratory tests, and field trials.



Enabling accurate localization and navigation using novel strategies and map representations that enable effective human-robot communication and targeted intelligent sampling.

FIU Institute of Environment

Scientific Impact

Novel strategies for autonomous robots to perceive the surrounding environment and enable navigation devoid of a geographical reference model in dynamically evolving environments.

Examine and Implement alternative approaches to map representation, localization, navigation, enabling effective robot-human communication that can be applied broadly to mobile robot systems.

Broader Impacts

- **High-impact applications:** Scientific advances in this project will enable cost-effective data collection for many important applications, including the assessment of reef ecosystem health and algal bloom monitoring.
- **Research Involvement from Underrepresented Groups:** Undergraduate students from historically underrepresented groups involved in cutting-edge robotics research.