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Multirobot Temporal Logic Optimal Control

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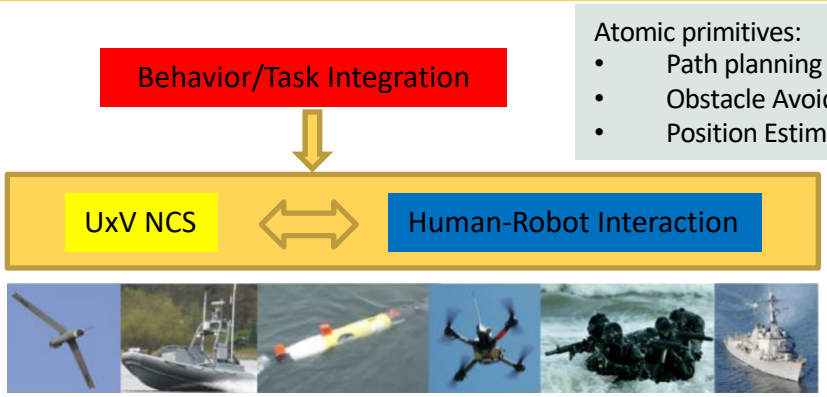
Behavior Automation for UxV Networked Control Systems

CRUSER
Consortium for Robotics and Unmanned Systems Education and Research



- Hierarchy Protocol – manages vertical conflict resolution
- Priority Protocol – manages horizontal conflict resolution
- Behavior Tree manages execution

Components for Behavior Automation of a UxV NCS

Problem Statement

- **With a hybrid autonomous/semi-autonomous UxV Networked Control System is it possible for rapid integration of user-defined behaviors?**
- **How to define abstract behaviors for a UxV NCS?**
- **How to simultaneously retain system performance while integrating many potential behaviors?**

Candidate Solutions:

- **AI/ML Behavior Trees and Robust Logistical Dynamic Systems**

Impact

- **The ability to rapidly integration horizontal and vertical behaviors offers the potential to rapidly increase autonomy in UxV NCS.**
- **While designed initially for expeditionary forces this applies to a wide set of DoD missions.**
- **Abstract behavior with UxV NCS specification permits permits independent behavior development.**

Transition

- **USSOCOM is aggressively looking at integrating UxV NCS into Special Operations missions**
- **PMS-406 Unmanned Systems has a variety of systems that can be combined to form an UxV NCS to improve a wide selection of maritime mission objectives**
- **USMC is actively pursuing UxV teaming for expeditionary mission objectives**

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