MINES Robotics

Interfaces & Architectural Mechanisms for Multi-Robot Control

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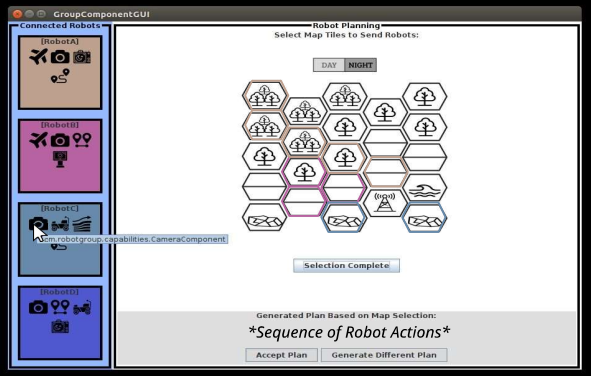
Robot teleoperation can enable (1) direct user control of robot planning and actions and (2) researchers to quickly and easily conduct studies with robots.
Robots usually come with an out-of-the-box teleoperation interface, or users may opt to create a custom interface.
However, these **interfaces *typically* focus on single robot or swarm control**.
Thus, there is a need for **multi-robot control interfaces that can enable users to monitor and control heterogeneous robot groups**.
As such, through an **iterative design process along with conducting user interviews and testing**, we are working on the implementation of the following interfaces and architectural mechanisms for multi-robot control.

Multi-Robot Capability-Tracking & Planning

In dynamic, potentially high risk settings, having a means of providing high-level group goals to multiple robots can enable a teleoperator to quickly adjust a robot group's set of actions.



-Architectural component tracks robots & capabilities.

-Interface dynamically updated by architectural component as robot components connect and disconnect.

-Interface offers **interactive map** for users to **send info to a planner** to generate robot area assignments & actions.

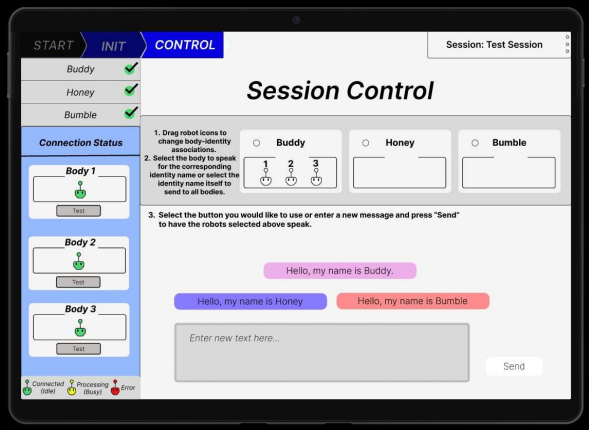
Multi-Robot Identity & Speech Control

In social settings, the presentation of robot identity can help indicate who/what humans are interacting with & shape interaction dynamics. Controlling that presentation can be difficult when there are multiple robot identities/bodies & when identity is dynamic.

-Architectural component tracks robot bodies & identities.

-Interface **enables users to create** (1) **custom robot identities** with unique names & behaviors & (2) **custom speech buttons**.

-Interface offers **control of the associated identities & speech output** of multiple robot bodies.



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