Section 4: ROS Parameters and Heading Controller Gain Tuning

AA274A - Principles of Robot Autonomy I

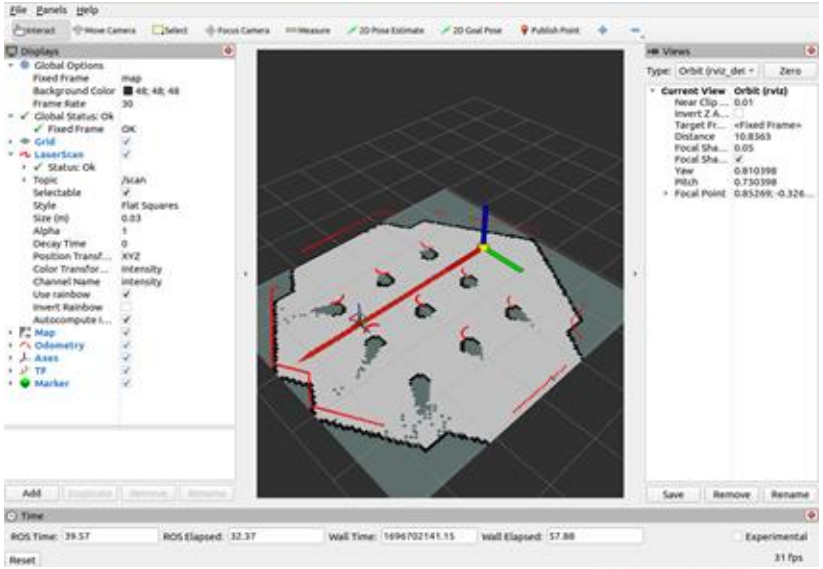
Week 4 – Autumn 2026

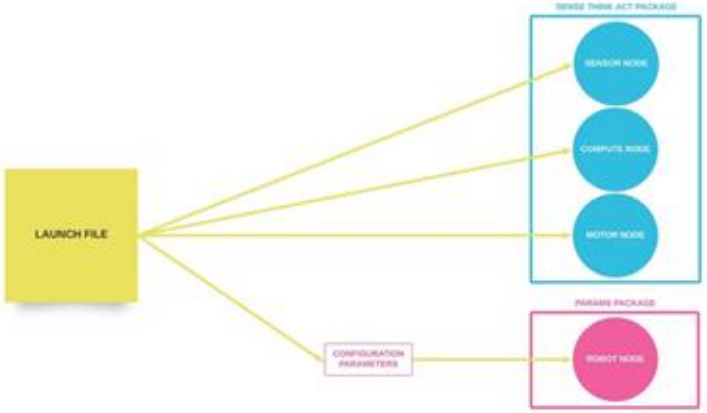
Section Attendance



Recap

- RViz: 3D visualization tool that visualizes information which otherwise would not even be parsable.
- Launch files: Simplifies the running of complex systems with many nodes and specific configuration details.





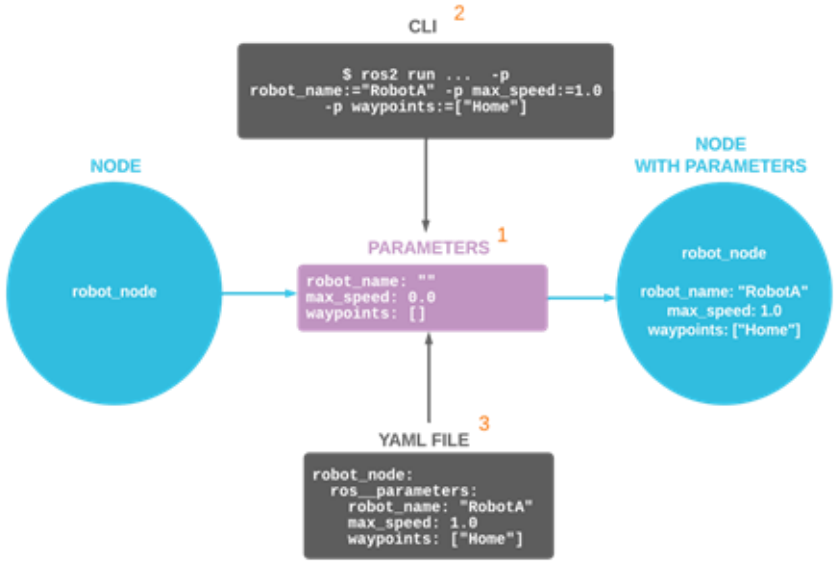
Today

- Learn how to use ROS Parameters.
- Apply heading controller on the actual robot!



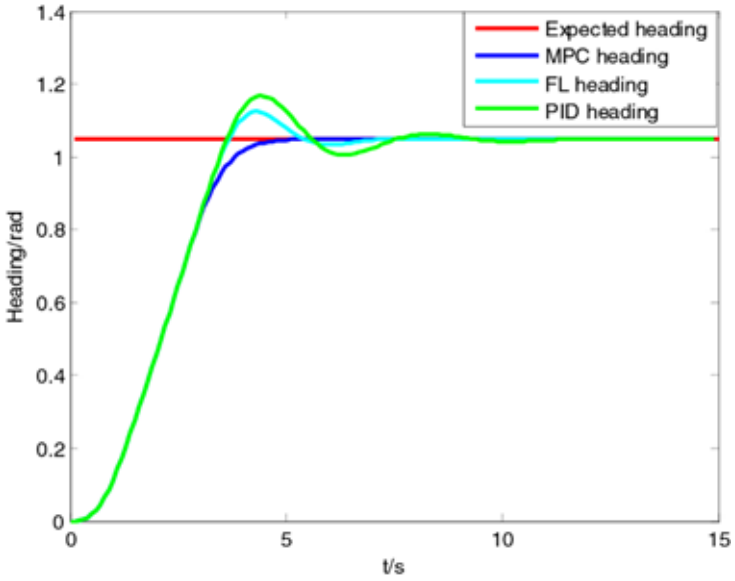
ROS Parameters

- Can think of it as node settings.
- Used to configure nodes at startup and runtime without changing the code.
- Can be stored as integers, floats, booleans, strings, and lists.
- Consists of a key, a value, and a descriptor.
- Can be set through the command line or a YAML file and accessed by a node.



Heading Controller Gain Tuning

- We implemented a proportional controller in HW1.
- The controller minimized the error between the current heading of the turtlebot and a desired goal heading in simulation.
- We will be running that code on a physical robot.



Switching around roles within groups

- Switch around who is inputting commands on the laptops – muscle memory for commands is important!
- ROS-related questions could be part of the midterm