

Section 3: Visualizing information with RViz and launch files

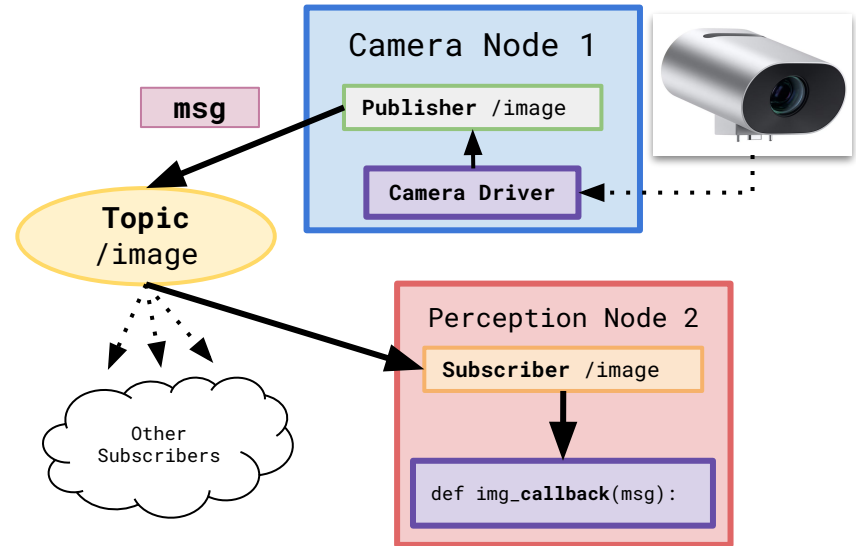
AA274A - Principles of Robot Autonomy I

Week 3 – Autumn 2023



Recap

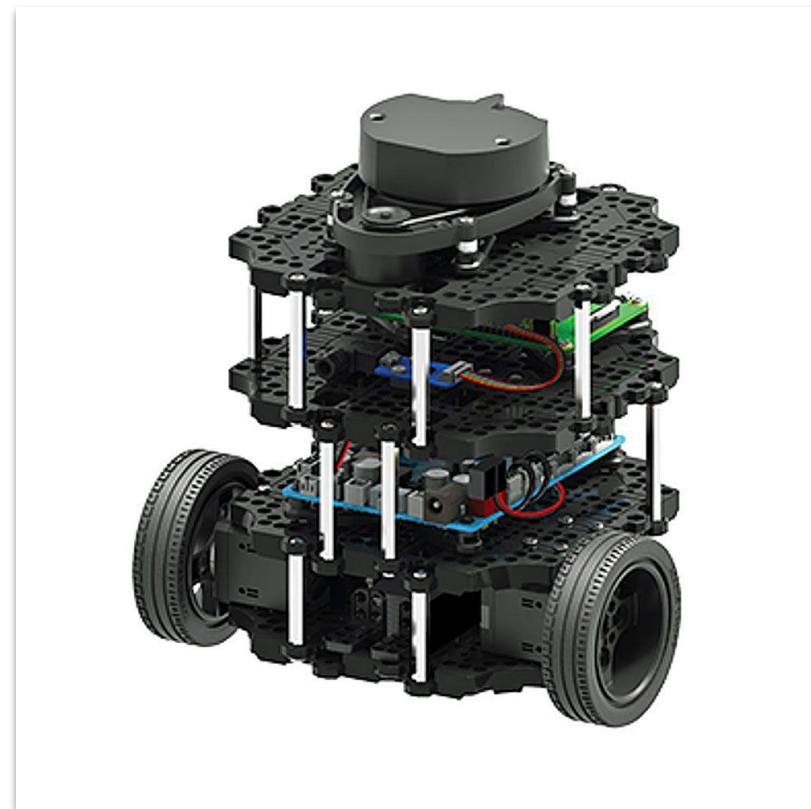
- ROS development environment: workspaces, packages, CMakeLists.txt, package.xml
- ROS programming basics: nodes, topics and messages, publishers and subscribers.



```
~/tb_ws/ # My group's workspace root directory
build/   # Compiled libraries
install/setup.bash # Source workspace packages
src/     # Top-level package directory
  external_pkg1/ # Some external package that I am using
  external_pkg2/ # Another external package
  group4_repo/  # My group's autonomy repository
  navigation_pkg/ # My group's Navigation ROS Package
  perception_pkg/ # My group's Perception ROS Package
CMakeLists.txt # colcon build instructions
package.xml   # ROS package details
src/          # C++ Code lives here!
my_pytorch_py_lib/ # My custom python module
scripts/     # ROS Python Executables
  camera_node.py # Camera node code
  detection_node.py # Detection node code
```

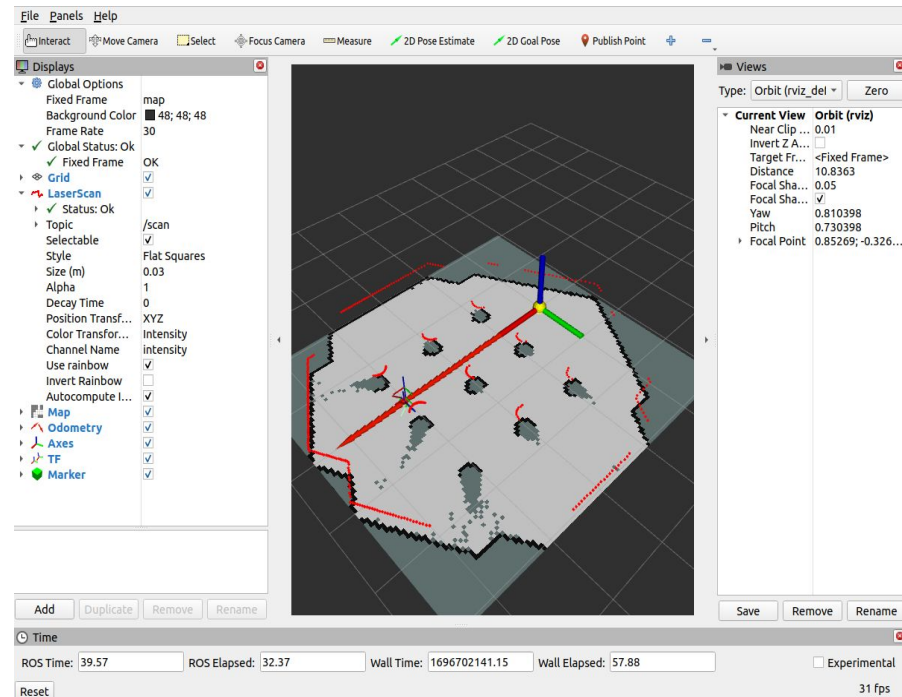
Today

- Become familiar with information visualization in ROS2 with RViz.
- Learn how to write launch files.
- Test out code on the actual robot!



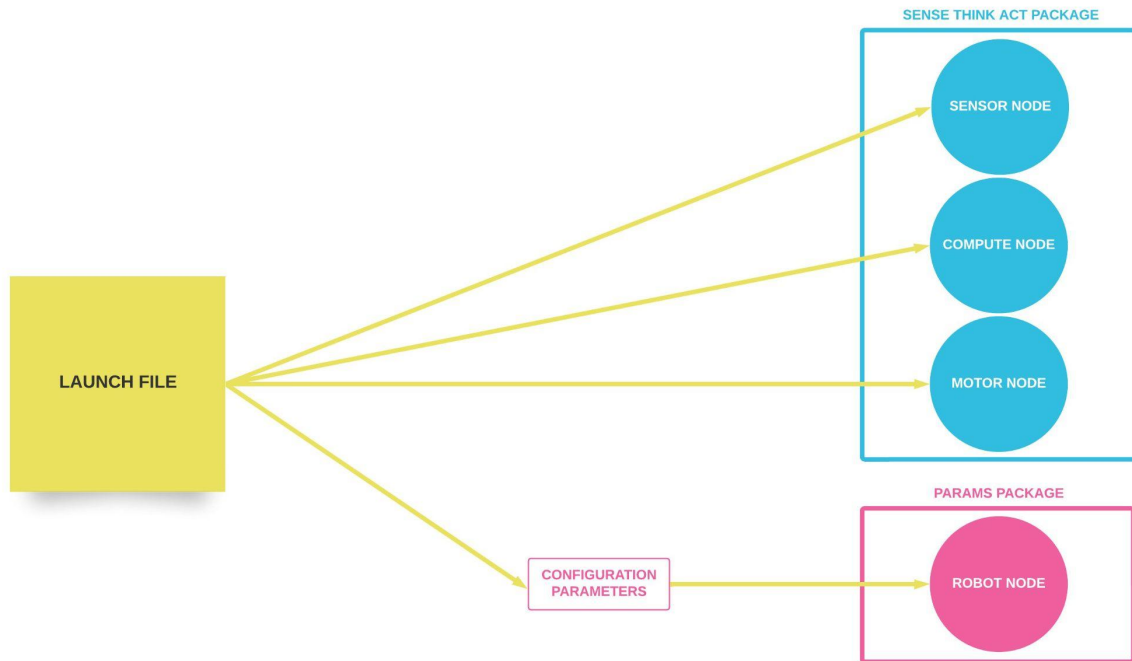
RViz

- ROS 3D visualization tool
- Can think of it as a graphical user interface (GUI) wrapper around `ros2 topic echo`.
- Visualizes information which otherwise wouldn't even be parsable, let alone parsable in context.
- E.g: Laser scans are a complicated mix of floating-point numbers, but RViz nicely plots them as point clouds which respect to the world frame.



Launch files

- Launch files simplify running complex systems with many nodes and specific configuration details.
- You can create launch files using Python, XML, or YAML, and run them using the `ros2 launch` command.
- We can also have launch files inside another launch file!



Live ROS Demo.

RViz Markers

- Say you have some intermediate goals or other world points that you use in your autonomy stack.
- Markers allow you to visualize these points aside from just printing them in the terminal.

