

**EECS/BIOE/ME
106A/206A**

LABS 5 & 6



ROADMAP (MODULE B)

This Week (10/2-10/6)
Start Labs 5 and 6

1

Next Week (10/9-10/13)
Continue Labs 5 and 6

2

Two Weeks 10/16-10/20)
Buffer week

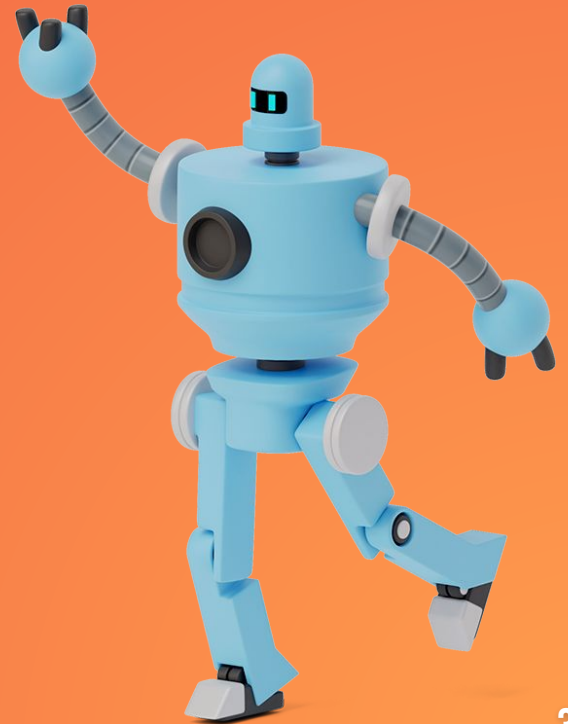
3

Three Weeks (10/23-10/27)
Labs 5 and 6 Due
Start Labs 7 and 8

4

REMINDERS

- Only attend your assigned lab section
 - If you aren't feeling well, don't come to lab
- Keep your stations clean and wipe before use
- Don't work in the lab alone
 - Should be working in groups of 2 anyways
- **HAVE A HAND ON THE E-STOP**
- **USE ZERO-G MODE**
 - you should not need to push the arm to move it
- Use `Ctrl+C`, `exit`, and `pkill -u $(whoami)`



LAB 5

Inverse Kinematics



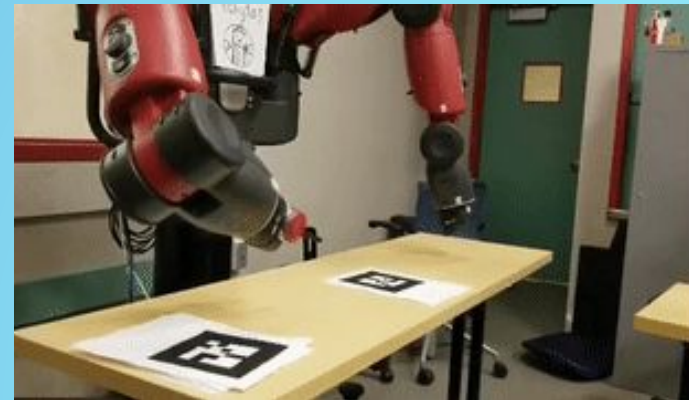
GOALS

Checkpoint 1

- Learn about URDF/xacro
- Apply inverse kinematics for Sawyer
- Confirm that it matches with the forward kinematics output

Checkpoint 2

- Apply inverse kinematics to a real Sawyer
- Use the gripper!
- (at least attempt to) Perform a pick-and-place task with a Sawyer



GOAL



LAB 6

Occupancy Grids



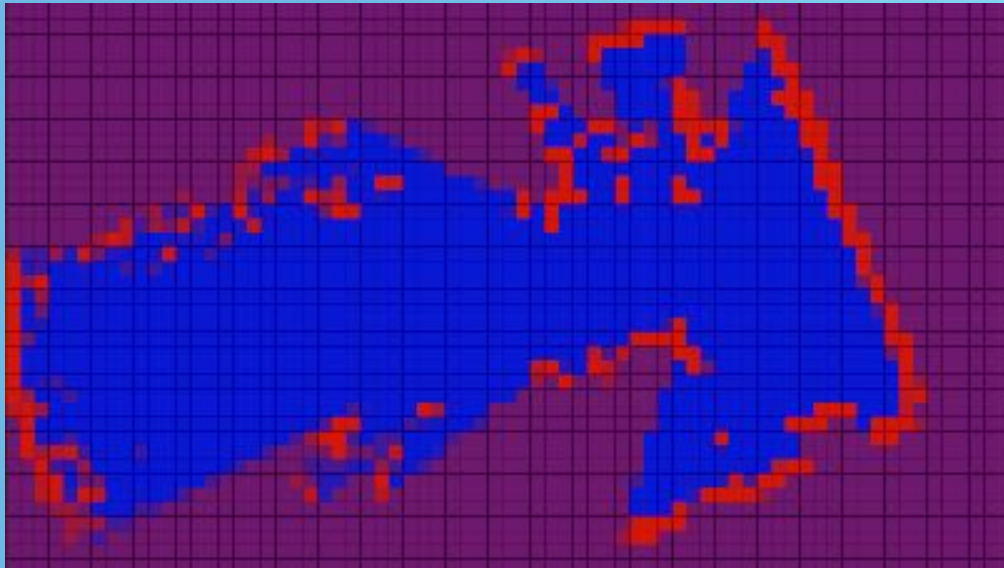
GOALS

Checkpoint 1

- ROS parameter server

Checkpoint 2

- SLAM w/ odometry and laser



PARAMETER SERVER

- A parameter server is a shared, multivariate dictionary that is accessible via network APIs.
- Nodes use this server to store and retrieve parameters at runtime.
- Best used for static, non-binary data such as configuration parameters.
- Globally viewable so that tools can easily inspect the configuration state of the system and modify if necessary.

IMPORTANT INFORMATION

Lab 5:

- Don't hit table with gripper
- No roscore
- Use tf_echo to get good positions
- Plan out each step in the pick-and-place task
- Mark block initial position
- Easier picking from top
- Have a hand on the E-Stop button whenever you are running code

Lab 6:

- Be careful with occupancy map update rules
- Draw out how your occupancy map algorithm assigns probabilities to grid squares
- Refer to Robot Usage Guide or Lab 4 for basics of TurtleBot usage

ANY QUESTIONS?

Help/Checkoff form:

tinyurl.com/fa23-106alab2

