ANNOUNCEMENTS + REMINDERS

- If you aren’t feeling well, don’t come to lab
- Be respectful to everyone
- No food/drink in the lab
- Keep your stations clean
- Don’t work in the lab alone

- **Ctrl + C** out of all terminals before leaving
- **Use `pkill -u [username]` to log out**
You must get checked off for Lab 2 before working on Labs 3 or 4!

You must have completed the Robot Usage Quiz before starting!
GENERAL ROBOT RESPONSIBILITY

DO:

▪ DO be aware of your surroundings
▪ DO test code in simulation before running it! (if applicable)
▪ DO ask a staff member if you’re ever unsure of how to do something!

DON’T:

▪ DON’T make hardware modifications!
▪ DON’T close a terminal without pressing Ctrl+C!
▪ DON’T use robots without a partner!
SAWYER RESPONSIBILITY

**DO:**
- **DO** be ready to press the E-Stop at a moment’s notice so the robot doesn’t crash into anything
- **DO** hold the robot arm by the cuff when moving it manually (zero-g) mode
- **DO** be especially careful when handling these robots

**DON’T:**
- **DON’T** manually move the robot except when holding the cuffs
- **DON’T** get too close to the Sawyer robots!
TURTLEBOT RESPONSIBILITY

**DO:**

- **DO** make sure you’re using the correct TurtleBot for your workstation
- **DO** be careful with TurtleBots on the floor!
- **DO** plug in and turn off the TurtleBots when charging

**DON’T:**

- **DON’T** leave the TurtleBots on the floor after you have finished
- **DON’T** leave the TurtleBots uncharged
LAB 3
Forward Kinematics/Coordinate Transformations
Goals

▪ Practice computing forward kinematics maps
▪ Show that your FK implementation matches ROS
▪ Leverage the powerful functionality of tf2
▪ Control Sawyer to joint-position goals
LAB 4

Introduction to TurtleBot
GOALS

▪ Bring up and control a TurtleBot from keyboard
▪ Perform SLAM and navigate in the map
▪ Track the TurtleBot’s ARTag with a camera
▪ Make a TurtleBot track a second ARTag
IMPORTANT INFORMATION

Lab 3:
- Must do pre-lab from HW!
  - Otherwise, this lab will be very painful!
- The `/intera.sh` scripts produce a lot of output - safe to ignore
- Print out your initial joint angles before moving the arm to a different position
- Press the E-Stop immediately if anything looks like it’s about to go wrong

Lab 4:
- Only have one TurtleBot controller (keyboard OR custom) running at a time
  - Otherwise, the two controllers will send conflicting commands!
- Positive X on ARTag is NOT positive X (forwards) on the TurtleBot
  - The lab doc accounts for this already :)
- Pay attention to which commands should be run via SSH vs on workstation
- Turn the TurtleBot off and on again if it’s not connecting
LAB USAGE GUIDE IS RELEASED!

https://ucb-ee106.github.io/lab-guide/

Very helpful if you have specific questions about lab concepts – goes a lot more in depth than the lab doc!
ANY QUESTIONS?

Help/Checkoff form:
tinyurl.com/fa23-106alab