

Live demo due: **Friday 4/27 - 8:00 PM**

Report due: **Wednesday 5/2 - 11:59 AM**

## Demo

You will be required to demonstrate the functionalities of your SIXT33N robot, either in person during your lab time or by taking a video of it working properly.

You have 2 options to fulfill this requirement:

1. Live Demo:  
For the live demo, you will show your lab GSI your completed SIXT33N robot. Both partners should be present at the final demonstration.
2. Video Demo: Instead of showing your GSI your project in person, you can upload a video of your SIXT33N robot to YouTube. Your video must:
  - (a) Start by introducing you and your partner. Each partner's face must be seen in the video.
  - (b) Explain what commands (words or genres) will be used and the desired behavior corresponding to each command.
  - (c) Explain what commands (words or genres) will be used and the desired behavior corresponding to each command.
  - (d) Explain what the word you are about to say is supposed to do as it's hard for us to memorize all 4 of your commands up front.
  - (e) ***The video cannot be edited or sliced - it must be one continuous video.***
  - (f) The video must be linked in a checkoff request *before* **Friday 4/27 - 8:00 PM**.

Specific requirements for the demo are listed below:

1. Indicate your chosen command words and the expected action.
2. Set SIXT33N on the ground and say each command, one per step (a cycle of listening, identifying, and moving).
3. SIXT33N should respond with the correct movement.
4. Each command must be said at least twice, in any order.

NOTE: you can re-position SIXT33N in between commands to avoid hitting walls.

# Report

In addition to your demo, you will submit a 2-page written report for the project to Gradescope. The report must be uploaded before **Wednesday 5/2 - 11:59 AM**.

The following topics should be included:

1. Front end circuit: Give the final schematic. Explain each stage of the circuit and why it is needed. Give expressions for the gain and frequency response of each stage.
2. PCA Classification: Discuss which commands (words or genres) worked well and which did not. Explain any processing you implemented to make the PCA or classification more robust.
3. Controls: Give both the open loop and closed loop model. Explain why the closed loop is necessary. Discuss how you selected your  $k$  values to make SIXT33N drive straight, and how this was modified to create turns.
4. General: Explain what you have learned from the project, and any interesting experiences. Explain why (if needed) your SIXT33N did not function as expected. Optional: Feedback on the project.
5. If you did a video demo, include a link to your video.

Your report should include the following figures/diagrams:

1. Final schematic of your front end circuit with stages labeled.
2. Block diagram of closed-loop control scheme.

A report template and the grading rubric are available on the course website.