EECS 388 - Final Project

This document contains important information about the final project and is considered mandatory reading for the final lab project.

Team formation:

Each team will consist of 4 members, *all from the same lab session.* Cross lab teams are not permitted. If there are no more students left, a team can have 3 members.

Deadlines:

The final project has three milestones. They will have the following deadlines:

Final Project Milestone	Release Date	Deadline
Milestone 1	April 3rd	Two weeks from lab
Milestone 2	April 17th	Two weeks from lab
Milestone 3	April 17th	Two weeks from lab

The deadline will last until the end of the lab class for each lab session on the day of the deadline. This means the demos can be completed during the lab class.

Demo and project submission:

The completion of the project will consist of two parts:

1. Submission of the code – 50% of total points
2. Oral examination for each milestone – 50% of total points

The oral examination must be completed with each team's own GTA. Students can go to other GTAs for help with the project, but demos need to be completed with the team's GTA.

The same 10% per day late submission penalty will apply as before. No submissions will be accepted on or after the stop day.

Oral Examination

Oral examination will consist of questions covering the various aspects of the project that the students have completed and the code they have written. For each milestone, there will be an interview session where teams will be asked questions regarding their contributions in the project, including but not limited to:

1. The code they have written, including
   a) any functions they used and their parameters*
   b) the purpose of specific lines of code they have written

2. The objectives of the milestone
3. Challenges they have faced during the project and their attempts to overcome them

* *Note, for library functions, implementation details will not be asked, only what the function does on a high level*

The oral examination can be taken whenever the team feels they are ready, within the deadline. For each question asked during the interview, any team member can answer, and any member can help when someone else is answering. Since this is more akin to an exam and not a demo, multiple attempts at the oral examination will not be permitted.

Extra Credit Milestone:

Time and circumstances permitting, an "extra credit" milestone may be provided towards the end of the final project for additional points. This will be purely optional, will be designed to give additional insight into some aspects of embedded systems and will serve as an opportunity for students to score extra points.

Equipment Maintenance

For the final project, you will be using a RC car that has been retrofitted to work with the HiFives. How this works is described in the Milestone 1 lab sheet. Because the setup has a lot of moving parts and a lot of wiring between the devices (the HiFive, the Pi and the car), it is essential that you handle them with caution. You will also be using the setup for the rest of the final project, therefore it is essential that you take good care of it so that it does not break before the end of the labs.

Outlined below are some of the measures you should follow for taking care of the setup:

1. Always prop up the car on a raised platform (we generally put them up on rolls of tape)
2. If possible, do not remove or change any of the wiring
3. Make sure there's no tension in the USB cable going from the HiFive on the car to the desktop
4. Always turn of the cars motor before leaving
5. Always charge the batteries in the car before leaving

A checklist for making sure the car always calibrates correctly every time has been given at the very end.

Car Calibration Steps:

Follow this checklist to ensure your car will get calibrated properly and your code will run properly.

1. Turn the car's motor OFF (your GTA will show you how to do that)
2. Build and upload your code to the HiFive
3. Once the upload is complete, unplug the HiFive
4. Turn the car's motor ON
5. Plug your HiFive back in. You *don't* need to reupload your code, it should automatically start running on its own.
6. Once your code starts running, you should hear a beep indicating the calibration was done successfully (assuming you implemented the calibration step)

Debug checklist

Car not working? Try these steps:

1. Make sure you have followed the checklist
2. Make sure your functions have the right parameters
3. Make sure your code was actually uploaded. Sometimes PlatformIO will say script completed, but actually fail to upload the code. The terminal will have some error that says J-Link connection failed
4. Make sure the battery is not dead. Try the battery unlock (GTA will show you how)
5. If the wheels are too fast, check your PWM values.