Spring 2020 EECS192 Mechatronics Design Laboratory Oral Presentations v. 1.0

During Dead Week- time TBA, Tues/Wed May 5,6

The purpose of the oral presentation is to provide you with an opportunity to inform your peers about what made your car successful. The style should be of a professional technical presentation. Due to the size of the class, each group's presentation will need to be no more than 10 minutes with two minutes left for answering questions. Be sure to practice and time your presentation. Assume that your audience is very familiar with the project. Hence, you do not need to explain how the line camera sensors work or how the program is compiled.

Typically, going through ten slides in ten minutes is about right.

Submit a pdf version of your slides by 5 pm Tues May 5 on BCourses.

If you would like feedback, you may optionally submit a draft version by 5 pm Friday May 1.

The following items should be addressed during your presentation:

1. Vehicle Hardware (15 %)

Show a basic block diagram with major hardware subsystems. What is different about your hardware (basic electronics/wiring)? What are the advantages and disadvantages your methods? Some items that you might want to consider are cost, complexity, reliability, and accuracy. Including photos to illustrate features is helpful.

2. Software (20%)

Provide an overview block diagram of your software. What is unique about your software? For example, do you use auto calibration of sensors, course memorization, automatic determination of gain constants for the controls, etc.? Note update rates for various processes. How did you make your line sensing robust?

3. Controls (20%)

What kind of stability problems did you have and how did you overcome them? State how you implemented the controller and how you chose the gain constants. What gains were used (radians per meter, radians/(m/sec))?

Complete the following table, comparing real car and simulation:

Real				Sim			
k_p	k_d	max step err	vel	k_p	k_d	max step err	vel

4. How well did it work? (20%)

Record the lateral error during a run at speed between START and END on the track as shown below. Plot lateral error versus time (and velocity versus time, if available). Be sure to note your velocity (m/s). Explain from the plots where the control system would allow the car to go faster, or where the car is at some stability limit.

5. Lessons learned (20%)

What were your most memorable glitches, failures or debugging issues?

What didn't you know that you needed to know?

Advice for students in next year's class?

6. Roles and Contributions (5%)

Briefly describe the role of each team member.