

Spring 2016 EECS192 Mechatronics Design Laboratory Oral Presentations

Thu. Apr. 28, 9-1130 am / and 4/28 or 4/29 room, time, tba.

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 9 minutes with two minutes left for answering questions and changeover. 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 0900 Thu. April 28 on BCourses.

The following items should be addressed during your presentation:

1. Vehicle Electronic and Mechanical Hardware (15 %)

Show a basic block diagram with major hardware subsystems. What is different about your hardware (basic electronics/wiring)? Briefly note mechanical issues such as mounting boards, camera, vibration, suspension issues, etc. Include photos to illustrate features. What are the advantages and disadvantages your methods? Some items that you might want to consider are cost, complexity, reliability, and accuracy.

2. Software (20%)

Provide an overview block diagram of your software. Describe organization (with a picture) of threads, tasks, timing etc. Note update rates for various processes. 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.? How did you make your line sensing robust?

3. Controls (15%)

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))? Did simulation provide any help?

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

Record the lateral error, including waterfall plots, during a segment of a run at speed including only the last turn and the steps on the courtyard track. 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 (25%)

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

What tools did you use- e.g. telemetry, autotuning, custom tools, simulation? What didn't you know that you needed to know?

Advice for next year's class?

6. Roles and Contributions (5%)

Briefly describe the role of each team member.