Professor Fearing EECS192 Progress Report v 1.01 Spring 2021

**Due: Fri. April 9, 2021 8 pm on Bcourses.**

The purpose of the progress report is to give you a chance to provide final documentation for project hardware, evaluate your interim progress in software, and to set final goals for the project. (In addition, professional technical communication is an important skill to master.) The progress report is a non-trivial amount of work; we would like to see 6 hours of effort per team member. Here is an outline for you to follow (yes, we want you to address all of these points).

**1. Current State of Project (1 page) (20%)**

What is your current hardware configuration? What types of sensors have you used? How far has your software been developed? Which software modules are currently working? Which still need further debugging? Provide overall block diagrams for the electronic hardware systems (ppt is fine for simple block diagrams).

**2. Hardware Documentation (n pages as needed) (20%)**

Provide complete connection/wiring diagram to the Huzzah32 IO and power connections, using
`https://inst.eecs.berkeley.edu/~ee192/sp21/files/huzzah32_pins.png`
for the following hardware modules:

1. speed sensor connnections (5 pts)
2. line camera connections (5 pts)
3. power supplies (how are things actually connected with batteries, etc) (5 pts)
4. Include photo(s) showing how the Sparkfun speed sensor is mounted on your car. (5 pts)

**3. Documentation for Software (2 pages including figures) (45%)**

a) What software have you implemented for Checkpoint 7? Please describe your implemented software system, including:
i) software block diagrams in data flow style.(10 pts)
ii) Make a timing diagram, e.g. as shown in Lee and Seshia Fig. 12.10 (p. 341) for task execution. (10 pts)
`https://ptolemy.berkeley.edu/books/leeseshia/releases/LeeSeshia_DigitalV2_2.pdf`

b) Describe in detail your line finding and control algorithms:
i) line detection strategy, findmax, etc. Quantify performance, e.g. resolution in cm (10 pts)
ii) steering controller, e.g. PID with gains in physical units. (5 pts)
iii) Using data from C7 on your car run, show step response and track position estimation. (5 pts)
iv) What problems in behavior did you see in C7 (this can be qualitative)? (5 pts)

**4. Advanced Control (1 page) (15%)**

Describe improvements in detail you plan to use for the simulated car control in V-rep to get higher performance, say 4 m/s? (These can be sensing improvements or control/learning approach).