EECS192 Lecture 13
Virtual Race1
April 20, 2021

Topics
- Oral Report: Tues May 4/Wed May 5
  - submit pdf of ppt slides to BCourses by 5pm Tues May 4.
- 4/27: Quiz 5: bicycle model
- Round 2 (live/hardware) in class 4/27
- Round 1 (simulation) in class 4/20
  - Submit Python 3.7 code, we run.

Oral Report

https://inst.eecs.berkeley.edu/~ee192/sp21/docs/oral-present.pdf

- Slides due on bcourses 5 pm Tues May 4.
- The style should be of a professional technical presentation. (No hand drawn diagrams)
- Each group's presentation will need to be no more than 10 minutes with one minute 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.

Oral Report, cont.

1. Vehicle Hardware and Embedded Peripherals (20%)
c) Describe how you used any of the embedded peripherals for generating signals, counting pulses, measuring intervals, generating interrupts, etc.
For example PCNT and MCPWM might be used for velocity sensor and line camera respectively.

2. Line Sensor Algorithm (20%)

3. Software (20%)

4. Controls (25%)

5. Lessons learned (10%)

6. Roles and Contributions (5%)
Briefly describe the role of each team member.

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Round 2 Tues 4/27 5 pm

1) Video of best run(s) + telemetry plots
   - Will be shown in class and discussed
   - Can do live on personal track
   - Be prepared to explain plots if not clear
   - Use timer/distance to show speed

2) Can do Courtyard or personal track
   - score = max{Courtyard, personal track}

Round 2 Cory Track Scoring (+20 pts max) (Draft 4/13)

-0.5 points	Twitchy steering
-0.5 points	Goes wide on curves
-0.5 points	Oscillatory step response
-1 points	Ignores stop marks

-0.5 points	Slower than 2.5 m/s
-1 points	Slower than 1.5 m/s

-1 point	Does not finish track
-2 points	Finish < ½ track
- 3 points	Finish < ¼ track

Round 2 Personal Track Scoring (+20 pts max) (Draft 4/13)

Step Response

-1 points	Oscillatory step response
-1 points	Slower than 2.5 m/sec
-2 points	Slower than 1.5 m/sec

S Curve or Fig 8

-0.5 points	Twitchy steering
-0.5 points	Goes wide on curves
-0.5 points	Ave speed Slower than 2.5 m/s
-1 points	Ave speed Slower than 1.5 m/s

Straight line- drag race

-0.5 points	Twitchy steering
-2 points	Misses stop line
-0.5 points	Peak speed Slower than 2.5 m/s
-1 points	peak speed Slower than 1.5 m/s

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Virtual Race Tues 4/20 in Class
Goal: every team ``competes'' with control alg. on same track.

- Round 1 Race Track released for testing Saturday 4/17 5 pm (72 hours)
- Pre-submit your code on bCourses. Only submit your updated controller.py (we will let you know if it works if submitted by Sunday 4/18 6 pm)
- Your code must work on Python 3.x.
- You must be using the provided carInterface.py.
- You must not modify the call signature to SimulationAssignment.__init__, setup_car, and control_loop. We will be using a different __main__ block to run your code.
- You have 3 minutes of simulation time, with requests for re-runs handled in round robin order.
- Your code must run as a self-contained unit:
- Your code may not do disk operations (outside the csvfile.writerow) or network operations.
- If using memorization, your code must automatically (and without being restarted, or with command-line arguments, or any manual intervention in general) detect the end of a run and continue the next lap with whatever memorization-based algorithms you're using.
- As per NATCAR rules, you may not pre-program in data about the track.

Round 1 Deductions (+10 pts max)

-0.3 points	Twitchy steering
-0.3 points	Goes wide on curves
-0.3 points	Oscillatory step response
-0.5 points	Hits cone(s)
-0.5 points	Ignores stop marks

-0.3 points	Slower than 2.5 m/s
-0.5 points	Slower than 1.5 m/s

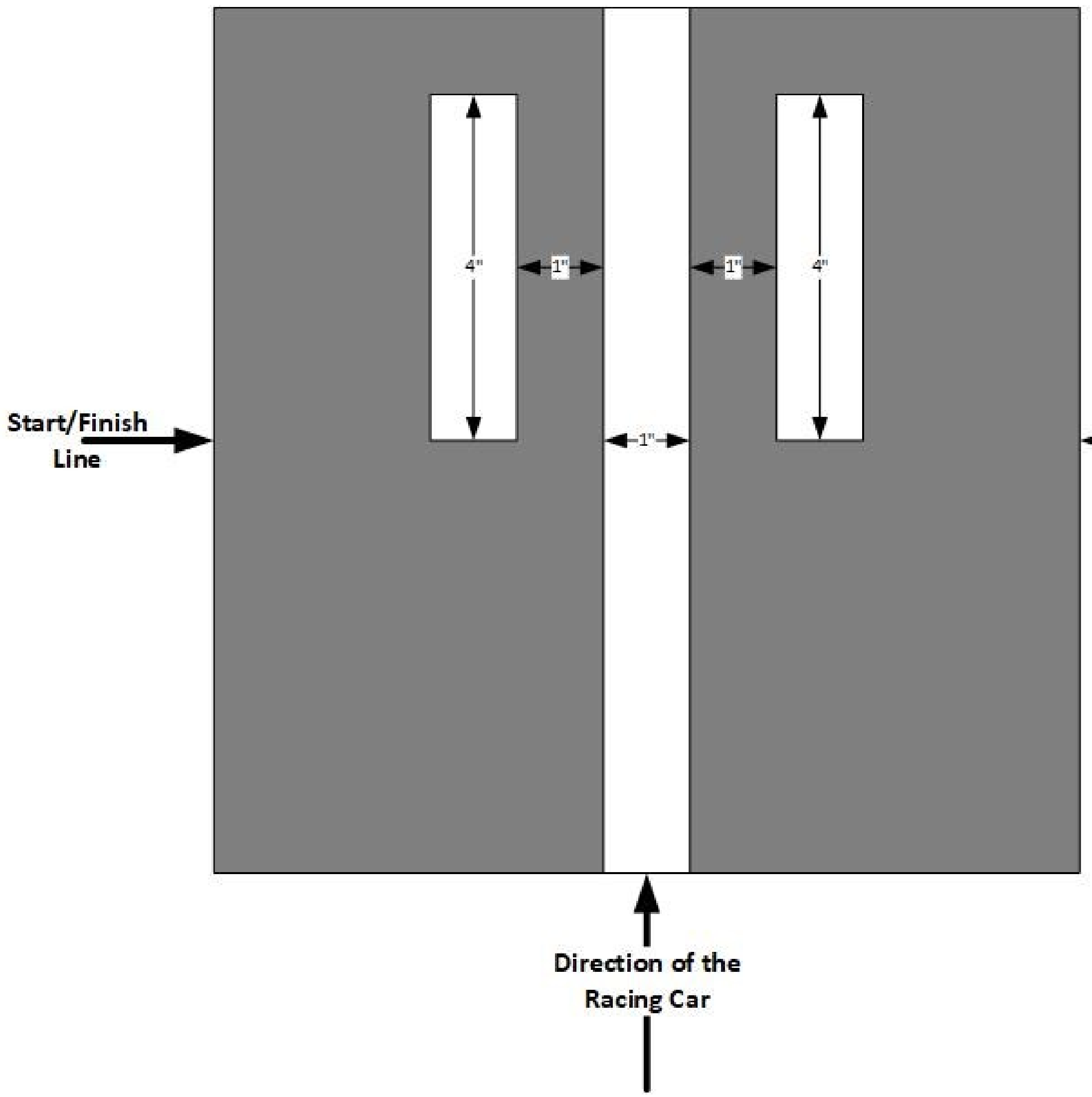
-1 point	Does not finish track
-2 points	Finish < ½ track
- 3 points	Finish < ¼ track

Round 1 Notes

Cones +2 second
Finish line:The start/finish line will be marked with two 4-inch-long segments of 1-inch-wide white tape that are parallel to the track with 1-inch spacing, as shown in the figure below.

The car must automatically stop within 6 feet of the finish line after finishing the race.

A penalty of 4 seconds will be added to the lap time for any car that does not automatically stop within the required region.



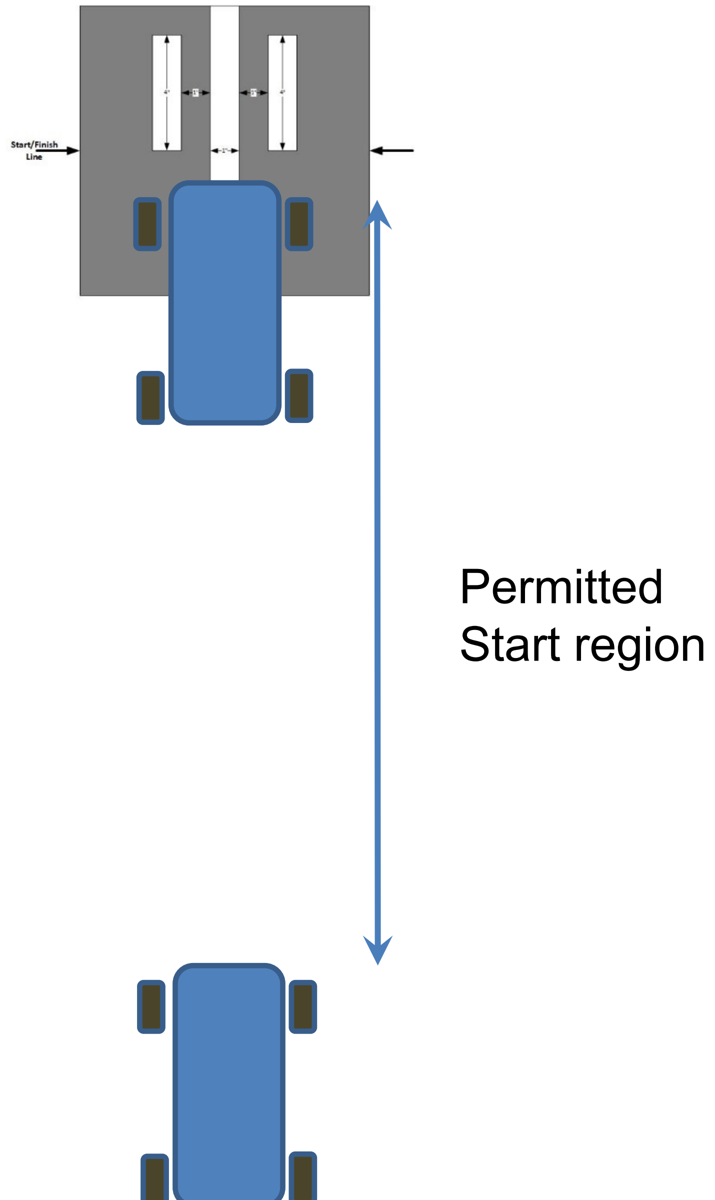
Round 1 Notes

1. Car can start in region shown (running start or avoid seeing stop line…) up to ``several feet” behind start/stop line

2. A running car can continue running for consecutive laps. If car is doing multiple laps without stopping, 4 second penalty is applied to intermediate laps.

The car must automatically stop within 6 feet of the finish line after finishing the race.

A penalty of 4 seconds will be added to the lap time for any car that does not automatically stop within the required region.


Start/Finish Line
Permitted Start region