

Multivehicle collision avoidance project

Summer 2011

Path layout

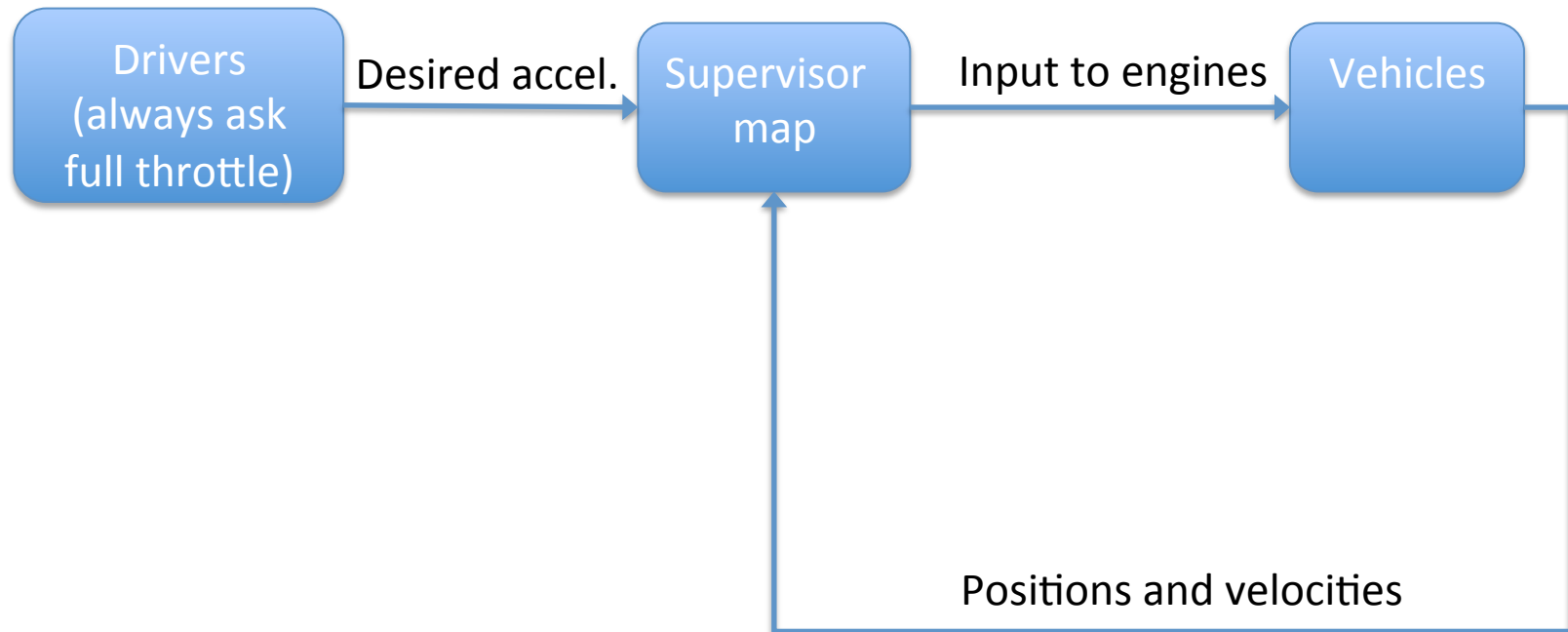
2 figure-of-eight, 3 cars each



Problem overview

- 6 vehicles drive autonomously along the two paths
- All vehicles know position and velocity of the other vehicles
- The same safety algorithm runs on all vehicles
- Vehicles follow a prespecified simple rule (e.g. go at max speed) unless forbidden by safety algorithm

Control scheme



Tasks

- [T1] Design path following pseudocode
- [T2] Design pseudocode for the rear-and collision avoidance (supervisor state O1)
- [T3] Design pseudocode for the supervisor automaton
- [T4] Implement code T1-T2
- [T5] Implement code T3
- [T6] Design pseudocode for side-impact avoidance at intersections (supervisor state O2).
- [T7] Acquire vehicles' parameters
- [T8] Implement code T6 and test on pc
- [T9] Test full algorithm on vehicles

Keep the code modular, clean, and well documented.

Your code will be used by others!

Timeline

- By June 20th design and implement automaton (T3+T5)
- By July 4th design and implement path following and rear end collision code (T1,T2,T4)
- By July 11th code tested onboard and debugged
- By July 18th acquire vehicle's parameters (T7)
- By August 1st design, implement and debug side impact code on pc (T6,T8)
- By August 8th test code onboard and debug (T9)
- By August 15th working demo

Meetings

- Mondays 5:30pm-6:30pm
- Meeting format: each student gives a ppt presentation showing:
 - work done during the past week
 - difficulties/problems that were solved and how
 - problems left to solve
 - how they will be solved in the coming week
- Presentations should contain as much detail as possible including figures, data, code, plots, etc.
- Presentation should be uploaded on the wiki page under the section “multivehicle collision avoidance project”:
<https://wikis.mit.edu/confluence/display/DeIVecchioLab/Multi-vehicle+Lab>
- Note: the link to the project will appear only after you log in as it is a protected page