Intersection Conceptual Ideas

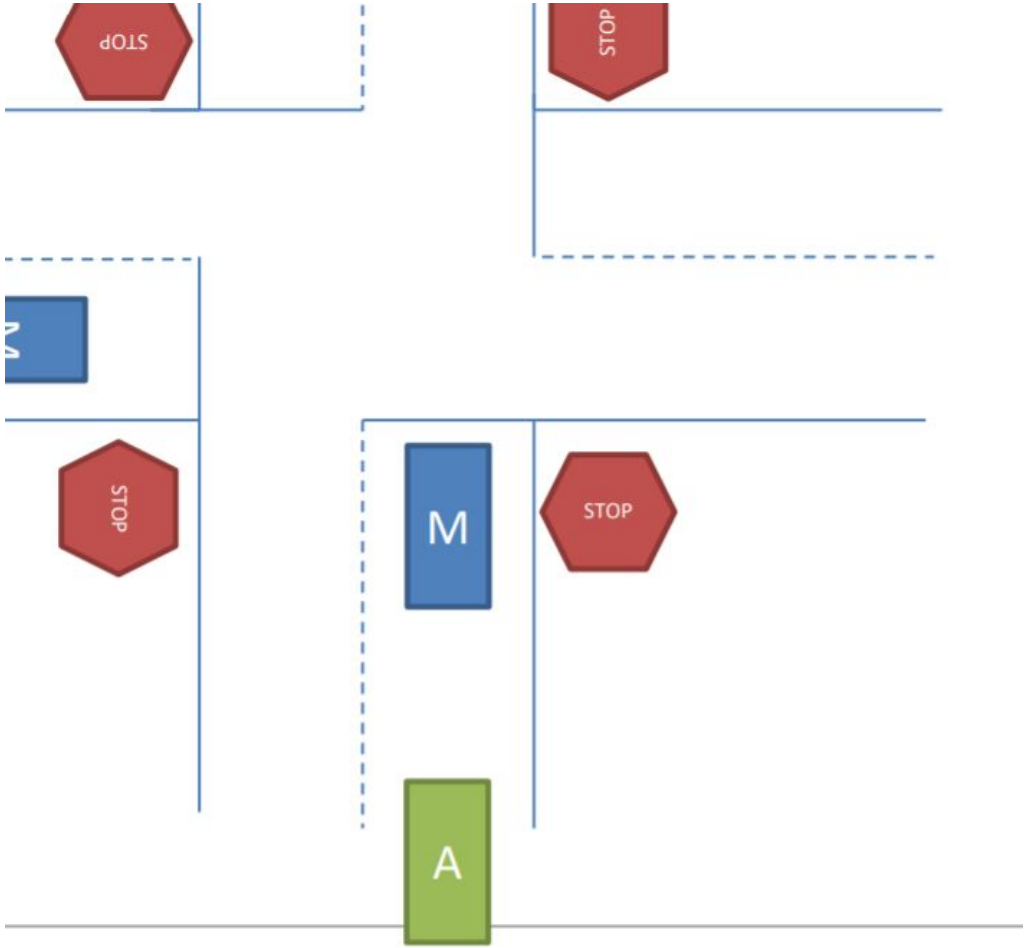
Group 5, Self-named Cybercar G5

Team Members:

Nuria Cara Navas
Elsada Lagumdzic
Chi Hong Chao

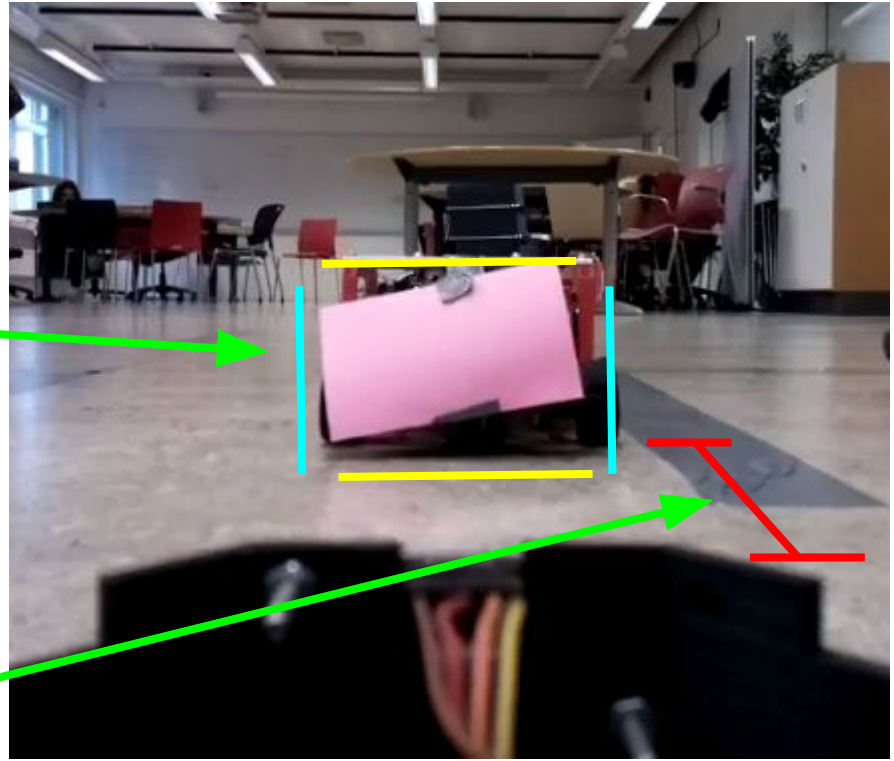
Adaptive Cruise Control

“ Just follow the box “



ACC (continued)

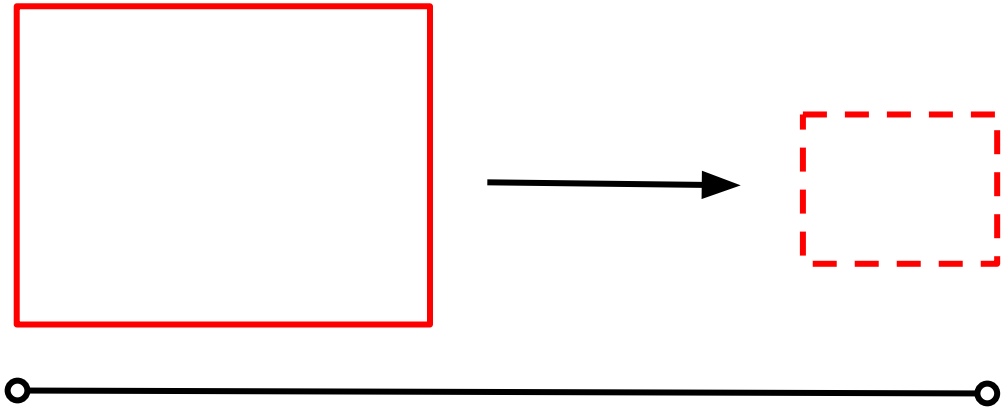
- Adaptive cruise control
  - Start with only length and width
  - Would have to implement logic on adjusting direction of car to follow box
  - Measures will have to be taken to prevent overreacting as mentioned in lecture
- Most ideal to use both sensors and camera to implement ACC
  - Sensors can be used as collision detection, for example.



ACC (continued)

Additional Ideas

- The speed/rate of the box getting smaller or bigger can be an indicator of how fast our car is approaching the one in front, providing additional information to maintain a safe distance.

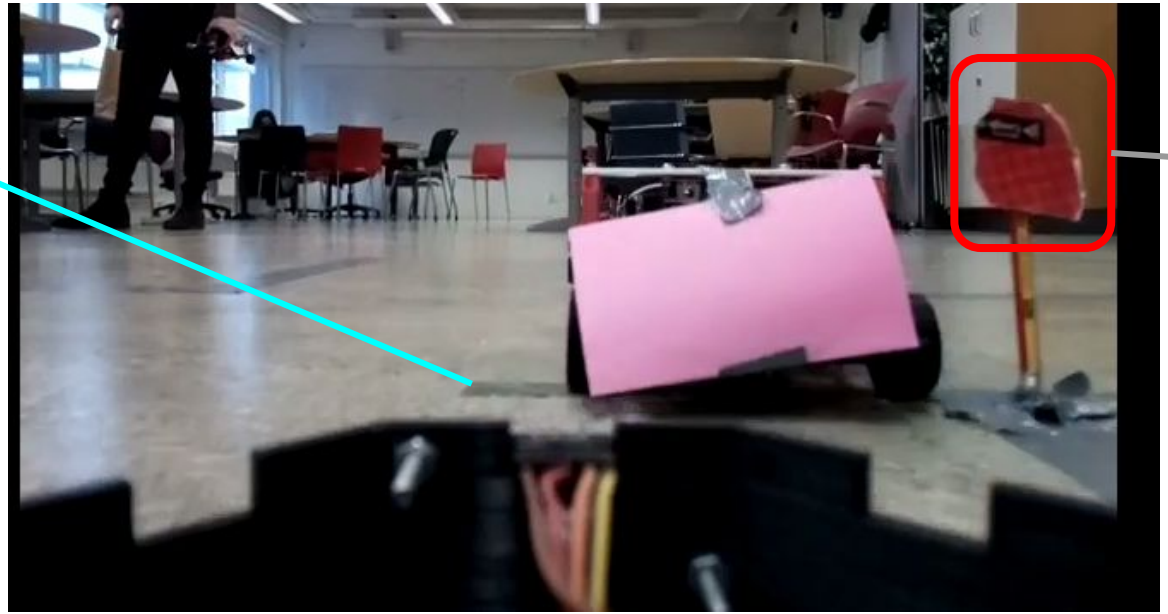


0.5 seconds

= our car in front is accelerating quickly

Determining when to Stop

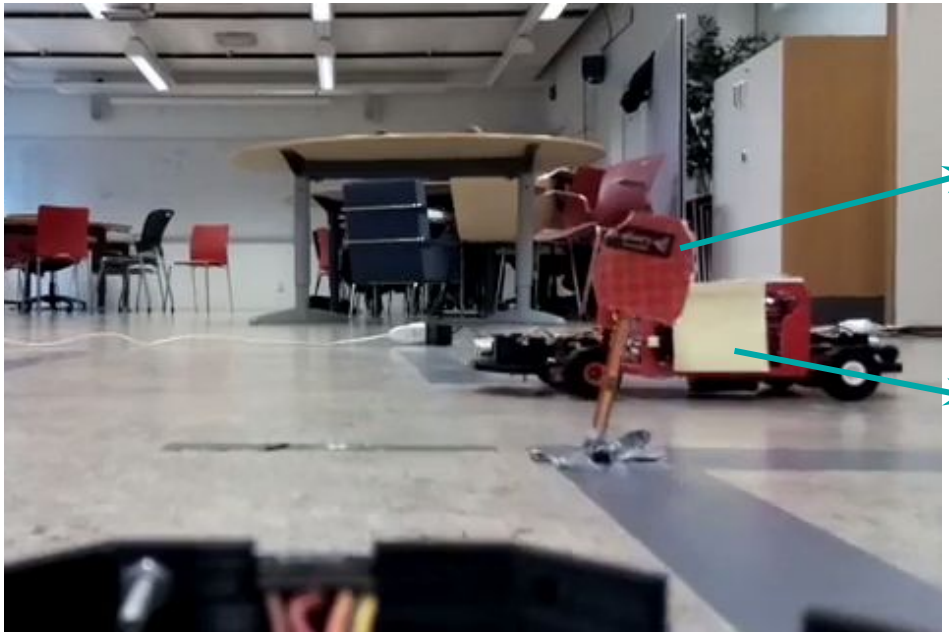
If line is visible, can be used to determine where to stop as additional info.



Stop sign takes Priority over ACC when detected - stops ACC

Start simple - when sign is detected, stop car after 1 second.

Determining Order to Leave Intersection



Stop sign takes priority

- Can track how far away stop sign is to determine how far away we are from line
- Can also check if there is any car in front of us
- If line visible, can additionally be used to see if we are behind it.

Car not in motion assumed to be in front of line - they will go before us.
If they move again, they will be considered to be after us again.

Corner Cases – Out of sight cars

Car will be out of sight if we go first - will be seen here still, though. Remember car exists.

Use messages.odvd or something to ask other car(s) what their position is in queue - “ Do I go First?”

YES / NO

If other car says “yes”, we go first. If “no”, we wait until car passes

- Another method is to directly broadcast position in queue via messages. Issues: “Trust-based Communication”
- No need for conflict resolution - place full trust in others. If we crash, we can blame other car.
- Easily hackable - can force others to crash into other cars
- For this to work, we need to create own language understandable by other cars.

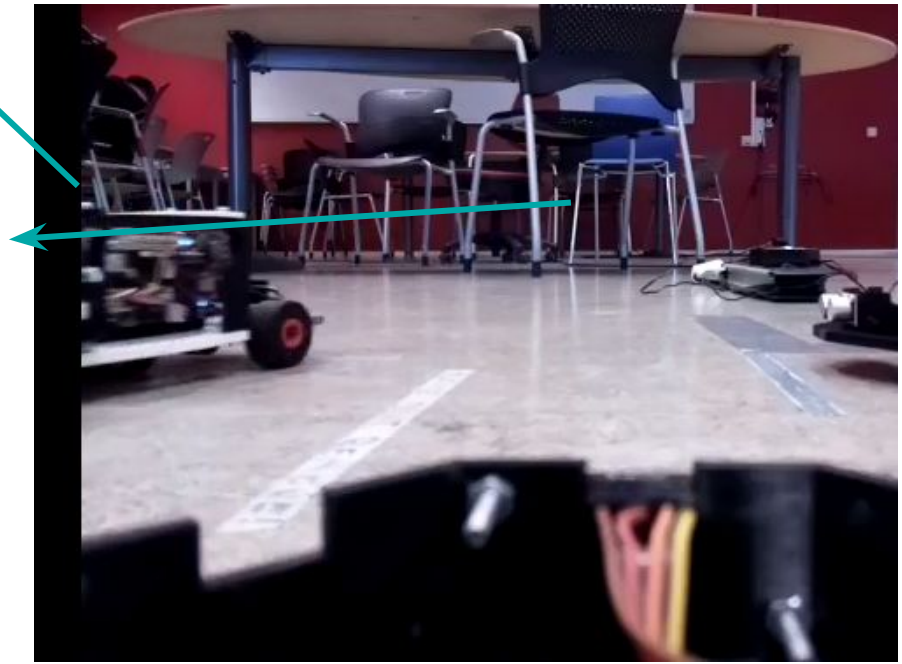
Things not Considered That we Should Have

To be considered:

Background noise/colors may need to be properly defined due to unforeseen reasons.
Perhaps can directly crop background out if not needed.

Ground lines may be useful to have a specific color to be more easily recognizable.

More specific intersection design - in order to accurately replicate things in the final presentation, we need specific definitions of the scenarios or constraints. For example, our car needs to be around 40 cm away from the line for us to see the car at 9 o clock.



Thank you!