

Agenda EMC Meeting #2

Date:	06-05-2020
Time:	11:30 – 12:30
Location:	Online (Microsoft Teams)
Tutor:	Wouter Kuijpers
Chairman:	Emre Deniz
Secretary:	Stan Boheemen

1. Opening meeting

- a. Everyone present?
- b. Tutor announcements
- c. Group members announcements?

2. Design document feedback and discussion

- a. Make more clear what the levels of requirements are in the introduction.
- b. Specify with respect to what the position and heading must be known.
- c. How must the progress to target be quantified.
- d. The perpendicularity is still largely known.
- e. There will be holes in the walls, might be approx. 100mm.
- f. Laying no assumptions at all on straightness of walls is very tough constraint. Walls can still be assumed straight.
- g. LRF must be safety layer, always having priority over the position measurement collision avoidance.
- h. Maximum velocity must be 0.5m/s according to the customer.
- i. In an emergency situation, collision avoidance might be priority over driving forwards.
- j. Arrows between world model and strategy and world model and control should not both be there. Make strategy only about discrete events.
- k. **Specifications, components, functions and interfaces chapters are really good. Requirement should still be a bit more specific.**

3. Software exploration

- a. PDF cheat sheet (instead of C-file)
 - i. Doesn't really matter how you phrase it, it would be good to have some document with overview and specifications.
- b. Simulation & visualization
 - i. Currently, there's no way to automatically reset and restart the simulation. We could try it ourselves.
- c. Joep suggested to start thinking more from strategy towards requirements for the perception, rather than vice version.

4. Escape room competition

- a. Plan of actions (**FSM**)
 - i. Must be a loop back from ExitFound no, which is the case when we think an exit is reached, where it is actually not.
- b. Gap detection **algorithm**

- i. There are different approaches, first one is rotating a circle and seeing whether a suitable gap is found. Second one is following a wall until a suitable exit is found.
 - ii. Wall followers will not have the best time, generally.
- c. Error handling
- d. Being able to drive your own escape room is no guarantee to finish the one during the competition.
- e. Make sure you are robust to no walls in initial view, drift and slip.
- f. SLAM might be a bit overkill for the hospital challenge. A map is already provided, hence the mapping part only considers the few objects. Still, we might copy some of the ideas behind it.
- g. References vs pointers. References have the advantage that nullptrs can't exit. Tutor does not give any indication on what works better.

5. Task definitions

- a. Perception
 - i. Locate adjacent walls, calculate distance to them.
 - ii. Optional: Find walls perpendicular to driving direction.
 - iii. Optional: Find gap in the wall ahead and save its coordinates in the world model.
- b. Strategy and Control
 - i. Ensure that a wall can be followed, also through inwards and outwards corners.
 - ii. Optional: Cut the corner and already start tracking the next wall.
 - iii. Optional: Drive straight towards identified exit.

6. Division of tasks

7. AOB

8. End of meeting

NEXT MEETINGS:

- **8th of May, 12:00**
- **11th of May, 11:00**

DEADLINE: 13th of May, escape room challenge

