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 MEETING: 8th of May, 12:00

DEADLINE: 13th of May, escape room challenge