



Design Studio #4 - Weekly Progress Report #4

DS Instructor: Gülbin DURAL

Partners:

- Fatih ÇALIŞ
- Fatih ÇAM
- Recep GÜNAY
- Huzeyfe HİNTÖĞLU
- Sarah İLYAS

In the previous week:

As stated before, we decided on the hockey game project. Meanwhile, we have done some researches on the robot design, the algorithm which will be implemented on the robot and the play-field etc. Then, we have written the proposal report accordingly. Each group member has written what they are mainly responsible in the project. Proposal report helped us to think and approach the solutions to the problems deeper as doing research and working on report provided us to come up with new ideas and solution methods. Also, the first standard committee meeting, where we specify the standards of the project with the other groups, was held. Before the standard committee meeting, we set a meeting what we should discuss. If we designate the standards suitable for us and convince the other groups with these standards would make our job easier. Therefore, we talked about the robot, play-field, ball etc. In the standard committee, there were 16 groups who have chosen the hockey game project which is significantly large amount of people when compared with the other projects. In the meeting, a director and a reporter were chosen to lead the discussions about the projects. After that, each team representative proposed what shall we discuss for the project. We specified titles to be discussed and subparts of them. For example, we said we are going to talk about the ball. The color, material and the weight of the ball will be discussed in the following weeks. For that reason, every group asked to do some real life researches on balls. For this purpose, as a group, we checked the table tennis ball which seems suitable for the project when considered these specifications. Also, a ball which actually is produced for decoration purposes with less diameter and weight is checked. When compared these two, we understood that real life experience is very crucial for the project and its production. (Huzeyfe)

Mechanical structure of the robot is one of the most crucial factor that affects the almost all the other subsystems. For example, the control algorithm of the robot is heavily dependent on the chassis that we choose. If we choose a 4 wheeled chassis, to obtain a good maneuver capability, we can utilize the differential movement control technique which is basically controlling the motor of the each side separately. This technique can also be used in the case of 2 wheeled robot, however in that case the robot would need a 3rd caster wheel to stand still. Another option for the chassis selection is a 3 wheeled chassis. In this case, omni wheels are used. In terms of the maneuver capability, this option is the best since it allows the robot to move in any direction without rotating to that direction first. However, the control algorithm would be much more complex than the other cases. After determining the chassis in the weekly meeting, we will move on to the main control algorithm of the robot.

Another crucial part of the robot is the “kicking” mechanism. To determine what kind of a mechanism will be used for this operation, we need to take the physical specifications of the chassis into consideration. There are different ways to create this mechanism. One of the ways is to use a relay to create the force. This option requires a high power consumption, therefore this option is not the best solution. Another option is to utilize a spring to store the energy in the form of potential energy, and transform this energy into a kinetical energy while releasing. A motor is used in this option to compress the spring. Although this approach requires more mechanical parts that we are not much familiar, it is the best option to kick the ball at this moment. (Fatih ÇALIŞ)