Darie Picu **s0935756**

SDP individual report 3

I worked mostly in the strategy team implementing methods that would help the robot decide where to go on the pitch so as to be in a good position for getting the ball and shoot. I also worked in construction designing a new kicker to fit around our front spinning wheels and in vision doing solving the mathematics for the parallax effect.

Strategy

Our task in strategy was to provide a plan to Control. A plan is an object which has a set of waypoints through which the robot has to go. Generating the waypoints was done by our A* system, so the main task we had was to find our target point where we wanted the robot to go. We wrote methods that returned whether an open shot or angular shot (bounce ball from wall into goal) was possible from our current position. Similar methods were implemented that computed at which angle the robot needed to get at the ball such that a shot from that point would score a goal. There was however an issue with A*. We could not figure out a feasible way of changing it such that the robot would reach the end of its path at the angle we wanted. The concept of a navigation point was introduced. This is a point situated around the ball such that if you go from it to the ball you would get into an open or angular shot position. Methods of finding this navigation point were implemented. Before the waypoints were sent to Control, some of the waypoints at the end were deleted and the navigation point was introduced into the array. I also finished the ball prediction method that predicts where the ball would be at a given time. This is for the 4th milestone.

I had to use a lot of trigonometry to write the methods. The biggest issue was the angle system. What vision was giving us were angles growing clockwise with the 0 degree angle pointing up. However, the way I always worked in trigonometry is with angles growing counterclockwise with the 0 degree angle pointing to the right. Because of this, a method to convert the angles given by vision was used, and then all the angles we wanted to send out of strategy were converted back. We realized this was a very bad solution and in the end we all agreed on the standard angle system to be used by all parts.

Construction

The spinning wheels at the front of our robot were designed for better control of the ball in dribbling. However, we did not have a kicker working because of them. A new kicker was made to fit around them. We found out that making the kicker as light as possible (while trying to keep it rigid), gave best results in kicking power.

Vision

There were 2 effects that needed to be taken into account in order to improve our vision system: barrel distortion and the parallax effect. Because I did not work in vision, I only wrote the pseudo code for correcting the parallax effect and gave it to Dale to implement it.

Future work

I will continue working in the strategy team trying to improve the ball prediction methods for our 4th milestone. We might redesign the whole robot, because at the moment it is slightly too long and we cannot fit gearing for the main wheels.