System Design Project 2012

Individual report for Milestone 3 – group 8

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1. INTRODUCTION

For Milestone 3, I have worked on the strategy within the AI subgroup, with Michael Johnson, Paul Micolet and Martin Marinov. My contribution consisted in fixing various bugs before the friendly, helping with implementing a part of the strategies and doing JUnit testing for some of the helper functions we were using.

2. CONTRIBUTION

→ Before the first friendly, I have worked with Paul on strategies to navigate behind the ball, when the robot is between the ball and the enemy goal, and on defending penalties.

→ After the whole team decided to refactor the code, I have worked with Paul and Michael on getting the optimal points from which the robot can score a goal.

→ I have fixed the bugs in the helper function we were using and I did some JUnit testing to make sure the maths behind the functions was correct, I have helped a little with the strategy for attack penalties and with various fixes that we needed.

3. AREAS FOR IMPROVEMENT

→ Improving the strategy of getting to the ball when the optimal point is not visible

→ Building a defence strategy for when the other robot has the goal and is trying to shoot

→ Testing with the robot on the main pitch should be a priority, because the behaviour on the pitch is very different from the one in the simulator

4. FROM NEURAL TO CONVENTIONAL AI

At the milestone 2 performance review, I mentioned that I was working on the Neural Networks-based AI. After the milestone, I talked to the rest of the team and we decided that I should help with the conventional one.

5. DETAILS OF THE STRATEGY

Although our strategy worked very well in the simulator, the robot did not behaved as expected at the friendly. This was mainly due to the fact that we did not have enough time to test it with the robot. As mentioned above, we have decided to test every heuristic that we are implementing.

The initial variant of navigating behind the ball made the robot chase an imaginary point at a certain offset behind the ball, so it could align itself to the goal and shoot.

This was strategy was improved for Milestone 3 and instead of the fixed offset, we are calculating an optimal point from which the robot can shoot either directly into the goals, or in the centre of the 'imaginary goals'(*).

6. CONCLUSION

The robot currently avoids an obstacle in 10 out of 10 cases and it scores a goal in 6 out of 10 cases. We plan on improving the last result by the milestone of at least by the next friendly.

In the last 3 weeks the whole AI team has put a substantial amount of work in the strategy. However, the robot did not behave as we expected, thus leading to the failure in the first friendly. Judging by how the robot performs, I think I made a good contribution for this milestone and I should get 6.

However, considering how much work we did for this milestone, the whole AI subgroup should get 9.

* - the imaginary goals are reflections of the the enemy goal on the top and the bottom of the pitch and they are used when shooting the ball from the walls.