**System Design Project – Individual Report 2**

Group 12 – ‘Robot Unicorn Defenders’ - Robot Construction

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**Introduction**

This is the second report on my contribution to our group’s progress of preparing for the second milestone. Our main goal for this milestone was to complete the integration between the vision and movement planning teams as well as to hopefully decide on final construction design of our robot.

**Robot Construction**

Same day after the first milestone robot was taken apart and I spent some time building a new robot with shorter base and better weight balance, since the one we made for milestone 1 had a number of issues. It was struggling to go in a straight line because of the two caster wheels at the back, had a bad front/end weight balance also the construction was not strong enough.

It was decided that we need to put more load onto front wheels to increase friction and also reduce influence of the caster wheel to the direction. Having this in mind, myself and Aleksandar built the robot with motors standing straight up and gears implemented with ratio 3:10. Kicker motor was mounted on top of the robot thus increasing the power of the kicker. Later on Calum relocated the kicker motor a bit lower to lower the weight center which reduced the power, but it can be mounted with an angle (like in design for milestone 1) and this way we can still have a good weight and power balance.

When testing this design, we came across a problem that the robot could not go in a straight line at higher speed. Myself and Marc made some tests with different speeds and tires and came up with temporary solution to use gradual speed increment function together with flat tires, which helped to increase the possible top speed. My personal notices were that motors do not start in parallel. It is possible to see that one motor starts earlier than the other (depends on which order they are programmed in Java code).

My suggestion was to get the ball bearings which I thought would solve the problem of robot veering to the side also to change the axles to ideally straight ones. And it helped indeed although we still have the problem with one motor being stronger than the other which makes one wheel slip when starting to go forward thus still slightly going to one side. We think to fix it by acquiring new motor.

The future plan is to join the strategy planning and movement team and work on actual strategy, since the robot construction will only require minimal changes from now on.