PROGRESS REPORT (WEEK 5)

Project: Design an Autonomous Robot

Task: To design an autonomous robot that is capable of navigating to a predetermined position while avoiding obstacles and firing objects at two targets. This is to be done in the shortest time possible.

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TABLE OF CONTENTS

Gantt Chart………………………………………………………………………………..…………………………………………………………1

Documentation………………………………………………..……………………………………………………………………………………1

Poster Project…………………………………………………………………………………………………………………………………………2

Mechanical Design………………………………………………………………………………………………………………………………….2

Software Design…………………………………………………………………………………………………………………………………….2

Testing…………………………………………………………………………………………………………………………………………..………2

Budget…………………………………………………………………………………………………………………………………………………2

Plans for the following week…………………………………………………………………………………………………………………2

GANTT CHART

The Gantt chart has been reviewed once again, and updated from v3 to v4. In this version update, there are not many changes, since we have been preparing for the beta demo in the previous week (week 4). Thus, only minor calibration were made to the software in order to satisfy the needs of the beta demo. New tasks for the poster project have been made and assigned to different people. Lastly, the dates were reviewed once again. However, there is not a lot of change.

DOCUMENTATION

The four documents have been reviewed this week. There have been changes in terms of content. We have decided to separate the criterion of the beta demo and those of the competition, in order to make the needs of the client easier to follow and more straightforward. In order to do so, every section that differs between the beta demo and the competition has been clearly separated and indicated as such in the document, especially in the requirements document, in the description. The beta demo has a smaller field and is not timed, and thus a separate section has been specifically created for the beta demo description of the requirements in the requirements document.

Lastly, the capabilities document has not been modified this week, since there was no need to do so.

POSTER PROJECT

The UML has been completed. The mechanical design of the robot has changed, so the LDD has been updated to the current version of the mechanical design. Therefore, with the UML and the LDD finished, only the general format and the budget analysis needs to be done. Since the end of the project has not reached the end, we are unable to finish the budget analysis. However, it is updated weekly. Thus far, the weekly budget can be seen in the week 5 budget document in the Dropbox.

MECHANICAL DESIGN

We have decided to go through the middle of the floor. In order to meet the obstacle avoidance requirements, we have added one extra ultrasonic sensor on the left side of the robot (as seen in the LDD of the current version of the robot found in week 5 of the Dropbox). Now, all the ports have been used. This design is final for the beta demo. However, minor details, like the angle of the sensors, may be modified in order to improve the results of the obstacle avoidance in later versions of the code. The caster wheel, however, may have some issues in crossing intersections with large gaps, since it gets stuck between the large grids multiple times during the preparation of the beta demo.

SOFTWARE DESIGN

Minor changes in the code have been made in order to calibrate the robot. During the preparation to the beta demo, the obstacle avoidance needed to be recalibrated in order to avoid the big white cardboard boxes rather than the blocks used in the lab. The speed has also been adjusted in order to make the robot turn properly.

TESTING

The testing of the current version of the robot is mostly completed. The integration test and the speed test have been done. The results were positive for the integration test. However for the speed test, more testing needs be done, since the speed for the obstacle avoidance directly depends on the speed of the robot, which will need much more testing, instead of solely changing the travel speed of the robot.

PLANS FOR THE FOLLOWING WEEK

For the following week, we plan on improving the obstacle avoidance and test the improved version, in order to make it work for a wider range of obstacles, review the different scenarios of the competition, and be ready for the competition.