McGILL UNIVERSITY

ECSE 211: Final Design Project

Constraints Document

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1 SUMMARY

This document is intended to list all the constraints on the design solution. These can involve the environmental constraints that might be specified in the original design description or by the client in meetings, e.g. the operating environment of the device. Note, again, that the information here is only given if it does not already exist in one of the other documents. The document might also point to time constraints for the project and due to the resources. There are also constraints due to the systems available and these come out of the Systems Document. Finally, the budget provides a major constraint on the solution.

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2   EDIT HISTORY

Project: Design Principles and Methods Final Project: Capture the Flag - Team 15
Task: Design an autonomous robot that can play a one-on-one version of the Capture the Flag while navigating through an obstacle course.

2.1   Document Version Number

•   0.0.1: Version presented to Prof. Ferrie on the 2017/10/20

2.2   Edit History
1.   Chloe Grosdidier – 2017/10/17 – Initial creation of the document
2.   Aliah Nazarudin -2017/10/18 - More detailed explanation about current issues and constraints

3   ENVIRONMENTAL ISSUES

The environment, where the competition will take place, presents challenges that need to be accounted in designing the robot. The expected issues are as the following:

●   Changes in light condition that may affect the color values measured by the light sensor.
●   Obstacles placed at certain angles and oddly shaped objects will generate false readings caused by the interference on ultrasonic sensors.
●   The frictional coefficient between the wheels and ground will not be the same with the frictional coefficient during testing. If the coefficient of friction is significantly lower, the robot's wheels will slip very often and introduces error in odometry reading.

4   HARDWARE CONSTRAINTS

The major problem hardware constraint is the presence of flex in join in between the pieces. The flex may cause errors in measurement of the robot such as the wheel base, hence reducing the accuracy of robot's odometer.

5   SOFTWARE CONSTRAINTS

The robot is programmed using Java, Eclipse and LeJOS. We possess all the same constraints that java possesses. We can't program the robot without the LeJOS library and Java. However, we do have the option regarding our IDE. We will use Eclipse for the convenience afforded by the tight integration with LeJOS plugin.

6   AVAILABILITY OF RESOURCES

Time is the most important resource in this project. The project must be completed in 6 weeks and in between these weeks, many milestones have to be met earlier. To ensure the success of the project, meetings will be held from time to time to ensure good communication and cohesion between the team members. However, due to classes and other commitments, every team member is free during the DPM class time slot, hence we decided to have meetings during that time. The whole team will meet the TA on Tuesdays and on Thursdays, we will meet to ensure things are going according to plan.

7   BUDGET

The project delivery date is set to November 24, 2017. The team has approximately 6 weeks to finish the project. In terms of man hours, we have 9 hours per person per week. Therefore, in a team of six, we have 324 man hours to finish the entire project. Every week, the team will spend 54 hours on the project, while the amount of hours of each member will vary every week.

8   GLOSSARY OF TERMS
N/A