CONSTRAINTS DOCUMENT

Project: DPM final project
Task: Construct a robot that can navigate a closed course to se
arch and retrieve colored rings

Document Version Number: 2.0
Date: 28/10/2018
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Edit History:
[18/10/2018] Shaodi: Created Constraints Document
[28/10/2018] Shaodi: Updated budget

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1.0 ENVIRONMENTAL ISSUES

The robot will be operated on a wooden, light brown surface with black lines as grid lines. The robot will also be operated in an indoor lab with constant temperature and humidity, but the ambient light needed to be taken into consideration when testing light sensor.

2.0 HARDWARE CONSTRAINTS

All the available hardware components will be limited to a total of three kits of LEGO Mindstorm EV3. If additional hardware is needed, there are 3D printers available to make them. But the sensors, motors, and batteries cannot be made by 3D printer.

3.0 SOFTWARE CONSTRAINTS

We are constrained to use Java as the main programming language in the whole project. So, all the libraries and interfaces in Java is available to us. And the number of threads is limited with EV3 system. We also need to optimize our code because of limited memory.
The other software constraint is given by the leJOS system. We can communicate to the robot by Wi-Fi, Bluetooth, USB, and also through control panel in Eclipse. By using the control panel, we can also test the performance of motors and sensors. We can also use the console windows and debugger in Eclipse for debugging to enhance our productivity.

4.0 AVAILABILITY OF RESOURCES

The team meeting schedules will be constrained by individual team member's schedules. Our weekly meeting with instructors and TA will happen on Wednesday and Thursday. Other than group work, sometimes individual work will also need to be done. The schedule that the whole team will follow is outlined in the GANTT chart created by project manager. And we will meet primarily on weekends to collaborate to lab. Software and documentation will be collaboratively created using team Dropbox and GitHub. We usually deicide our meeting time and share ideas and concerns using Messenger.

5.0 BUDGET

The Beta demo will take place on November 14th. The source code and all documentation should be delivered in Week 6 around November 24th. Along the way, each team member has approximately 8.5 hours per week to work.

6.0 GLOSSARY OF TERMS