

CONSTRAINTS DOCUMENT

Project: ECSE 211 Final Design Project – Team 6

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[15/10/2017] Justin Tremblay: Added software constraints.

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2.0 ENVIRONMENTAL ISSUES

The robot operates on a smooth, light brown wooden surface with black grid lines separating each square. The robot operates indoors, so the only significant variable element is light levels in the competition environment.

3.0 HARDWARE CONSTRAINTS

The hardware setup is limited to three kits' worth of LEGO Mindstorms EV3 equipment. If any additional connecting parts should be needed, there is the possibility of printing them with a 3D printer. There is no possibility of additional electronic equipment (i.e. bricks, motors, sensors, and wires) - only connecting pieces can be created.

4.0 SOFTWARE CONSTRAINTS

The project must be programmed in Java. Java's compilation process does not allow for much optimization. The computational resources of the EV3 brick are a major limiting factor, especially limiting the maximum number of threads that can be run simultaneously. The small amount of system memory available encourages the use of the smallest possible variable type (for example, the use of a single floating point variable instead of a double floating point variable).

The project must make use of leJOS, a library and operating system for the EV3 brick. The brick can communicate with other devices over USB, Wi-Fi, or Bluetooth. The brick can also

communicate with SSH or SFTP, since it is a Linux-based system. Finally, the EV3 monitoring tool included in the leJOS plugin for Eclipse is also available for use.

5.0 AVAILABILITY OF RESOURCES

The team members' schedules have many conflicts due to class schedules, so most in-person team meetings occur in the evening or on the weekend. Most of the work on the project occurs independently, with team members communicating online using tools like Slack and following the schedule outlined in the GANTT chart created by the project manager. Software and documents are collaboratively created using tools like GitHub and Google Drive.

6.0 BUDGET

The delivery date of the final project is November 24, 2017. The delivery date for the final documentation is December 1, 2017. Along the way, each team member has a budget of 58.5 hours to work on the project.

7.0 GLOSSARY OF TERMS

None required