Step 6 – Baby steps

- Due Nov 23 by 11:59pm
- Points 100
- Submitting a file upload
- File Types pdf

The goal of this step is to program your robot to walk using on board raspberry Pi and controller. All motors should be controlled via the Raspberry Pi using python or any other language.

Program your robot by installing Raspien on the Raspberry Pi, and python. The motion sequence should create some form of locomotion. Avoid high impact and abrupt velocity changes in motors.

Present photos of your printed walking robot in PowerPoint. Include side-by-side images of printed robot and detailed CAD. Plot motor angles as function of time.

Hand in:

A PowerPoint presentation of your printed robot. Include side-by-side images of printed modules and corresponding CAD. Show frame sequence of walking robot, and include movie of fastest gait next to a tape measure. Calculate speed in cm/sec. Provide table with final robot specifications (weight, max speed, etc).

Append this assignment's slides to all previous slides from previous assignments. This assignment should be last, starting with a clear title slide. Save everything as a single PDF and upload the PDF. Any movies should be shown as a representative video frame plus a link to a video online.

PowerPoint Format (Final report)

1. Page 1: Title slide: Robotics Studio MECE 4611, Semester, Assignment 6 – Final report, Full name(s), UNI(s), Date/Time Submitted, Grace hours (before submission, used/gained, after submission), Title of robot, General robot Rendering
2. Page 2-X: Renderings as described above

Grading

Grading of this part is incremental. You get points for various aspects and the more you do the more you get. Maximum 100 points. Following are tentative rubrics you can receive points for:

1. 5 Points Title slide complete
2. 5 Points overall aesthetics, layout and formatting of the slides
3. 8 points glamour photo of working robot
4. 8 points robot moving (frames shown + link to video)
5. 8 points Plotted motor angles as function of time.
6. 8 points Robot speed measured (cm per cycle, cm per sec, robot sizes per cycle)
7. 8 points Robot stability verified in various locomotion configurations
8. 8 points all components properly bolted and connected
9. 8 points 3D-print quality, support structure removed
10. 8 points Robot sanded and painted
11. 8 points Multiple walking patterns tested
12. 8 points Cables routed properly and securely
13. 8 points motors controlled directly from Raspberry Pi
14. 8 points motors powered using battery
15. 8 points post some video of the walking robot on Discussion Boarda (show screenshot, provide link)
16. 8 points post video of your robot on your online portfolio (include screenshot and link)
17. 8 points Robot ongoing health test routine implemented
18. 8 points Robot shutdown routine implemented