ENMT482 Assignment 1

Robbie T. Robot and Marvin P. Android, Group 42

1 Sensor fusion

1.1 Sensor models

Explain your sensor models (calibration plots should go in the appendix).

1.2 Motion model

Explain your motion model. A figure of the estimated robot speed versus the speed predicted using your motion model would be useful.

1.3 Bayes filter

Explain the Bayes filter you used.

1.4 Results

Include plots of how close your estimate was to the true position, for the datasets with true position. Include a plot of your estimate and its standard deviation for the test dataset. If you use a Kalman filter, it would be useful to show the weights as a function of time.

1.5 Discussion

Discuss what worked well and what improvements could be done.

2 Particle filter

2.1 Sensor model

Explain your sensor model.

2.2 Motion model

Explain your motion model.

2.3 Implementation

Explain approach taken and number of particles used, etc.

2.4 Results

Include plots of your estimated trajectory alongside the position from SLAM.

2.5 Discussion

Discuss what you thought worked well about your estimation approach and what you could do to improve it.

3 SLAM

Show the map you obtained from the Lab using the 'gmapping' program and provide your observations regarding 'gmapping''s performance.

Instructions

1. The reports can be created in Word or LaTeX. Use the appropriate template but delete all the instructions in blue.
2. The page limit is five pages with an optional one page appendix. No title pages please. We will deduct 10% for every page over the page limit. Do not squeeze the margin or use small fonts (12pt please).
3. Ensure your names and group number are in the title block.
4. No abstract, introduction, or conclusion is required.
5. Submit your reports as a PDF document through Learn. We will deduct 10% for non PDF documents.
6. Have a read of my guidelines for writing a report, `https://eng-git.canterbury.ac.nz/mph/report-guidelines/blob/master/report-guidelines.pdf`