ENMT482 Assignment 1

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

A Extended Kalman filter

A.1 Sensor models

Explain your sensor models and show your calibration plots.

A.2 Motion model

Explain your motion model.

A.3 Results

Include plots of how close your estimate was to the true position, for the dataset with ground truth. Compare the estimated results using the EKF with the results using the sensors on their own and the results using dead-reckoning.

A.4 Discussion

Discuss what worked well and what improvements could be done. Discuss the Kalman gains.

B Particle filter

B.1 Sensor model

Explain your sensor model.

B.2 Motion model

Explain your motion model.

B.3 Implementation

Explain approach taken and number of particles used, etc.

B.4 Results

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

B.5 Discussion

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

C 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 ten pages. 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`