ROBOTICS

ASSIGNMENT 7

BY

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I

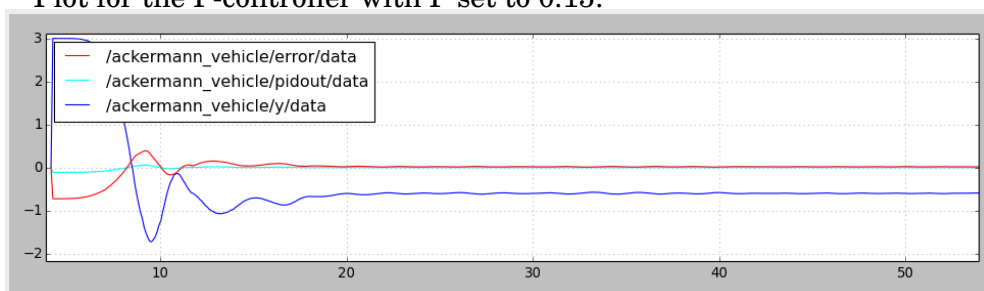# Table of Contents

1 Assignment 7
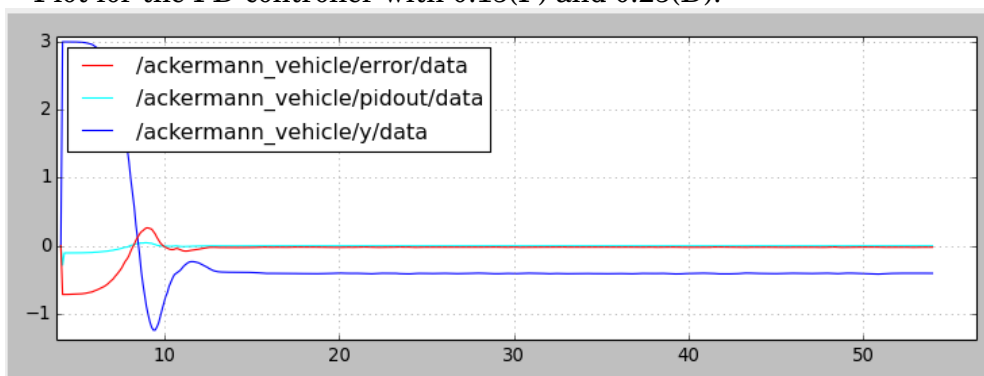
1.1 Task 1

1.1.1 a

In the plots we used three colours to distinguish the results.
The blue lines are the current position on the y-axis, the red ones mark the deviation of the yaw and the cyan ones are the control output.

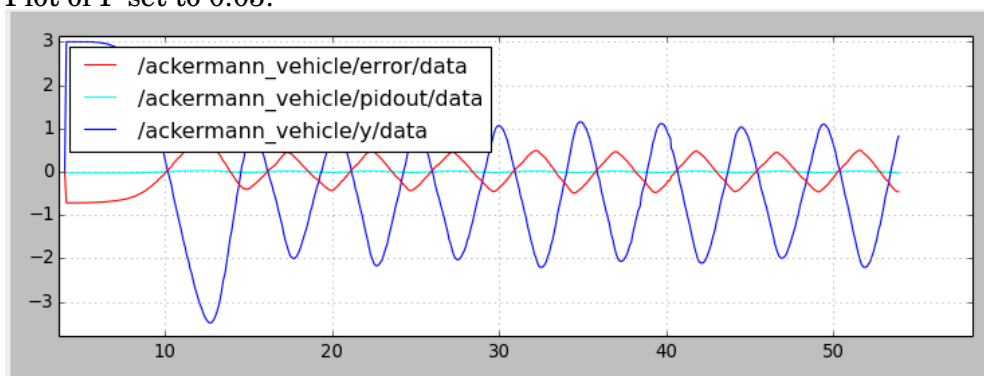Plot for the P-controller with P set to 0.15:

Plot for the PD-controller with 0.15(P) and 0.25(D):

1.1.2 b

Plot of P set to 0.05:

As the system starts to oscillate at 0.05 and has a cycle of almost 5, the following equations determine the parameter for the PID-controller:

$$K_p = 0.6 \cdot K_{p_k} \qquad\qquad\qquad =0.03$$

$$K_i = \frac{2 \cdot K_p}{t} \qquad\qquad\qquad =0.012$$

$$K_d = 0.12 \cdot K_p \cdot t \qquad\qquad\qquad =0.018$$

Plot of PID set to 0.03(P), 0.012(I) and 0.018(D):