The University of Western Australia
Electrical, Electronic and Computer Engineering
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Embedded Systems
ENGT2303

Lab Assignment 6 week 8

Equipment used: SoccerBots

EXPERIMENT 1 "Bang-Bang" Motor Control

Write a motor controller in C implementing Bang-Bang control for a single motor
The program should read a speed value from the input buttons and maintain a constant wheel speed irrespective of changing load.
Follow the algorithm and procedure outlined in the lecture notes!

Display the current encoder value and motor speed on the LCD, using a suitable time interval to see the impulse response of the motor.

Start recording 500 speed values in an array after pressing the button for changing the motor speed. Use another button for transmitting all values as text to the PC via RS232, using the routines `fprintf` or `OSSendRS232`. Make sure to insert a newline after each value.

For receiving on the PC, use the command: `ul filename`.
Use Excel or similar in graph mode for visualizing your results.

EXPERIMENT 2 PID Motor Control

Write a motor controller in C stepwise implementing a PID controller for a single wheel.
The program should read a speed value from the input buttons and maintain a constant wheel speed irrespective of changing load.
Follow the algorithm and procedure outlined in the lecture notes!

Step 2.1
P-Controller (proportional only)

Step 2.2
PD-Controller (add derivative component)

Step 2.1
PID-Controller (add integral component)

Display encoder and speed values on the screen and upload speed values as in Experiment 1.