ME131 Vehicle Dynamics and Control

HW4: BARC System Identification

Assigned: 2/20/2019 Due: 3/1/2018, 11:59pm (On bCourses)

Please submit your homework solutions on bCourses as a single PDF of your solutions. When videos are required, please only submit the link as part of the solution PDF document. Late homeworks will not be accepted.

Problem 1 Lab Deliverables (30pt)

1.1 (5pt) Transfer function $G_{pwm \to v}(s)$ from Task 1.8.d.

1.2 (5pt) Plots comparing your recorded velocity data against your best-fit transfer function from Task 1.8.e.

1.3 (5pt) Transfer function $G_{pwm \to v}(s)$ from Task 2.5.b.

1.4 (5pt) Plots comparing your recorded velocity data against your best-fit transfer function from Task 2.5.c.

1.5 (5pt) Your derivation of the formula for calculating the steering angle as a function of the vehicle's longitudinal speed, wheelbase length, and yaw rate from Task 3.1.

1.6 (5pt) Plot of your servo PWM input vs. resulting steering angle (in degrees), including your line of best-fit, from Task 3.7.