ME 333 Assignment 11

Xuedong Fan

March 19, 2025

Department of Mechanical Engineering

Northwestern University

Chapter 28.4.10

My Best ITEST results with the parameters Kp = 0.1 and Ki = 0.05.

The result of the PI current control is a new current, therefore Kp and Ki has no unit here, because

$$\frac{mA}{mA} = 1$$

.

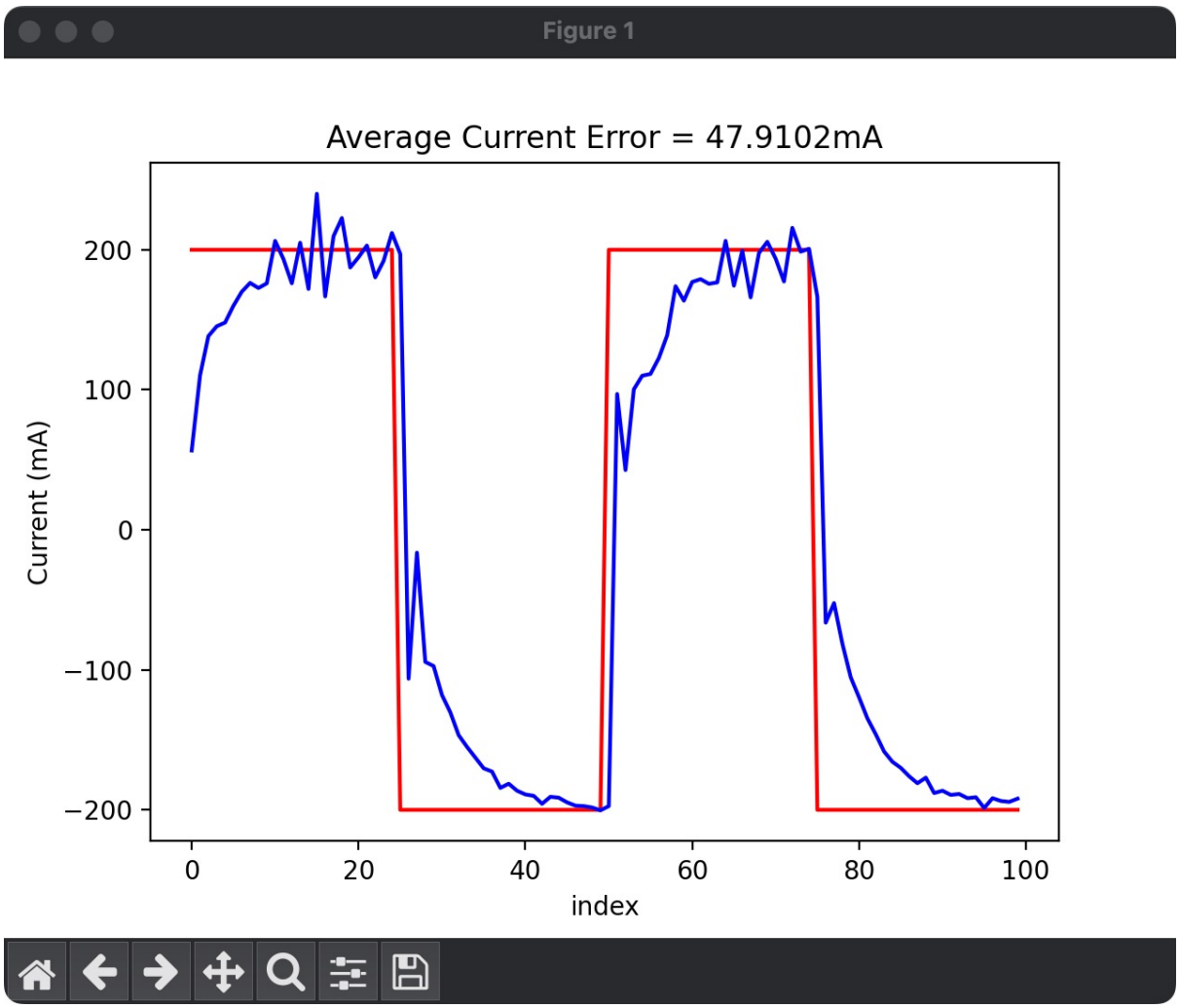

Figure 1: Best Itest plot

Chapter 28.4.12

The Cubic Trajectory goes with a Kp = 1, Ki = 0, and Kd = 0.5. The unit for all three parameters should be ma/deg, because they times with the error with a unit of deg and gives the desired current in mA. There's a obvious delay at the beginning, and any Kp larger than 1.5 leads the system out of

control in the end.

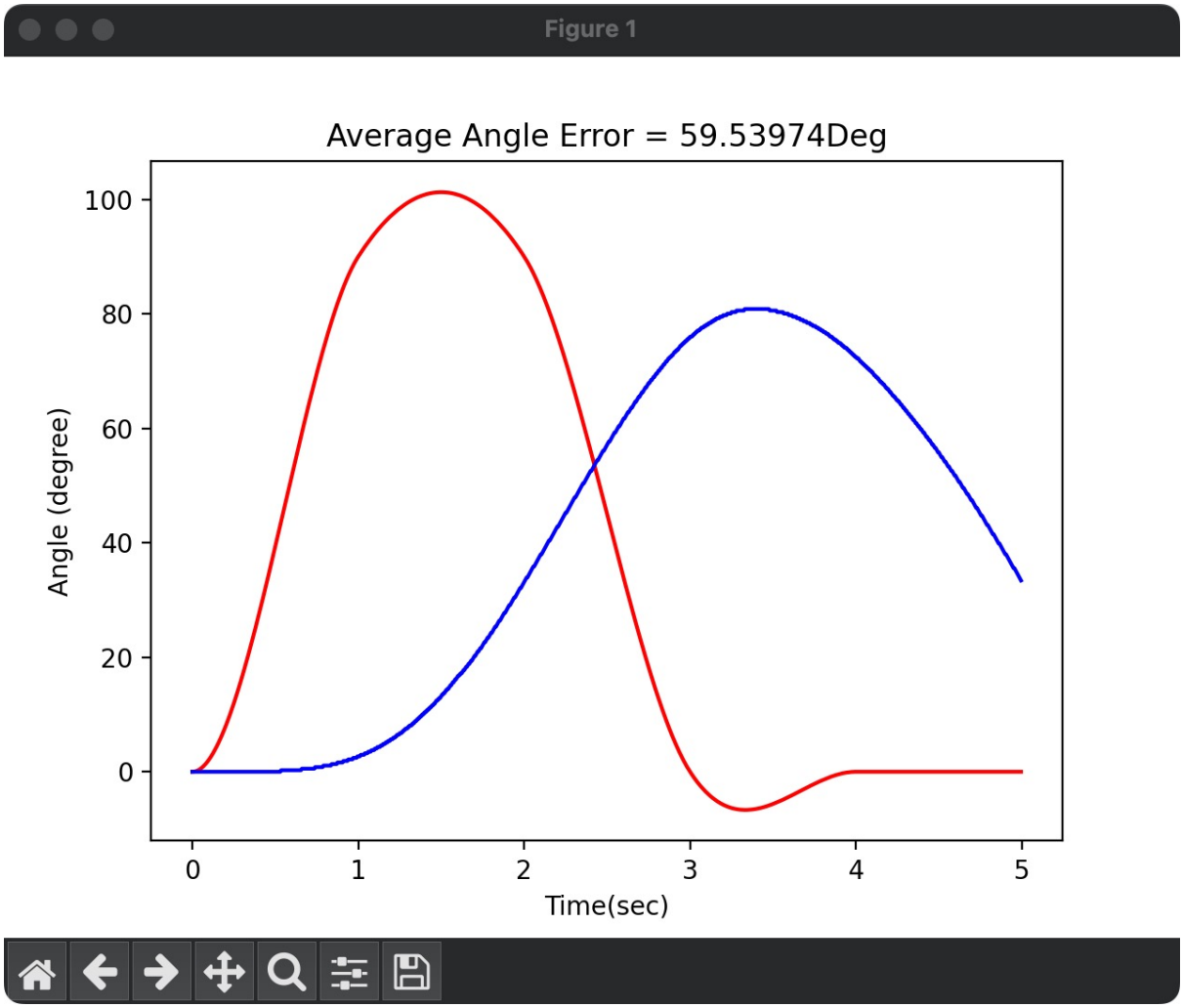

Figure 2: Cubic plot

Same error gain value for the Step Trajectory, Kp = 1, Ki = 0, and Kd = 0.5.

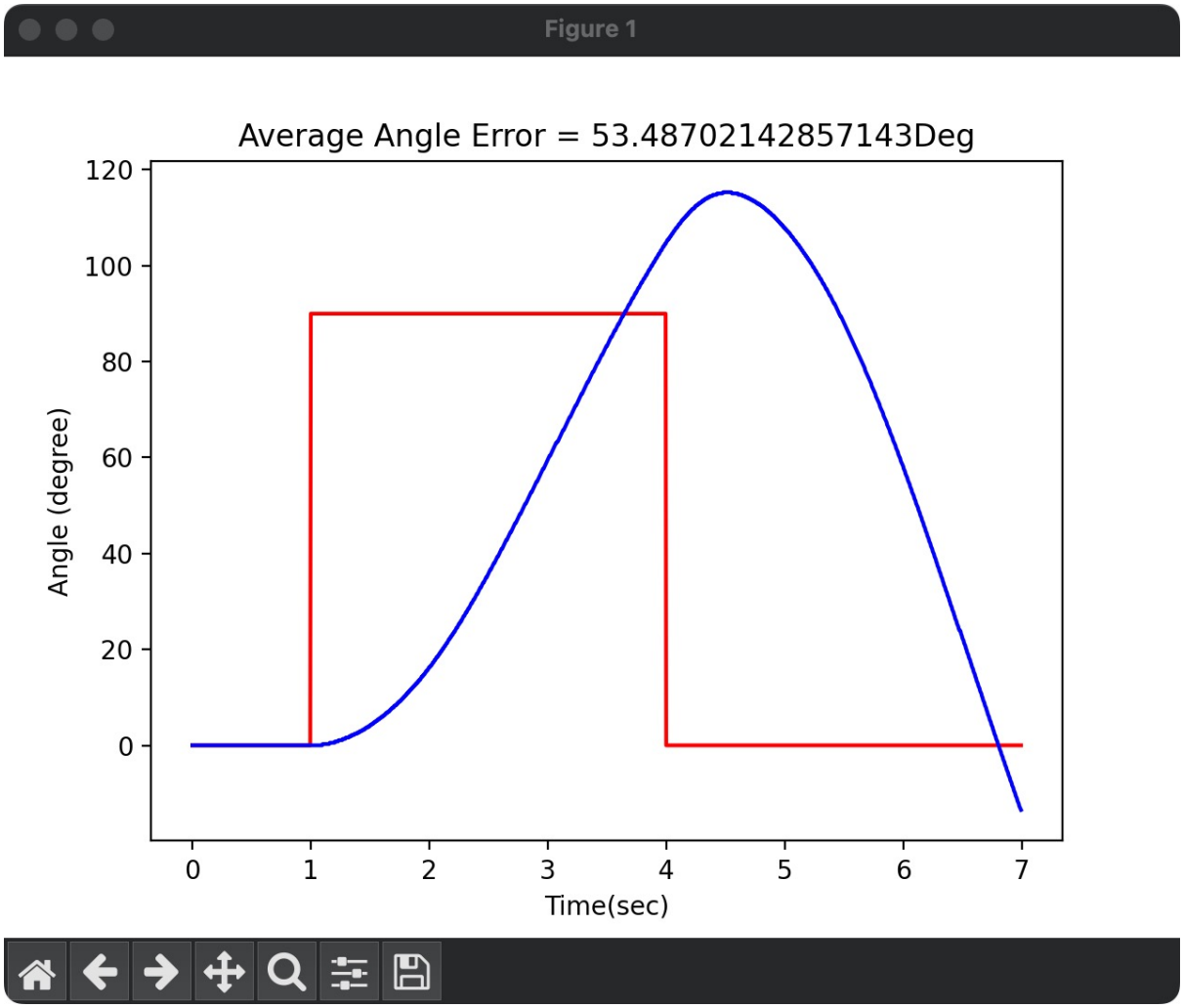

Figure 3: Step plot