Tyler Johnson – ELEC3024 Logbook

# Week 9

Most of week 9 was spent organizing with my team, establishing communication channels and sharing document access to facilitate collaboration. Not much work was done on the project itself, as we were unsure how best to start with the project.

# Week 10

Week 10 was spent determining the open loop transfer function of the DC motor using the datasheet as reference. We were advised by the tutor to consult the Control Tutorials for MATLAB and Simulink website, and to work through the steps outlined there to get started. With this information we were able to use the datasheet to model our motor in MATLAB and measure the step response. As shown below:

A graph and diagram of a graph

Description automatically generated

# Week 11

Started modelling PID step response

# Week 12

Throughout week 12 myself and the rest of my team made efforts to come in outside of class and try to get the hardware working with Simulink. Many teams struggled with this, we tried multiple Arduino boards, multiple controllers, and multiple motors with no change. We were able to communicate with the Arduino using Arduino IDE, and Simulink verified that the Arduino was connected, but some other issue prevented us from using our hardware.

We were able to use another team’s hardware that was working to take our measurements using our motor controller design, this let us complete the hardware aspect of the project. We tweaked the parameters used to control the motor in situ, in order to get the desired response in the real world. We noticed noise at steady state that appeared to coincide with the PWM signal being sent to the motor, as the duty cycle the motor is being driven at is 50%. The average speed measured matched our expectedly low steady state error, this is something that could be accounted for in the future.

# Week 13