Lab 2 Experiment Steps for AAE364L Fall 2020

September 5, 2020

1   The Lab steps to experimentally determine w_p

i. Open matlab, and make sure the working directory is set to your section's working folder
Desktop $\rightarrow$ AAE364L_Fall2020 $\rightarrow$ Date_time_sectionXXX $\rightarrow$ lab2
where Date_time_sectionXXX is your specific date and time of your lab session

ii. Run the setup file **setup_ip02_spg.m**. Make sure the type of pendulum is set to PEND_TYPE = 'LONG_24IN'

iii. Open **labgantrywp.mdl** in Simulink

iv. In the Simulink window, set simulation time to 19 seconds.

v. Secure the cart at the center of the track.

vi. Click **Quarc - Build**. Select **Simulation - Connect to Target**, and **Quarc - Start**.

vii. Move the pendulum about 15 degrees and let it swing. Make sure to hold the cart down to the track so only the pendulum is swinging, and the cart is stationary

viii. After the pendulum swings about ten revolutions, click stop.

ix. Save the angle history and cart position structs in MATLAB (File - Save - Save as Mat file).

2   The Lab steps to pole placement

   i. Make sure the type of pendulum is set to PEND_TYPE = 'LONG_24IN'

   ii. In the MATLAB command window, enter your best values of K from your Simulink design, that is, set $K = [K(1)\ K(2)\ K(3)\ K(4)]$

  iii. In the same directory, open **labgantrypp.mdl** in Simulink.

  iv. Put the cart at the center of the track.

   v. Click **Quarc - Build**. Select **Simulation - Connect to Target**, and **Quarc - Start**.

  vi. Have the TA tap the pendulum. After the pendulum and cart stop moving, hit the stop button.

 vii. save the angle history and cart position structs in MATLAB (File - Save - Save as Matfile). Close the Simulink model, don't save changes.

viii. Email a zipped folder of ALL your data to yourself to use outside of the lab (Outlook does not like .mat files, so you have to put your data into a separate folder, zip it up, and send the zipped folder to yourself)