Washington University in St. Louis
ESE447
Robotics Laboratory

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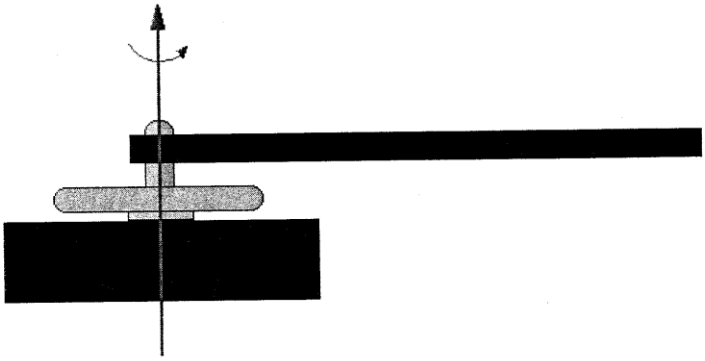
LAB ASSIGNMENT – Single Link Position Control
TESTBED: Quanser Power Plant with single axis link



TASK OBJECTIVE: Use Simulink in conjunction with the Quanser interface modules and the above testbed to gain insight into closed-loop position control, expand experience with Simulink, and gain familiarity with simulation control.

TASK: Use Simulink with Quanser interface blocks and create a system which oscillates the link between -45^o and 45^o.

REQUIREMENTS:

- Solve this problem using switch blocks, digital logic blocks, etc. (No PID/or state space type controller).
- The solution should stay between the stated degrees. If it is disturbed/or moved outside of this range, it should then recover on its own.
- This should be completed in two consecutive class periods (4 hours).

QUESTIONS:

- Could you use this system as a position control device?
- What is the shape of the motion when looking at the position using the scope?
- Can you control the shape of the motion while oscillating?
- What can you say about the speed of the link throughout the entire oscillating region? (Think about this in terms of the amount of energy being delivered to the motor.)
- Can you predict the shape of the motion if the SRV-02 unit would be tipped on its side?
- Does this controller have any predictive nature?