Recommended Assessment

Block Diagram Modeling

1. The motor shaft of the Qube- Servo 3 is attached to a *load hub and a disk load*. Based on the parameters given in the Qube-Servo 3 User Manual, calculate the equivalent moment of inertia that is acting on the motor shaft? (Refer to concept review and application guide)

2. Attach a screenshot of your block diagram model and the parameters used.

3. Attach a screenshot of the measured and modeled responses. You may notice your model does not match the measured system exactly. Give some possible sources of any discrepancy between the two responses.

4. Formulate the differential equation for the angular velocity (rotational speed) ω_m of the motor using the equations from the Concept Review.

5. Take the Laplace Transform and find the voltage to speed transfer function, $\Omega(s)/V_m(s)$, of the system. Evaluate the transfer function numerically.