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ECE 5780

Post Lab 7 Questions

1. What gain parameters did you end up using for your PI controller?

- **Describe the response of the system to speed changes.**

The gain parameters that were selected embody a 2:1 correspondence between encoder counts and the resultant RPM, signifying that one revolution per minute is equivalent to half an encoder count, with an interrupt interval delineated at 37.5 milliseconds, or 37,500 timer ticks. This relationship informs our system's response dynamics, particularly as the velocity approaches the designated target RPM. The interplay of the integral (Ki) and proportional (Kp) gain coefficients plays a crucial role in this context. Initially, we nullify Ki to isolate the influence of Kp, adjusting it to achieve a state of equilibrium in the motor's velocity. Subsequently, Ki is methodically modulated to refine the control mechanism, enhancing both the smoothness and precision of the system's response to deviations from the target RPM. The ARR is made from (timer ticks) / 2 which is 18750. To advance the precision of the PID-controlled motor further, we contemplate the incorporation of a derivative component within the PID schema, aimed at moderating the oscillatory tendencies inherent to the system's dynamics.