Project: 5-Page Draft

Due Next Week – No Electronic Copies will be graded

Preamble: The objective for ME 639 is to design a closed-loop controller for a DC motor. Such design demands skills in software, hardware and control theory. For software skills, primers in LabVIEW programming were provided. For hardware, analog and digital I/O (with USB-6211, optical encoders and motor power op-amp) labs were executed. For control theory, PID and system identification lectures and labs ere given. The net effect is that one now has all the tools and knowledge to begin and complete the course objective. This Project (worth 25% of one's final grade) serves to reinforce these concepts and assess one's understanding and implementation of closed-loop control.

Students (working independently) will submit a 5-page hardcopy DRAFT **due 11/26/07** in class. This DRAFT counts for 10% of the final project grade and serves to give the student preliminary feedback towards writing the FINAL REPORT. The 10-page FINAL REPORT and live demo are due in class 12/03/07.

5-Page DRAFT Outline (Sketches, photos, diagrams for each section are highly encouraged)

1. Introduction (0.5 page): Project motivation, goals, objectives
2. Theory (1.5 page): System block diagram, transfer function, simulations
3. System Description (1.5-page): Name and purpose of each component, system setup procedure (e.g. wiring diagram)
4. LabVIEW Programming (1-page, not including screen shots): Describe how the program works. Explain purpose of main pieces of the code.
5. Results (0.5 page): Open-loop response (time constant, steady-state response. Comparison to simulation)

Recommendations: The DRAFT is limited to 5-pages but take lots of photos and screen shots. It is always easier to delete these if you don't use them instead of setting up the experiment each time you forget to add a photo.

The 10-page FINAL REPORT essentially adds

6. Closed-Loop Control Theory and Simulation
7. Experimental Results (effects of integral and derivative action i.e. stability vs. performance)
8. Conclusions