

Project Report Guidelines

The final report does not need to follow any specific format, but I know that total freedom is a very scary thing, so here are some guidelines...

I. Introduction. Discuss the system used for the project: the components, the required trajectory, and the general types of controllers to be used.

II. Transform-Based Design.

A. Controller Design. Discuss each controller you designed—in particular *why you made the choices you did* when selecting controller parameters. The controllers include

- Lead compensator
- PD controller
- PID controller
- PIDlead controller

B. Simulations. Discuss the Simulink simulation you prepared to test your controllers, and compare the results of the simulations.

C. Experimental Validation. Discuss the experimental validation of your controllers in the laboratory. In particular, compare and contrast the plots of experimental results with those of your simulations. Our final “figure of merit” was RMS error, so include that as well.

III. State-Space Design.

A. Controller Design. As before, discuss the design of the state-space controllers and explain your reasons for your design decisions. Here the controllers include

- SISO controller
- MIMO controller

B. Simulations. Discuss the Simulink simulation you prepared to test your controllers, and compare the results of the simulations. Here you may want to compare the results of your state-space controllers to the transform-based you did earlier.

C. Experimental Validation. Discuss the experimental validation of your state-space controllers in the laboratory. Compare and contrast the plots of experimental results with those of your simulations, and compare with the transform-based controllers.

IV. Conclusions. Based on your experiences of designing and validating these several transform-based and state-space controllers, express your opinions about the design methods and relative performance.

I would appreciate neat, readable reports. Please try to make your report “flow” so I can follow the thread of your reasoning. Put any detailed calculations and program listings in an Appendix. Thank you!