LaTeX Lab Report Skeleton

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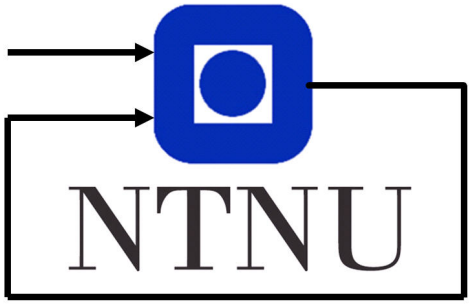

Department of Engineering Cybernetics

Contents

A lab report describing what has been done in this project work should be handed in after the project work is completed. For each part of the exercise the report should include:

- Printouts of data from relevant experiments (plots).
- Relevant model derivations, calculations and parameter values (remember to include units and scaling).
- Discussion and analysis of the results.
- Simulink diagrams and MATLAB code(that you've made youself! No templates).
- Questions introduced with "For the daring" are optional, but answering them correctly shows good understanding and will give bonus points. (These are not necessay to get full score)

Evaluations are based on:

- documented calculations,
- experimental results,
- analysis and discussion of the results,
- answers to questions in exercise sheet,
- and the quality of the written documentation of the results will be emphasized.

You should delete this page. It should not be part of your final PDF!

In the following pages, we have written a skeleton that you should fill in. The italic text is only for extra guidance and should be deleted.

There should not be a need to add any other (sub)sections.

Unless you have a very good reason not to, you should write the report in English. If you want a larger example on how to use LaTeX, have a look at the template that was used in TTK4115 and previously in this course as well: `https://github.com/ntnu-itk/labreport`.

1 10.2 - Optimal Control of Pitch/Travel without Feedback

1.1 The continuous model

Answer 10.2.1.1

1.2 The discretized model

Answer 10.2.1.2. Remember to document the calculations.

1.3 The open loop optimization problem

How is it formulated?

1.4 The weights of the optimization problem

Plot both the state and input trajectories for the various weights, q. Comment the results with respect to the different weights chosen. If you have answered the "For the daring" questions from 10.2.1.3, include the answer here.

1.5 Experimental results

Printouts of data from relevant experiments (plots). Discussion and analysis of the results. Answer 10.2.2.7 here.

1.6 MATLAB and Simulink

Code and diagrams go here (only lines that you've written yourself). Give some explanation of the code if necessary.

2 10.3 - Optimal Control of Pitch/Travel with Feedback (LQ)

2.1 LQ controller

Briefly explain LQ controller. Especially, but not limited to, what is the role of the matrices Q and R? Justify your choice of weights.

2.2 Model Predictive Control

Answer 10.3.1.3 here. ("For the daring" is optional)

2.3 Experimental results

Printouts of data from relevant experiments (plots). Discussion and analysis of the results. Answer 10.3.2.5 here.

2.4 MATLAB and Simulink

Code and diagrams go here

3 10.4 - Optimal Control of Pitch/Travel and Elevation with Feedback

3.1 The continuous model

Answer 10.4.1.1

3.2 The discretized model

Answer 10.4.1.2

3.3 Experimental results

Printouts of data from relevant experiments (plots). Discussion and analysis of the results. Answer 10.4.2.6 here.

3.4 Decoupled model

Answer 10.4.2.7

3.5 MATLAB and Simulink

Code and diagrams go here

3.6 Optional exercise

What constraints did you add? What were the results? Plots? Discussion?