

Dear students,

Here comes quite a long message concerning the final steps you need to take to successfully complete the Integration Project. Read carefully the WHOLE message and feel free to ask if something is not clear.

Deadlines:

- 1) Prepare the final written report. Deadline: Friday June 22, 2018 by 16:00.
- 2) Prepare the presentation which you will give on June 26 or 27, 2018, in room C, faculty 3mE.

More information on the presentation

Here is the program for the two days:

http://www.dsc.tudelft.nl/~sc42035/transp/ip17_presentations_schedule.pdf

We have respected the exam constraints you gave us, but mistakes may creep in, so, please, do check your time slot and mark it in your calendar. Let us know immediately in the case that something is not right.

Apart from the session in which you are presenting, you should be present in at least one another session of your choice. Feel free to attend more - it is interesting to learn how others identified models and designed controllers for their setups. The presentations are one of the most enjoyable parts of this course!

Bring your presentation on a USB stick or bring your own laptop (do not have the file only in the cloud, the net can be down or other mishaps can happen). Use PowerPoint or PDF; when using PowerPoint, it's always good to export it to a PDF file as a backup. Embed movies in the presentation file, if you are planning to show some and have them also as separate files.

The audience are mainly your fellow students who went through essentially the same control design process. Therefore, they have a good knowledge of the general steps and the methods, so there is no need to present a slide showing the general steps you have taken (modeling, identification, ...). Present the design specs, methods, choices, considerations, results, etc. that are interesting / unique from the point of view of your setup. The lessons learnt - both in terms of successes as well as failures are interesting to share. Evaluate and analyze your results. Movies are welcome. Pay attention to the clarity and legibility of graphs, including the choice of colors and letter size. Do not use too many itemized lists, they tend to be boring. Plan to speak for **at most 12 minutes**, so that there is some time for questions. Both members of the group must present. At the end of the session, we will give a brief feedback on your presentations.

More information on the report

The main criteria for the report are completeness and clarity. On the basis of the report, any educated reader should be able to reproduce your results with the laboratory setup. All choices made must be properly motivated. Evaluate critically the results obtained. Stick to the 30 page limit!

Writing tips

Content:

- Make sure to present sufficient information about the choices you have made and their motivation (for instance, the sampling period, controller design specifications such as the settling time, overshoot, etc., and the identification methods used, etc.)
- Modeling: derive the equations of motions. Present the main steps of the derivation, do not oversimplify, the reader must be able to follow the derivation.
- System identification: do not forget to report the validation results for your model.
- Control: compare simulation results with the results of real-time experiments. Simulate the closed loop using the nonlinear model of the process.
- Plot all the important signals (do not forget the control input). Discuss the results, draw conclusions.
- Please, do not present theory that can be found in the literature (books, lecture notes, papers), just cite the source.

Form:

- Follow the usual structure of a technical report (including an Introduction, Conclusions, etc.). Include a Table of Content.
- Do not use scanned formulas or tables. Note that typesetting a formula in Word or LaTeX typically takes less time than scanning it.
- Do not use the “Matlab” ...e-5 notation, use $\times 10^{-5}$ instead (`\times` or `\cdot` in LaTeX).
- Terminology: use established technical terms and symbols as much as possible.
- Explain the meaning of all symbols - mathematical symbols must be explained at their first use and your document should preferably include a list of symbols.
- When comparing two or more signals (e.g., model output and data) display them in one plot, using different line types (not only colors, your reports can be printed in black and white). Explain the colors / line types. The scale of the plots must be carefully chosen in order to clearly convey the information intended.
- Label properly the axes in graphs (variables and units). Replace the standard Matlab label “Amplitude” by the respective quantity displayed. Make sure that the axes labels are not too small.
- In the text and figure labels or captions, units are typeset in Times Roman (not italics), functions like sin, cos, etc. are typeset in Times Roman, not italics (in LaTeX, use `\sin`, `\cos`, etc.)
- Figure captions are below the figures, table captions above the tables.
- Block diagrams must be explained (the function of the blocks).
- Statements like “the prediction-error method is used” are not informative, there are many such methods, be more specific.
- Strive for elegant, concise text - longer reports do not necessarily yield higher grades.
- Number the pages and check for broken or undefined references (?? in LaTeX).

English language:

- Do not use short forms, like “isn't”, “wouldn't”.
- Do not use colloquial style, like “a couple of”.
- Spell check and proofread your report.
- The use of initial capitals in chapter and section titles must be uniform throughout the report.
- When referring to sections, figures, etc., capitalize, like: see Figure 1.
- Some typical mistakes:
 - Words like openloop model are written with a dash: open-loop model
 - “More easy”, “more simple”, etc. should be “easier”, “simpler”, etc.
 - There are no spaces before commas, like in the above phrase.
 - However, there is a space before an opening parenthesis (...), not like this(...).

The report must be delivered on paper - two copies in a dedicated box, which will be placed in the vicinity of the mailboxes on the first floor, next to the DCSC secretariat. Please, do not bind the report, just staple it with one staple in the upper left corner. This will make it easier for us to handle and read. Along with the two hardcopies of the report, please, send a PDF of the report and a zip with your Matlab and Simulink files by e-mail to R.Babuska@tudelft.nl and J.Kober@tudelft.nl.

Grading:

Your grade will be determined on the basis of your report (one report per group), the final discussion and the presentation. The weights are 0.4 (report), 0.4 (final discussion/defense) and 0.2 (presentation).

When grading the reports, we explicitly check the following items: control objectives, modelling and linearization, sampling frequency, system identification, observer, two controllers, comparisons, conclusion. There may be a bonus for e.g. an additional controller, nice insights, etc. In terms of the report form we look at: structure, clarity, English, level of detail, figures and tables, citations.

Good luck with completing the project!

Best regards,

Robert Babuska, Jens Kober and Sander Bregman