

Regarding the final report in DAT096 spring 2018.

(Originally written in 2015, updated 2017-04-18 and 2018-04-15)

The final report is an academic report.

The report should fulfil the HISS criteria [1]. I will not here repeat everything that is stated in these criteria here.

There is no page limit or required number of pages. You are to use your own judgement on what material to include or exclude.

However, note that longer is not necessarily better!

There should be no program code in the text. Possibly it could be placed in an appendix if you feel it has to be included, but we think code should generally not be included in an academic report.

Additional requirements

There has to be an informative abstract. It should be placed before the table of contents.

There should be clearly numbered chapters and sections.

Each chapter should start on a new page.

Use informative chapter and section headings.

Try to avoid having more than three numbered subheading levels. (If you need more than that you probably need to restructure your report).

Bibliography

There should be a bibliography with some scientific publications.

The references in the bibliography should be in the IEEE style [2][3].

Each reference included in the bibliography should be cited in the text.

For online references you should include access dates (you may have to put them as notes in the BIBTEX input).

(Read more about how you can update the ieeetran style to include access dates in this blog entry [4].)

Citations within the text should also be in the IEEE style [2]. Citations should be placed before the period in a sentence.

There should be a space before the citation. It is good practice to use a non-breaking space there.

Figures and tables

Make sure that diagrams and graphs are as clear as possible. Scale graphs to show the parts that are of interest. Any text in diagrams or graphs must be readable or should be omitted. Avoid screenshots if at all possible. Avoid output from design programs if possible, since it usually has many unnecessary details that will just confuse the reader. Label axes in graphs and include units in brackets. Do not include any titles with graphs. The explanation should go in the caption instead. It is possible to use cropping in LaTeX if you cannot remove the title otherwise:

<https://tex.stackexchange.com/questions/52695/cropping-trimming-an-image-with-includegraphics-by-specifying-percentages>

Make sure legends are placed so they do not interfere with the data in the graph. If you use visuals from other sources you must reference them also in the caption. Since the DAT096 reports are only created for educational purposes, and will never be published, it is OK for you to use copyrighted material as long as it is referenced. However, for theses that are made publicly available you have to have permission to use any copyrighted material.

Refer to figures and tables in the IEEE style. For figures and tables this means "Fig. Y" and "Table X"

Each included table or figure should be referenced in the text.

Captions for figures should go below the figure.

Captions for tables should go above the table.

However, you do not have to follow the numbering and formatting of tables and their captions from the IEEE style.

Captions should be informative; that is they should explain enough about the figure or table at hand that the reader does not have to refer to the main text to understand what is in the table or figure. However, the discussion of what can be concluded from the figure or table should be in the main text.

Equations

We prefer that all equations are part of the text - also the displayed ones (that is those that go on a separate line). Put them in the place where they should come logically when you read the text out. Here is one example:

"Ohm's law was derived as

$$U = R \times I \quad (4)$$

where U is the voltage, I the current and R the resistance."

All equations that are referenced should be numbered. It is preferable that you number **all** displayed equations.

References to equations should also be in the IEEE style, that is with its number within parenthesis only (do not include the word equation, Eq. or similar) :

"We find that that Ohm's law (4) can be extended by adding the...."

or

"We find that (4) can be extended by adding the....."

When the equation comes right afterwards in the text you should not refer to it by its number but rather make it part of the text.

Quantities

Quantities should be typeset with the unit in roman font (that is not the default font in the math mode in LaTeX) and a space between the number and the unit. I highly recommend that you use the LaTeX package `siunitx` for typesetting numbers, units and quantities. Then you will never again have any problems with the space between the number and the unit. There will be no ugly line breaks and it will look consistent within your entire report. If you use `sharelatex` all you have to do is to include this line in the beginning of your file:

```
\usepackage{siunitx}
```

Then when you need to write number with units all you do is `\SI{3.3}{V}` or `\SI{45}{Nm}`. The package can also do many other really good things, but you will have to read the documentation to find out about those. Decibels are treated as a unit even though it is not really: `\SI{100}{dB}`.

Percent

In the IEEE style percent should be written out as “percent” in the running text, while the percent sign is to be used only in tables, captions etc. We are OK with percent sign also in the running text as long as you are consistent within the entire report. In English the recommendation is most often to use no space between the number and the percent sign, although the SI standard prescribes a space. So we will allow either, as long as you are consistent. It actually works to use `\SI{50}{\%}` to typeset percentages and get the right SI space there too. I just found that out!

Good examples

A great example on how to incorporate equations in text is the recent Immersive linear algebra textbook [6] written by three professor at Lund University. It also has many good examples of how to use active voice in a technical subject. Note that it does not use the IEEE style referencing of equations though.

Sanjoy Mahajan is an author who writes very well about mathematical topics. I recommend both his textbooks for studying mathematical writing; I also recommend them because they are thought-provoking and useful books from which one can learn about mathematical thinking. The two books are “Street-fighting Mathematics” [7] and “The Art of Insight in Science and Engineering” [8]. And conveniently both books are available under open access so you can just download the pdf files. Sanjoy hates the passive voice so I think you are unlikely to find many sentences that are not in the active voice in his books.

References

- [1] HISS criteria. Chalmers fackspråk. Available on the course web page
- [2] IEEE citations guide. Available on the course pingpong page. From IEEE originally
- [3] IEEE citation style guide. Available on the course pingpong page. From IEEE

originally

[4] http://www.owenstephens.co.uk/blog/2010/03/28/add_accessed_date_to_ieeetran_bibtex_style.html

[5] IEEE tables and figures example. Available on the course pingpong page. From University of Utah originally

[6] J. Ström, K. Åström and T. Akenine-Möller. Immersive Linear Algebra <http://immersivemath.com>

[7] S. Mahajan. 2010. *Street-Fighting Mathematics: The Art of Educated Guessing and Opportunistic Problem Solving* <https://mitpress.mit.edu/books/street-fighting-mathematics>

[8] S. Mahajan. 2014. *The Art of Insight in Science and Engineering: Mastering Complexity*. The MIT Press. <https://mitpress.mit.edu/books/art-insight-science-and-engineering>