General remarks
Before starting to write
Getting started
Writing the main text
The "after-work"
Oral presentation

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Writing and presenting degree projects in Mathematics and Mathematical statistics

Tom Britton, tom.britton@math.su.se
Stockholm University

March, 2017

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General remarks

Unlike our subject (mathematics) there is no exact *right* or *wrong* in writing and presenting

The more you write/present – the better you get!

This lecture is about the "package" – not the mathematical content

The "package" is equally important for reaching out!

The lecture is **not** about software (LaTex or similar – there are templates on home page)

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Before starting to write

Procedure: Preparation – writing – revision

Things to consider when preparing:

- Who is the typical reader? Should be student colleagues
- What are the main messages? (Not too few or worse, too many) Write them down!
- What is good notation to be used?

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The "decreasing rule"

Keep in mind the decreasing or "half-time" rule:

Out of all people that read the title

- 50% read the abstract
- 25% read the introduction
- Half of readership is lost with each section
- < 1% read the appendices

I think these numbers are **very optimistic** ...

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Consequences

The title is very important: to deliver the main message AND to attract the reader

The abstract is very important: should contain the main messages and a bit about methodology

The introduction is very important: I think it shold contain a very short background, a statement of the problem(s) treated, a presentation of the results and description of the rest of the paper

Have the "decreasing rule" in mind: someone who reads 1-2 pages should benefit from the paper!

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More things before getting started

Who should be author? Nearly always only one author in degree projects

Who/what should be acknowledged?? Supervisor, others who have contributed, ...

English or Swedish – you decide (usually also abstract in "opposite" language)

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Getting started

The first thing to do: write a **skeleton** ($\approx$ list of contents)

The skeleton should contain the different (sub-)sections

The skeleton should also contain a description of what parts come in the different (sub-)sections (relating to the "main messages")

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A common structure of a mathematical paper

- Title, authors and abstract
- Introduction (possibly also containing main results)
- The model/problem (+ what have others done – references)
- one or more sections of theory
- illustration/application/numerics
- Discussion/conclusion: What has been done, possible alternative routes and extensions, why are the results interesting and how could they be improved even more
- Appendix (sometimes placed after references)
- Reference list

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Writing the main text

It's ok to leave out some technical bits at first to keep *logical line* in writing procedure

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Minor comments

- Don't use complicated/specialised language

- Equations are part of sentences!!!

- Use, but don't over-use, bold face and italics

- Don't start sentence with mathematical symbol

- Avoid abbreviations

- Number only equations that are referred to

- Try to make the text "flow": leave less relevant technicalities to appendices (or technical sections)

- Admit or give reference where logical steps are left out

- Don't use phrases like: "it easily follows that ..." better with: "standard but tedious calculations reveal that ..."

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More minor comments

- Avoid too **much** mathematical notation

- Mathematical notation should be logic and easy to remember

- Use words rather than math-symbols in running text: "Pick an element x in X" rather than "Pick $x \in X$"

- Lemma – Theorem/Proposition – Corollary

- Use "I" or "we" in text? I prefer "we" even if only one author: We = I and the reader

- Use figures, tables etcetera – it makes the text look more varying (beside explaining/illustrating something)

- All figures/tables and similar must be referred to in text

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More minor comments

- Use capital letters when referring to figures, theorems, and simimlar: "... as shown in Figure 3 ..."

- Use spell- and grammar-check

- Use active (not passive) form in sentences

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Specific remarks: Title and abstract

- Should be written "afterwards"

- **Title**: spend time deciding this! It is very important

- **Title**: should be informative, "catchy" and short (hard ...)

- **Abstract**: should both give the main result and attract the reader

- The abstract is not part of the paper: something defined in the abstract must also be defined in the main text

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Specific remarks: Citations and references

- There are different ways of referring and writing reference list. Be consistent

- Better with too many than too few references

- All items in reference list must be cited in text

- Direct the unfamiliar reader to some background text covering "your" area

- Avoid citing unpublished work

- Give page reference when citing books

- **Don't quote/copy (e.g. from web) without citing. This is criminal!!!!!!**

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Specific remarks: Discussion/Conclusion section

- Should summarize main results (repeat the important!)

- Mention the strength of the results

- Mention also what can be done better, extensions and open questions

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Specific remarks: Appendix (and technical sections)

- Here you can be more technical/advanced

- Should contain material that is not central and would stop the "flow" in the main text

- Each appendix should start with what it is about

- Each appendix should end with the result that is referred to in main text

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After the first draft written

- Leave the manuscript for a few days (otherwise you are "blind")
- Then go through it:
    - First look at the general structure: is everything there?, adequate level of detail?, easy to follow the logical line?, can something be removed?
    - Then go through the manuscript in detail
    - Pretend you are a typical reader of the journal in question
    - Change whole paragraphs rather than sentences
    - Focus more on removing than adding things!
- If several authors: read and comment each others' contributions
- Repeat everything above (at least) once more **Date versions!**

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After the second and third drafts are written

- Have someone else read and comment the manuscript
(supervisor, student colleague, ...)

- Preferably someone being the intended "typical reader"

- Adjust according to suggestions: if they didn't understand
something, the same probably holds for others

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Oral presentation degree project

- Many similarities with writing
- **Main difference**: Impossible to cover everything. Be simple!!
- Who are you talking to? Students! should affect presentation
- Remember: audience is not specialist and have not read the thesis
- Try to catch the listeners interest
- Be very simple in beginning and possibly a bit more technical towards the end
- Consider how much time you have when preparing talk
- Give the talk loud for yourself when preparing – takes longer time
- **Never** talk too long. Shorter is fine
- Some slides towards the end should be possible to skip

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Oral presentation: details

- Don't use complete sentences in slides

- At most one slide per minute

- Try to catch eye contact with people in the audience – not always the same person(s)

- Speak loud!

- Talk only about the important parts of the work

- Only important references at end (if any)

- Most important that listeners understand the problem you are addressing (if they don't they surely will not understand how you solved it!)

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Oral presentation: details

Each slide

- Informative title/heading
- use symbol "·", "-", ... to visualize list
- not too much information on one slide
- leave out details
- should only contain information you talk about
- large enough font

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Oral presentation: details

- Talk about a special case rather than most general situation

- You may have notes on the side for your memory

- Unexperienced speakers are recommended to learn 1-2 sentences at the start by heart

- Don't speak too fast

- Make a slightly longer stop after saying important results

- Avoid repetetive "hang-ups"

After talk: try to get feedback from supervisor/student colleagues
– learning to give talks is a process