A guide for thesis students

Working with Johannes

A short and reasonably honest user guide

Hello. If you are reading this, I am probably supervising your thesis, or we are considering whether that would be a sensible thing to do.

The point of this guide is to explain what working with me is actually like. Supervisors have habits, blind spots, good intentions, and slightly strange ways of doing things. Students normally have to discover all of this by accident. That seems inefficient, so I have written some of it down.

This is not a contract. The university already has regulations, and they are much better at sounding professional than I am. This is more of a practical guide to what you can expect from me, what I expect from you, and which mistakes I would prefer that you avoid, partly because I have already made several of them myself.

This document consist of four parts:

Part 1: Working with me — A short introduction to how it is to work with me, what to expect, and bad habits I have.

Part 2: Supervision — A short introduction on how I view supervision and what to think about regarding it from a students perspective

Part 3: Advice — I have collected some advice I myself wish I was given, learned the hard way, or seen other learn the hard way.

Part 4: Writing — Lastly I have some more general recommendations when writing your thesis.

The very short version

- I have many ideas. They are not all instructions. They are not all good ideas either.
- If I forget to answer, remind me. I am probably distracted, not angry.
- Tell me what kind of supervision helps you. I cannot tailor it if you pretend that everything is fine.
- I care about the research, but it is still your thesis.
- You must understand and stand behind everything you submit.

The main point

Your thesis is your work. My job is to help you make it as good as it can reasonably become. My job is not to turn it into the thesis I would have written, and your job is not to treat every sentence I say as law.

If something in this guide does not work for you, that is a useful thing for us to discuss.

Part I

Working with me

Or: things that are useful to know before interpreting my behaviour

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I am interested in the projects I supervise. I also have a lot of ideas, get distracted, and can move from a small technical detail to a theory about society with surprisingly little warning. These facts are connected.

Everything I say is not law

I generate ideas continuously and often out loud. If I suggest a new analysis, a different theory, or half of another thesis, that does not mean you now have to do it. Write down the good ideas. Ignore the bad ones. Park the ones that belong in a future article. If you are unsure, ask me whether I am giving advice or merely enjoying having an idea.

You are allowed to remind me

I may forget an email. I may remember that I should answer while doing something else and then forget again. This does not mean that I dislike you. Send a reminder. If possible, make it specific: "I need to choose between A and B before Friday" is easier to answer than "Could you look at the thesis?" If you nudge too much, I am a grown adult and can tell you.

I am invested, but I do not own the thesis

I design projects that could become articles because I prefer supervising questions that I actually care about. Usually these are things I would happily investigate myself if somebody added another day to the week. This means I want the work to succeed. It does not mean that you have accidentally agreed to publish an article, or that every interesting extension has to be included before submission.

Why I look at problems from several odd angles

- I am a **physicist**, so I like precision, models, assumptions, and sometimes mathematics. An equation is not an act of aggression.
- I am a **criminologist**, so at some point I will ask what society, institutions, incentives, power, or regulation are doing to the problem.
- I work with **safety management**, so I think in risks, controls, failures, and things that went to hell. The things that went wrong are often much more interesting than the things that worked.
- I am also an **IT architect**. I can talk technical details, but I increasingly want to know how the whole mess fits together: systems, interfaces, data flows, dependencies, and where information disappears.

What I actually research

My research has taken a slightly scenic route through sea-ice physics, electromagnetic measurement, Arctic safety, criminology, and financial crime. The common thread is an interest in how complicated systems behave, how problems become visible in data, and what happens when our models meet the real world. I am now an industry PhD researcher at NTNU, funded through DNB. The PhD looks at how systems for detecting money laundering and terrorist financing should be designed and governed as complete systems. Detection is not just a matter of finding one clever model that can classify a transaction. It also depends on data, people, organisations, controls, incentives, and how the different parts work together. My recent work includes machine learning for financial-crime detection, systemic economic crime in the rental market, case-management systems in criminal investigations, and natural-language processing of police texts.

What I can help with

Research design, methods, quantitative and qualitative analysis, risk, technical architecture, LaTeX, reproducible workflows, figures, and arguments that currently exist only as a vague feeling in your head. I will ask questions and sometimes disagree. You may disagree back. Preferably with reasons.

Part II

Supervision

There is more than one correct way to need help

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My twin brother and I are very similar and still do not necessarily need the same kind of supervision. It would be slightly absurd to assume that every student does.

Some students need weekly meetings, proper deadlines, and help breaking a large project into pieces. Others mostly want somebody to argue with once every few weeks. Both can work. The important thing is that we work out what you need instead of accidentally discovering it in a week before the deadline.

We should agree on the setup

How often should we meet? Do you want intermediate deadlines? How far in advance should you send drafts? What kind of feedback is helpful? When should you remind me? We can change the arrangement later. What works during planning may not work during data collection or the final month.

Meetings are for moving something forward

Bring unfinished questions. We can use a meeting to make a decision, test an argument, untangle a method, reduce the scope, or work out why something has failed. You do not need to perform competence for an hour. A short agenda helps, especially if there are two or three things you definitely need an answer to. In short, it helps being prepared.

You can ask for structure

I can help turn "write a thesis" into smaller tasks, set intermediate deadlines, decide what "finished enough" means, and separate essential work from things that would merely be nice. Needing that structure is fine. Pretending not to need it and then vanishing for three months is less fine.

Scope is always trying to escape

A master's thesis is not improved by containing three incomplete theses. We will probably discover several interesting questions. Most of them can go in a document called "later". If I suggest something that adds two weeks of work, ask what we are removing in return. This is particularly important because I am not naturally good at having fewer ideas.

Tell me what feedback you want

"Could you read this?" is a surprisingly difficult request. Should I look at the argument, method, structure, level of detail, or language? Early drafts usually need structural feedback, not an expensive polishing of paragraphs that will be deleted. A focused question makes it much more likely that my answer will be useful.

The thesis is still your responsibility

I advise, challenge, explain, and occasionally rescue. I do not make every decision or keep track of every task. You should record important choices, raise problems early, and be able to explain why you did what you did. If you disagree with me, say so. If you are stuck, say that too. Neither is a moral failure. It is yours to succeed, and yours to fail.

What I expect from you

I expect you to take ownership of the thesis. This does not mean that you must know everything or solve every problem alone. It means preparing for meetings, keeping track of decisions, doing the work we agree on, and telling me when something is not working. If you cannot meet a deadline, say so before the deadline rather than hoping that time will become negotiable.

Ask questions. Disagree with me when you have reasons. Check your sources, understand your methods, and be able to explain everything you submit. Most importantly, be honest about your progress and your problems. I can help with a project that is struggling. I cannot help much with a project that is secretly on fire while everybody politely pretends that it is fine.

Part III

Advice and lessons learned

Some advice is based on experience. Some is based on having ignored the advice myself.

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I have written two master's theses and have supervised or watched enough projects to see certain problems recur. None of the advice below is revolutionary. That is unfortunately not the same as saying it is easy to follow.

Something will probably fail, and that is fine

Some part of your project will probably fail. This is not me being pessimistic. It is research.

In one of my master's theses, I ran an experiment involving a rather expensive sonar. The experiment turned out to be completely useless, apart from demonstrating that expensive equipment can also fail. I had to reorient a large part of the thesis, which was annoying, but the thesis survived.

There are even academic outlets devoted to learning from failed experiments and methodological problems, such as the *Journal of Trial & Error*. So if you are stuck, an experiment fails, or the project goes thoroughly shitwise, tell me. We can usually salvage something, change the method, reduce the scope, or refocus the question. A failed plan does not automatically mean a failed thesis.

Even if the whole thing goes down the drain, you may still end up like me years later, supervising gullible master's students who have somehow concluded that you know what you are doing.

At some point, the thesis may click

There is often a moment when the literature, method, results, and argument suddenly become one picture in your head. This is wonderful. It may happen rather late. Do not sit around waiting for it. The picture normally appears because you have already spent weeks reading, writing, failing, and thinking.

Keep the scope under control

You will discover more questions than you can answer. Put them in "future work" and move on. A thesis with a clear limitation is a thesis. A thesis that tries to solve crime, society, artificial intelligence, and banking in one semester is a scheduling problem.

Keep a log and back things up

Write down decisions, alternatives, changes, strange results, and where the relevant files live. Separate raw data from processed data. Use version control when it makes sense. Make the analysis reproducible. Future-you is not a reliable archive and will resent present-you for assuming otherwise.

I have regretted not taking enough notes more times than I care to admit. I have also seen master's students, researchers, and full professors curse everything that is holy after discovering that the only copy of their data was gone. Academic rank offers surprisingly little protection against a dead hard drive.

Go to the gym, or at least leave the chair

Exercise. Eat. Sleep. See people who do not want to discuss your method section. The final stretch may consume more of your life than is ideal, but the entire semester should not.

Walks and holidays are also useful. The brain has an irritating habit of solving problems after you stop staring directly at them. There is even a respectable tradition of physicists having important ideas while they were supposed to be taking time off. Erwin Schrödinger made the decisive breakthrough behind wave mechanics during a Christmas holiday in Arosa in 1925. Don Page developed the insight behind the Page curve while house-sitting with his family during Christmas vacation in Pasadena in 1992.

I cannot promise that a walk or a week at a cabin will revolutionise quantum mechanics, but staring at the same paragraph for fourteen hours will not necessarily work either.

Remember what you are trying to prove

You do not have to solve the whole problem. You have to show that you can ask a meaningful question, choose and justify an approach, work systematically, interpret evidence, admit limitations, and explain what you did. Negative results and imperfect data are allowed. Pretending that they are something else is not.

Part IV

Writing the thesis

Where vague ideas are forced to survive contact with complete sentences

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Writing is not something you do after the research. It helps you discover what you have done, what is missing, and whether the argument makes sense outside your own head. Start early, while problems can still be fixed. This section covers writing, sources, and tools that should help you think, not think for you.

Use LaTeX

LaTeX is occasionally a difficult friend, but it handles references, equations, figures, numbering, and structure without requiring you to renumber forty-seven things at three in the morning.

A friend of mine wrote her 130-page master's thesis in Microsoft Word. During the final copy-edit, every figure decided to play musical chairs. The result was grey hair and a delayed submission.

Record sources immediately

Use a reference manager. I recommend JabRef. It works directly with `.bib` files, integrates well with LaTeX, and keeps the reference library as a portable text file that can also be placed under version control.

For the thesis itself, I recommend `biblatex` with Biber rather than traditional BibTeX. It is more flexible and handles modern encodings and sorting considerably better. There is no need to turn bibliography management into a second thesis.

Save the page number and a note about why each source matters. Do not assume that you will remember where a claim came from during the final week. You will remember seeing it somewhere. This is not the same thing.

Use AI responsibly

1. Use it as an assistant, not an author. AI can help you get past writer's block, reformulate a sentence, or test an explanation. You must still own the work. Check every fact and source, understand everything you submit, disclose your use according to the applicable rules, and assume that somebody will eventually barbecue you about it. Do not upload sensitive information to an unapproved tool.

2. Do not use it to cheat. If AI is doing the thinking or writing that you are supposed to demonstrate, you are overusing it. It is probably the quickest route from a writing problem to an academic-misconduct case. If I find fabricated material, plagiarism, prohibited use, or work that you plainly cannot explain, **I will report it**.

Write the method before doing the experiment

The methods section should begin as a plan, not as an archaeological reconstruction. Writing it first forces you to specify what you will do, with which data, and how you will analyse it. Afterwards, update it to describe what actually happened and explain important differences between plan and reality. "We mostly improvised and it seemed fine" is rarely a strong methodology.

Write the introduction early as well

The first version tells you what you think the thesis is about. The final version tells the reader what it became. These will not be identical, and that is normal. LaTeX does not charge by the paragraph, so rewrite it.

The background is not a museum

Include something because the reader needs it, because it establishes what is known, or because you use it later. Theory should help you define, analyse, explain, or interpret something. Finding twelve papers is not, by itself, an argument for including all twelve.

Do not leave everything until the final month

I have done this twice, so the advice is supported by both evidence and hypocrisy. Last-minute work can succeed, but it is miserable and fragile. Start making ugly material early. Ugly material can be improved. The blank page remains annoyingly perfect.

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I want you to succeed, and I take the work seriously. Tell me what you need, challenge ideas that do not make sense, and remind me when I forget. This is your thesis. I am here to help, even if I occasionally create three new problems while solving one.