

Welcome to Your Thesis

I Will Be Your Guide

SECUSO - Security • Usability • Society
Karlsruhe Institute of Technology

Welcome to your thesis! Since you are reading this document, you must be thinking about signing up for a thesis at the SECUSO group or maybe you are already onboard! We congratulate you, it is the right decision! This guide will help you to get an overview of what lies ahead and will get you started on your project. It is filled with the knowledge of those that came before you and those that supervise you. Following it will bring you fun and glory (and also good grades), failing to do so will bring you pain and desperation (and also bad grades). There is much ground to cover, but don't worry: By reading this guide you are heading in the right direction!



WHAT, WHEN, WHERE, WHY AND HOW MANY?

Good, you didn't stop reading after the abstract and even the nonsensical heading of this section didn't stop you. We take that as a good sign! But let it be a first lesson to you: The title of the paragraph gave you no idea regarding the topics which this section is actually covering. That is one of the deadly sins of writing scientific texts and something you should always avoid. But we are getting ahead of ourselves. . .

Before we dig further into the facts, this section will first tell you how to use the document and then give you an outline of its contents. So, let's start with the usage instructions. This document is a collection of resources that will help you get acquainted with subjects that are important for your thesis project. Reading this document will not make you an expert in writing theses, but it will make you an expert in knowing where to find the resources to achieve that goal. Instead of copying what others (probably even experts at that) have written elsewhere, we will point you in the right directions. All information in this guide is relevant for master and bachelor theses if not stated otherwise.

The remainder of this document is split up into several sections. First we will introduce our group. Then there follow eight sections, each of which covers one aspect of successfully finishing your thesis project. Many of those sections will comprise one or more *Methods & Skills* parts that contain references to further resources and tools. Last but not least we finish up with some final remarks.

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*Otherwise we assume that you participate in our seminar. In this case we pointed (☞) on sections and subsections of your foremost interest.

I. FIRST THINGS FIRST - WHO WE ARE

Let me first introduce you to the SECUSO group. Our research interests are human factors in security and privacy. Our goals are to develop security and privacy awareness and education approaches as well as usable security and privacy preserving mechanisms. To achieve these research goals the research group is very interdisciplinary, i.e. the team contains or contained people with backgrounds in computer science, math, psychology, social science, and communication science. In all our research, we apply a human centered security and privacy by design approach, i.e. identifying the user's mental models and capabilities, iteratively develop and evaluate the corresponding approaches and mechanisms.

Our research results in publications, software, guidelines, as well as awareness and education concepts¹. The most recent results are:

- PassSec+: software to support users in protecting their data with Firefox [39]
- NoPhish: phishing awareness and education concept including Android app [38]
- TORPEDO: add-on for the thunderbird email client, to help users to detect phishing links in emails [56]
- EasyVote: concept and prototype as online service for complex elections [37]

If you want to learn more about our research group and the research we do, feel free to have a look at our current courses, seminars and practical courses [41]. Please be aware that everything that is programmed while you are part of our research group especially the privacy friendly add-ons will be Open Source.

II. TALKING CONCEPTUAL - THE ANATOMY OF A THESIS PROJECT

Generally speaking, there are six major tasks involved when writing a thesis in the SECUSO group:

1. Choosing or proposing a topic and applying for the thesis.
2. Initial meeting with with your supervisor.
3. Preparing an exposé and presenting it in our Oberseminar Security, Usability and Society.
4. Register the thesis at the AIFB.
5. Completing the actual workload of your thesis and writing everything up.
6. Handing in the written thesis.
7. Presenting your results in the Oberseminar 'Security, Usability and Society'.

¹ A complete list of research results can be found at <https://secuso.aifb.kit.edu/90.php>

Of course, in the end, all theses slightly differ from each other. The major tasks will, depending on your topic and the type of thesis (e.g. user study vs programming vs theoretical), involve a multitude of smaller and possibly very diverse subtasks. The general procedure, however, always remains the same.

Note that you will have to give **two** presentations. One at the **beginning** of your thesis and one at the end. The first presentation is to be given roughly one month after having started working on the thesis. It discusses the outline of the thesis, the steps involved and a preliminary schedule. In the second and official, i.e. **final**, presentation, the completed work is defended.

In the following sections, we give further information regarding each of the tasks, but first we will talk about general time and task management.

For the second presentation you decide whether you want it to be with an audience (probably people from other research groups or guests that are interested in your topic) or if you want to only have the SECUSO research group be part of the presentation. Note that the researcher from our research group are allowed to ask questions. Please discuss with your supervisor beforehand which type of presentation you would like to have.

Also, note that while this document and most of our website are in English, you are free to choose the language you write your thesis in. At least if your choice is either German or English. Same goes for both presentations. But you have to choose one of the languages. Don't mix them in your presentation or in your written thesis.

III. GETTING STARTED - FINDING THE THESIS OF YOUR DREAMS AND APPLYING FOR IT

There are basically two ways to get your thesis topic: (1) you are interested in our general research area, but you have no idea which specific subject you want to work on, or (2) you already have an idea that you would like to turn into a thesis. In the following we will explain on how to proceed in both cases, since it is actually quite similar.

If you are not sure about the exact topic you want to work on, don't worry, we probably have something in store for you! The first step in applying for a thesis in this case is to go to our list of on-going [43] and finished [42] theses and find topics that are of interest to you. Usually this should be the case (see Fig. 1). Once you have identified the area which interests you, have a look at who of our group usually supervises similar topics. Contact them (see our staff page [45]) by writing an email to them detailing your interest². In this email you should reference as precisely as possible, which theses from our page of finished or on-going theses peeked your interest. Also have a look at our results page [40] and check whether there are results corresponding to your area of interest. Precision to describe what of the work done in our research group interests you is key to get a good topic.

² Not too long, please.



Fig. 1. The usual reaction of students upon visiting our theses pages and reading through the topics.

If you already have an idea that you would like to work on, you are welcome to propose own topics, as long as they align with our general domain of research. Again, finding a suitable supervisor is a crucial step. To find the right person to talk to, see the list of on-going [43] and finished [42] theses. Then, just write them an email detailing your idea³. Please beware that all your communications for the thesis need to be secured via KIT S/MIME certificate. For this purpose, you need to obtain a KIT email address which includes your name (Please don't use the wxyz@student.kit.edu) and request a S/MIME certificate for it. It may take about a month to get your new email address with your name and S/MIME certificate, so you can use the existing KIT email address for the first month. For further information please contact SCC.

Be aware that most of our research touches interdisciplinary topics. As such you might be required to e.g. make yourself acquainted with the methodologies involved in conducting a user study if you lack the respective background knowledge.

Once you are sure about the subject which you would like to work on, the first step in applying for it will be to have a meeting with the member of our group who would supervise you (i.e. either the person who posted the open thesis on our website or the person you contacted with your own idea). In this meeting the topic in question for your thesis will be discussed in more detail. The goal here is mainly to get to know each other and clarify the tasks involved in the subject. If a mutual agreement regarding you starting to work on this subject is reached—i.e. you still want to work on the subject after knowing all the juicy details, and the supervisor believes you are the right candidate—you will be given additional information and material to start the actual work.

Note that only after you successfully achieved the first milestone as outlined in the next section (your expose is accepted by the supervisor and you have presented it in our Oberseminar Security, Usability and Society), you will be officially assigned the thesis topic. Having your expose

³ Again: Not too long, please.

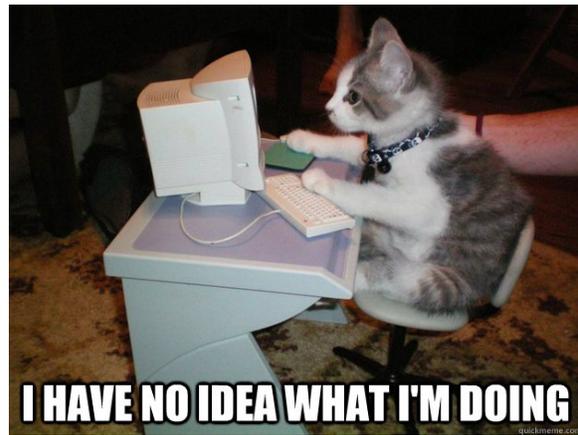


Fig. 2. That might be you when not reading the *Methods & Skills* sections of this guide.

accepted is a hard gate! At this point we will ask you to put your name on SECUSO thesis section in our webpage.

IV. THE FIRST MILESTONE - PREPARING AND PRESENTING AN EXPOSÉ FOR YOUR THESIS

The first step in writing your actual thesis will be to get an overview of the problem domain. You will need to read scientific papers and make a plan on how to proceed. You can make this process a lot easier for yourself if you read through the *Methods & Skills* sections of this guide and consult the respective references before actually getting started (see Fig. 2).

A. What is an exposé?

You will need to prepare an exposé of no more than three pages. This exposé will help you structure your work while getting familiar with the topic. It will also be used to create a schedule for your thesis. The structure purported in it is not set in stone but should ideally not change much in the course of your thesis. You will have to present it in our Oberseminar Security, Usability and Society.

For advice on the presentation, see the section on giving your final presentation. Following this presentation, your thesis will also be officially registered with the examination office [22]. In detail, the exposé needs to cover the following aspects:

A.1. Problem domain: This aspect comprises the identification of the problem domain. Describe it and identify the role of your thesis's topic in it. The focus should lie on answering the following questions:

1. What problem domain does your topic belong to?
2. Why is the topic of your thesis relevant?
3. What is the goal of your thesis? (remember section VIII.A)

A.2. State of the art: Exploring the state of the art⁴ serves the purpose of familiarizing yourself with the problem domain in detail. Once you are through that phase, you will have a good grasp of the status quo. Only seldom, a thesis will use completely new approaches. Instead it will mostly be based on prior work by other researchers. You should be able to differentiate your topic from such prior work and other similar work that has already been done. The focus should lie on answering the questions:

1. Has the topic been the subject of research before?
2. What are approach and stance taken in scientific literature regarding the topic?
3. How will your approach differ from the existing work?

A.3. Problem definition: By now you should have explored the problem domain and the state of the art. Your next step is to define your own research questions and working hypotheses. Depending on whether your thesis is more theoretical or empirical in nature, you might need to formulate different hypotheses. When in doubt your supervisor can tell you what exactly is necessary. Try to answer the following questions as precisely as possible (only those that apply to you):

1. What research questions regarding the topic are the basis of your thesis?
2. What are your hypotheses and how are they motivated?
3. Is there an expected outcome?

A.4. Methods: From the problem definition, the usage of certain methods (be they formal or empirical) should become apparent. Name them and motivate their usage for your thesis. Try to answer the following questions:

1. What are scientific methods which are most suitable with respect to your problem definition?
2. Are there alternatives? If so, why were those not chosen before?

A.5. Next steps: Answer the following questions:

1. How would you proceed? What is the intended schedule for your thesis? When do you plan to submit it?
2. Where do you see pitfalls? How are you planning on addressing these?



B. Methods & Skills - Finding the right literature and reading it the right way

In today's time and age, when we look for information, we usually employ a web search engine of our least distrust. Unfortunately, that is not that easy when it comes to finding scientific literature. The simple reason is that while websites

contain a plethora of useful information, most of it is not scientific literature you want to base your thesis on. Luckily it is not hard to find more suitable literature once you know where to look at:

- Google Scholar [18]
- Microsoft Academic Search [27]
- KIT bibliothek search [55]

Note that some content (e.g. from the IEEE, the ACM, or the KIT catalogue in general) is only available from the university network. So for your literature research you should always be on campus (either physically or virtually through VPN). If you spend some time looking for suitable literature you will probably find a lot. Therefore your next task will be to sort the available texts into two piles: one with papers that are of value to you and one with those that are not. The former will be your trusty companion for the next few days (or weeks depending on its size), the latter will be for the trash bin (hopefully you didn't already print them all out). Reading and judging the worth of texts is not a complex matter and there is much literature on it. To test your newly acquired skills in literature search you should try to find the following resources.

- *How to Read a Paper* (reading, general) [21]
- *How to Read a Scientific Paper* (with focus on studies) [33]
- *How to read and understand a scientific paper: a guide for non-scientists* (general) [32]
- Common Pitfalls in Writing about Security and Privacy Human Subjects Experiments, and How to Avoid Them [35].

Once you found and consulted all the resources stated above, you will find that they actually contradict each other in some aspects. The problem here is simply that every reader is different and you have to find the optimal⁵ style for you.

The last aspect to reading papers is storing them in a useful manner. For a little project or a thesis that is heavy on the programming side, a simple folder with the papers might be sufficient. If you have a theoretical topic or you are doing a literature review, i.e. a survey, of a certain domain, that is not a viable option. You will get lost before you know it. Luckily, there are tools that can help you manage your personal library:

- Papers [25] (plethora of features, but costs money; OS X/Windows)
- EndNote [53].
- BibDesk [8] (free/open-source; OS X).
- Google Scholar [18] (Browser).

⁴ Note that here you can be rather brief and need not to discuss every article in detail. Just give the big picture.

⁵ Which is probably a mixture of all of them.

V. TAMING THE BEAST - COMPLETING THE ACTUAL WORKLOAD AND WRITING EVERYTHING UP

After the exposé has been presented and accepted by your supervisor, the big part of your thesis starts. You should prepare the registration form for your thesis you can find on the website of the faculty [22]. The exact steps to be taken here will be specific to your thesis. As part of your exposé, a schedule needs to be agreed on. This schedule includes all deadlines and the dates of your talks. All changes to the schedule need to be **agreed** on with your supervisor.

During the main part of your thesis you may or may not have regular meetings with your supervisor. You are required to be present in the SECUSO HiWi room at least once a week and participate in at least two Oberseminar suggested before your own presentation. The HiWi room is located in SECUSO location and you can find the address on our webpage. You can activate your card for accessing our building on WIWI website and you get access instantly. However, for specific rooms, you need to contact your supervisor (that he/she contacts Daniel Sommer) and the process can take a few days till you have access. Please also inform your supervisor when you are sick for more than a week. Beware: It's on you to decide how closely you want to be supervised⁶! If you want more input, then ask for it! Good task management is of the essence at this stage. Otherwise you will end up with lots of loose strings in the end and things will be very stressful. Also be sure to agree with your supervisor on a structure of your thesis **early** on.

One of the key aspects here is to start writing as early as possible⁷. It is unwise to wait to the last day to start writing (all-nighter, ho!). There will be only a finite number of opportunities to get feedback from your supervisor on text you have written. Your thesis does not have to be finished to get the first feedback. At that point it might be too late. Also, giving feedback on your entire thesis will take your supervisor a considerable amount of time. Hand in chapters you feel confident about as soon as possible. The schedule you agreed on with your supervisor has respective opportunities set. Use them to your benefit. Plan ahead and always have something else to work on while they read your text.

When handing in text for feedback to your supervisor, certain rules apply:

- You can hand in individual chapters, but those should not be in an early draft state.
- Specify the type of feedback you are after (e.g. general structure, text style etc.).
- Do not expect to get feedback **immediately**. Your supervisors might be working on something else, maybe even another student's thesis. Plan ahead!
- This one should go without saying, but sometimes does not: Do not ignore the feedback given to you or

the amount and quality of the feedback provided will decrease.

- And last but not least: Your supervisor is not a spellchecker! We assume **you** will correct spelling mistakes for the final version of your thesis (yes, even those we do not explicitly mention in the feedback).

Also, and this holds for all aspects of your thesis (be it the thesis text, your study results, meeting minutes, etc.): **Make backups regularly!** You wouldn't be the first person to have their laptop stolen, hard drive crashed, results accidentally deleted, or laptop falling victim to water spillage⁸. Without backups any one of the aforementioned incidents will be a disaster, believe us: **We've seen it and it ain't pretty! So, seriously: Make backups regularly!** Also, using Dropbox only semi-counts as making backups [11].

A. Methods & Skills - Writing scientific texts that are easy to read and understand



Writing scientific texts differs substantially from writing prose such as stories. You probably have learned the latter in school, the former is rarely taught there. The matter is too complex to describe in its entirety in this guide, but there is a plethora of excellent literature on this subject. The general structure of your thesis should normally be along the lines of:

1. Introduction (introduce the reader to the topic, describe why it is interesting, and present the goal of your thesis).
2. Background (present information necessary to understand your thesis) & related work (what has been done in the field, what are key findings, and how differs it from what you are doing).
3. Methodology (which methods have been used and why).
4. Your contribution (here goes the analysis, description of your algorithm or whatever else you achieved in your thesis).
5. Discussion (discuss your contribution, advantages, disadvantages, limitations, etc.).
6. Conclusion (summarize and conclude).

This is only a very generic outline of what has to be done. To know what exactly to put into these chapters and to structure your text on a lower level, please consult the following references:

- *The Oxford Guide to Effective Writing and Speaking* [46].
- *How to Write Consistently Boring Scientific Literature* [34].
- *The virtues of correct citation* [26].

⁶ Terms and restrictions apply. We expect you to work autonomously.

⁷ We emphasise this heavily.

⁸ Yours truly the author had his laptop die of old age the week before a major deadline. And a dead line it was.

When writing a thesis in our group, there is one important formal restriction: We have a template that adheres to the university's corporate design and you have to use it. Find the files here:

- L^AT_EX template [1]

B. Methods & Skills - L^AT_EX Primer

Last but not least, we should mention some tools to get you started with L^AT_EX, which is the option we recommend⁹ from the two above.

L^AT_EX is a document markup language¹⁰, i.e. it provides a programming language to markup text in a document. Such a document can then be processed by the actual *latex* program. This program¹¹ provides an engine to compute and set the layout of your document.

To be more precise, L^AT_EX defines instructions that are expressed by tags. These tags in turn define the layout of the corresponding section of a document. Under the hood, L^AT_EX provides an engine written in T_EX for converting marked up text in the L^AT_EX format into a completely laid out document¹². L^AT_EX is entirely editor independent and only refers to the encoding, tagging conventions, or (simply speaking) commands that are used.

Getting started with L^AT_EX requires two things: (1) an editor to markup the text and (2) the L^AT_EX compiler. Saying that you need a particular editor in order to access L^AT_EX is like saying you need a certain pencil in order to write on a sheet of paper. Nonetheless we suggest some editors that might help you with getting started. Some of the most useful properties of such editors are auto-complete for markup commands, text highlighting and preview of the resulting PDF document. ShareLatex is an online editor which has the added benefits, that you do not need to install and configure the compiler.

- ShareLaTeX (Browser)/Overleaf [47]
- Texmaker (multi-platform) [52]
- Kile (multi-platform) [20]

If you want to use L^AT_EX locally (which undoubtedly has the benefit of being able to work offline), you will need to install one of the following L^AT_EX distributions:

- MiKTeX (Windows) [29]
- MacTex (OS X) [24]
- TeX Live (Unix/Windows) [51]

In order to get you started with writing L^AT_EX markup and to answer most questions you might encounter while writing your thesis, we suggest the following links:

- Introduction:
lshort – A short introduction to L^AT_EX 2e [54]
- Manual:
Wikibooks [57]
- Question/Answer platform:
Stack Exchange [49]

C. Methods & Skills - A Brief Introduction to User Studies

Since much of the research in our group is focused on human-machine-interaction, it might be sensible (or even necessary) to conduct a user study. The decision to conduct a user study is always made with your supervisor. A serious introduction for those that never heard anything about the subject is well beyond the scope of this guide. However, there are several excellent references on the topic:

- How to Design and Report Experiments [15].
- Discovering Statistics Using R [16].
- Common Pitfalls in Writing about Security and Privacy Human Subjects Experiments, and How to Avoid Them [36].

If you conduct a user survey, there are certain tools you can use. Note that you need to check yourself whether they comply with the new General Data Protection Regulation (GDPR) [13]:

- SoSci Survey [48]
- LimeSurvey [23]

Please note that the results of the study will not affect your grade, but your interpretation will. It is a viable result to state that your proposed solution does not offer improvements over existing solutions. Interpreting the data in a biased way or conducting an analysis in a way that is favourable for your proposal is not!

Also if you conduct user studies, there might be ethical implications. Any issues must be discussed with your supervisor and clearance by the university's ethics commission must be attained. Also, before designing your study you should consider the current data protection laws [12].

Note that there are standard methods to collect usability data from participants. In particular there is the *System Usability Scale* (or SUS for short) [10]. Sometimes you might need a German translation of this questionnaire. If so you can find a translation in appendix A. SECUSO often uses the same questions for sozio-demographic information, if you don't know them, please ask your supervisor for the template. It saves you time to construct them and minimizes trouble afterwards, explaining your own questions and possible answers to them.

If it was decided that your project benefits from a user study, there might be rewards in order of attracting participants. Depending on the amount of money involved in might be necessary that you advance the necessary money

⁹ If you want to keep most of your sanity.

¹⁰ Interesting side-note: L^AT_EX is also Turing-complete. ☺

¹¹ Which is actually a compiler.

¹² All this sounds very complicated, but usually happens unnoticed in the background.

on loan and claim it back from the university afterwards using a form. In any case you always need to get some form of receipt that proves the reception of the reward by the participant. If your study was conducted in a lab this will usually mean that participants have to sign a respective form. If you conducted an online study and the participants cannot pick up their reward at the university you will need to send it via registered mail. In this case we propose to use attention questions that check if the participants carefully reads what he is supposed to do. This helps to minimize the reduction of participants afterwards, because of their focus on maximizing their benefit in speeding through the study. Please ask your supervisor for further assistance on this topic to reduce possible problems later on in the study process.

VI. LAND, HO! - HANDING IN THE WRITTEN THESIS

At some point in time you will realize that you are done. Depending on the current state of your thesis you might have a hard time believing this. Rest assured, however, the day will come when your thesis is finished and you can hand it in (or you tried to pull the all-nighter stunt and are not only done but also done for; see Fig 3).

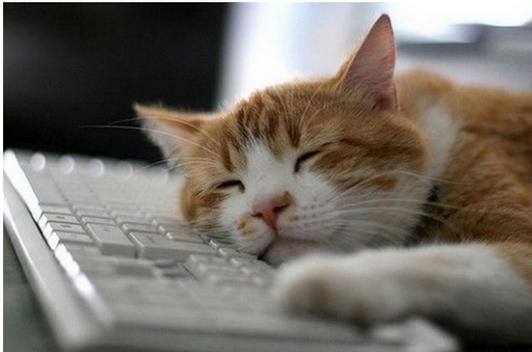


Fig. 3. We strongly advise you to start producing text early. Putting off the writing to the last point in time possible will exhaust you and cause nothing but stress!

Once the time has come, there are only a few things you need to pay attention to:

- You will need to have a printed version for us. At least if you are a student enrolled at the AIFB institute at the time of this writing. To be sure, check the site of your examinations office to get the latest info or simply go there and ask. The printed version of your thesis should include the title on its spine as well.
- You will need to hand in an electronic version of your thesis as well. Prepare some form of data medium (e.g. CD and USB thumb drives are ok, punch cards are not) to go along with each copy of your thesis. That medium does not have to be handed in on the actual deadline. Instead wait until you have your final presentation ready.

Please put the slides of both talks (ppt or pdf), the exposé (pdf or doc), the thesis (pdf or doc) and all the source code which you might have written for your thesis and all the data you might have gathered in user studies together with the analysis on this medium.

- Check the opening hours of the examination office. You might want to plan ahead and have your thesis deadline on a day when it is open. This makes handing in your thesis infinitesimally easier.
- You will need to sign a consent form with us. That can be done at the date of your final presentation or earlier (your supervisor will decide this).
- Whether or not your presentation counts for your final grades need to be discussed with your supervisor.
- Note that you will usually not receive the final grade at the date of your presentation, but receive an email shortly after.
- If you need a confirmation that you completed the thesis before the grade is final (4,0-Bescheinigung), we can only issue the respective documents once you have (a) handed in the thesis with the examination office and (b) have held your presentation of the results in our Oberseminar Security, Usability and Society (i.e. completed the mandatory colloquium). This is mandated by the examination office and none of our doing. So please don't ask us if we can make an exception: We cannot!

Sometimes things go wrong in the last minute (remember the warning about backups!) and you might need to extend the deadline for handing in your thesis. This is generally possible, there exists no specific form to request a deadline extension. Further information can be found at the faculty website [22].

VII. THE FINAL PROVING - PRESENTING YOUR RESULTS IN THE OBERSEMINAR SECURITY, USABILITY AND SOCIETY

The final step in your thesis is to present your results in our Oberseminar Security, Usability and Society. You are well prepared for this. You have already given one presentation in our Oberseminar Security, Usability and Society, you know the matter inside out and your thesis is logically structured and well written¹³ and therefore you can easily create a presentation that is fun and interesting¹⁴. Please see below for the official SECUSO slide template. In there will you will find additional instruction on how to prepare your talk. The image in the first page of the template and the footnotes are there as examples and they need to be modified accordingly. Everyone in the audience is allowed to ask questions after your presentation. This often leads to interesting and others

¹³ Because you followed the advice given in the resources we told you about before.

¹⁴ The *Methods & Skills* part of this section has a lot of valuable resources on how to achieve this.

might enhance the discussion with insight from other areas. Per default the talk is going to be with an external audience if you miss to communicate something different. Keep in mind that having an external audience at the Oberseminar helps make others aware of what you do and might be useful for future theses or projects.

When presenting at our Oberseminar Security, Usability and Society there are a few points to be aware of:

- Set a date well in advance. Ask your supervisor to arrange for it and put the date in your calendar.
- Prepare your presentation with the available time in mind. The allotted time for the presentations is (1) 15 minutes for the exposé talks (here you need to talk less, but should be prepared to ask the questions you need to ask and gather as much feedback as possible), (2) 20 minutes for Bachelor final talks, and (3) 20 - 30 minutes for Master final talks. If you believe that you have too much to say to fit it into the available time, consider selecting only a few topics for the talk. As always: when in doubt ask your supervisor. After your talk the discussion might continue.
- The talks of our Oberseminar Security, Usability and Society are announced via various channels, most notably in our newsletter. Therefore, title and abstract need to be available before your talk, to be precise at least two days before the first day of the month in which you give your talk (e.g. if your talk is on February 23rd, title and abstract are due January 30th).
- Be there at least fifteen minutes early to set up your laptop (bring all necessary cables and adapters minus the VGA cable—which we supply). You might need to wipe the white board or prepare a demo involving the code you’ve written. Again, the key thing to remember is: Plan ahead!
- There will be a discussion following your talk. Don’t be afraid! The goal here is not to humiliate or embarrass you. Instead you should regard all questions as a good sign, because your talk was interesting enough that people actually care about your work and followed it. Also, it is okay to acknowledge a limitation of your work. If you are aware of it and you can justify your decisions, it won’t be held against you¹⁵.
- People will have their laptops open and type during your presentation. Don’t be irritated by this. Everybody is listening and just taking notes to ask you questions afterwards and provide further comments to you after the talk.
- After giving your talk, we ask everyone to fill out a small form. We would be happy if you give us the right to use the material/code developed, the presentations and thesis to use them for future research and save them in our data storage. If your supervisor forgets the form, feel free to ask for it and remind her/him.

¹⁵ Remember the part about the meeting minutes! However, obvious terms and restrictions apply.

A. Methods & Skills - Giving a good talk



Writing a thesis in the SECUSO group requires you to give **two** talks, one in the beginning and one at the end. They will probably be neither your first talks you give nor will they be your last. Giving good talks is a skill that comes handy in many situations. No matter whether you end up in industry or academia, you will be required to present in meetings or on conferences. Therefore spending time on acquiring that skill is never wasted time. Again, we will give the floor to experts that are far more knowledgeable than we ourselves (the first link is our PowerPoint template with curated instructions):

- *SECUSO PowerPoint Template* [44]
- *The Oxford Guide to Effective Writing and Speaking* [46]

You need to attend at least twice at our Oberseminars. Please subscribe to our mailing list using the following link. This will help you to be up to date and informed for all the talks at our Oberseminar.

<https://www.lists.kit.edu/sympa/subscribe/secuso-thesis>

VIII. STAYING ORGANIZED - A BRIEF THESIS MANAGEMENT PRIMER



Planing and managing the workload involved in writing your thesis and keeping ahead of things is of the essence to successfully complete the project. There are many aspects to this and we will support you, but some aspects are solely on you (it is your thesis after all).

A. SMART

A crucial part of writing your thesis is developing a plan. The most important aspect of this plan will be setting objectives or goals to guide you from one step to another. Sometimes these will be set by your supervisor, sometimes they will be set by you. No matter who set them, you should only ever accept an objective or a goal if it is SMART [9]. SMART is an acronym and stands for five criteria:

- S** Specific
- M** Measurable
- A** Achievable
- R** Relevant
- T** Timed

All five criteria¹⁶ should be applicable to any goal you set. Specific means that the goal’s scope should be precisely formulated. Measurable means that you need to be able to measure the progress of the goal and when you have reached the goal. Achievable means that the goal must be realistically achievable given your resources and skills. Relevant means

¹⁶ If you followed the reference or simply search for SMART on the Internet, you will realize that the exact terms the acronym stands for differ between sources. We simply believe the above selection to be the most sensible choice.

that the scope of the goal must be clearly relevant for the scope of the overall task. Timed means that you should always set a deadline for the goal and how much time you allocate for achieving the goal.

Having a plan of many achievable goals (e.g. formulate hypotheses, write up related work, etc.) will help you tremendously to keep track of what you have achieved and what must still be done.

B. Meetings

Before we start talking about the actual meetings with your supervisor we want to provide some important information. Probably you will have a first meeting with the Prof. Volkamer or some other worker in the research group. You need to know that we are happy if someone thinks about writing a thesis in our group and we are willing to meet with you. Still there are other tasks we have to work on and therefore we are not able to hold slot we proposed for a meeting more than 24h. Generally if you contact us and want to work with us, you should check your e-mails at least once a day and therefore respond to a proposed meeting date. You don't have to agree on the date, but at least an answer and/or an alternative date helps to move on constructively. After this initial meeting we will hold the topic discussed for a week. If there is no sign from you until then we expect you don't want to proceed further and will open the topic again for some other person.

You will have regular meetings with your supervisor on average every two weeks. Prepare these meetings carefully. That way you will benefit the most from them. Your supervisor will instruct you in more detail on how s/he handles things, but several points hold generally for all meetings:

- Send the list of topics you want to discuss to your supervisor well **before** the meeting. This is especially important with questions or requests you have (e.g. setting up a virtual machine for a study etc.). While you are fully aware of all aspects of your thesis (or at least you should be), your supervisor may not, depending on the time that has passed since the last meeting.
- Be punctual. There might be other meetings scheduled after yours and other students might have important points to discuss with their supervisor as well.
- Take notes during the meeting. In particular, all decisions and the respective arguments should be documented. This helps you to justify them when writing your thesis. Structure these notes and **send** them to your supervisor latest in two days after the meeting. This helps to identify aspects for which your understanding differs from the understanding of your supervisor. This is really important as sometimes you have the feeling that you both were on the same page, but actually you both had a different understanding of the decisions made. Writing it down will help you to really bring all the stuff on point and sending it will save time for both as changing things later always takes more time than earlier.

The GROW approach¹⁷ is a technique that supports you/your supervisor to structure regular meetings in a way to get most benefit for both of you; you might say that GROW is a guideline to provide help to self-help. The approach captures four phases of regular meeting, namely to establish the goal(s), to explore the current situation, to identify and review options for progress, and to agree on a way forward.

In case meetings are not practical, regular reports to your supervisor (e.g. every week) are a viable alternative. In such reports you should always state the current progress you made in relation to the tasks discussed with your supervisor. You don't have to only report finished tasks in such a report. Sometimes tasks take more than a week to finish. Still it is possible to give a progress evaluation of a tasks. This also gives you the possibility to ask questions more easily if you have problems with your progress. Please send your questions and topics at least two days before your meeting.

C. Tools

The following tools (given in no particular order) can help you to plan and manage tasks and time expenditure during your thesis:

1. Organizing ToDos

- Trello [6] (Browser)
- Google Docs [17] (Browser)

2. Calendar

- Thunderbird + Lightning [30] (Multi-platform)
- OneCalendar [7] (Windows)
- Calendar [5] (OS X)
- Google Calendar [17] (Browser)

3. Note taking & management

- Tomboy [5] (Multi-platform)
- OneNote [28] (Multi-platform/Browser)
- Evernote [14] (Multi-platform/Browser)
- Google Docs [17] (Browser)

4. Productivity

- Pomodairo [31] (Multi-platform)
- HabitRPG [19] (Browser)
- Self Control [50] (OS X)

¹⁷ Information about GROW is broadly available online, see for instance http://www.mindtools.com/pages/article/newLDR_89.htm.

IX. AFTER ALL IS SAID AND DONE

After you handed in your thesis, gave the second talk and mastered all the strange questions from the audience, you are officially done! Congratulations! The only thing you have to do now is relaxing and enjoying your free time (see Fig. 4). You will be notified once the grade is set.



Fig. 4. Having finished your thesis you earned yourself some time off! (That is assuming there are no lectures or exams left for you. In that case: Back to work!)

X. FINAL REMARKS

Having read through this guide, you took the first step in mastering your thesis project. Take the time you need to acquire the necessary reading and writing skills. Without them you will read papers that are of no value to you (wasting time in the process) and probably have to re-write parts of your thesis (wasting even more time in the process). The time you invest here before beginning the actual writing process is well spent and saves you a lot of work¹⁸! The goal of any thesis written in our group is to foster the scientific process and make you as a student part of it. Therefore, a thesis in our group can be a great opportunity, as long as your goal is to create a thesis that can be rightfully called *scientific* work.

Furthermore there are several links that are important for conducting a thesis at AIFB. Therefore we recommend to look at these links to, as we did not provide status quo formal guidelines for a thesis:

- Thesis Registration [4]
- Guide for the preparation of a scientific thesis at AIFB [2]
- Tex-Template for a Thesis [3]

Master students can also have their thesis credited for the KASTEL certificate. You can find more information on how to get qualified for the certificate on our website (https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

¹⁸ And you might have guessed it already: therefore a lot of time, too.

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We would like to thank all the authors and developers of the referenced articles, books and software. They have saved us an incredible amount of time by offering their wisdom and tools to the world. Furthermore we would like to thank all the people who have contributed to this document through comments, suggestions, references, writing passages or otherwise. Also, we would like to encourage anyone to send us feedback to this guide. As stated at the beginning this guide can only become better if people contribute to it! Last but not least, here's a big thanks to all the people on the Internet sharing all varieties of funny cat pictures.

A. GERMAN TRANSLATION OF THE SYSTEM USABILITY SCALE (SUS)

1. Ich denke, dass ich das System gerne häufig benutzen würde.
2. Ich fand das System unnötig komplex.
3. Ich fand das System einfach zu benutzen.
4. Ich glaube, ich würde die Hilfe einer technisch versierten Person benötigen, um das System benutzen zu können.
5. Ich fand, die verschiedenen Funktionen in diesem System waren gut integriert.
6. Ich denke, das System enthielt zu viele Inkonsistenzen.
7. Ich kann mir vorstellen, dass die meisten Menschen den Umgang mit diesem System sehr schnell lernen.
8. Ich fand das System sehr umständlich zu nutzen.
9. Ich fühlte mich bei der Benutzung des Systems sehr sicher.
10. Ich musste eine Menge lernen, bevor ich anfangen konnte das System zu verwenden.

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Einverständniserklärung

Hiermit erkläre ich,, geboren am, in, im Zuge der Bearbeitung meiner Abschlussarbeit mit dem Titel

an den folgenden zwei Vorträgen des Research Seminars als Zuhörer anwesend gewesen zu sein:

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