

Thesis Instructions

**Department of Computer
and Systems Sciences**

Thesis Instructions
for Bachelor's and Master's
Paul Johannesson and Jakob Tholander
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**Stockholm
University**

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1 Learning Objectives

1.1 Learning Objectives for Bachelor's

After completing the course, a student is expected to be able to:

- independently carry out an academic work
- select and apply relevant scientific methods
- reflect on ethical aspects of research and development work
- search for, find, and summarize relevant scientific literature
- analyze and critique relevant scientific literature
- critically reflect on their work, especially regarding ethical and societal aspects
- discuss the need for knowledge development based on their own work
- write and defend a report with sound argumentation and appropriate and professional language use
- apply correct ways to reference and cite relevant scientific texts
- prepare and conduct a short oral presentation of their own work
- write a short written account of their own work

1.2 Learning Objectives for Master's (One-Year)

Same as for Bachelor's

1.3 Learning Objectives for Master's (Two-Year)

After completing the course, a student is expected to be able to:

- independently carry out a qualified academic work
- contribute to knowledge development within computer and systems sciences

- select and correctly apply relevant scientific methods
- reflect on ethical aspects of research and development work
- search for, find, summarize, and build upon relevant scientific literature
- analyze and critique relevant scientific literature
- critically reflect on their work, especially regarding ethical and societal aspects
- discuss the need for knowledge development based on their own work
- write and defend a report with sound argumentation and appropriate and professional language
- apply correct ways to reference and cite relevant scientific texts
- prepare and conduct a short oral presentation of their own work
- write a short written account of their own work

2 Grading Criteria

The grade for a thesis is determined as follows. Each criterion below is first assessed with a value (possible values are indicated under the heading for each criterion). The grade is calculated according to the grade boundaries in the next chapter. The minimum requirement for passing a criterion is indicated in bold.

U1 Abstract

Bachelor: 0/**1**, Master's (1 Year): 0/**1**, Master's (2 Years): 0/**1**

For 1 point, the abstract must accurately reflect the thesis content by describing the problem, research question, method selection, method application, results, and conclusions, and it should be understandable on its own, separate from the thesis.

The abstract should be concise but detailed enough that a reader can determine if the thesis is of interest after reading it. It must not contain references to sections in the thesis, citations, or unfamiliar abbreviations.

U2 Introduction

Bachelor: 0/**1**, Master's (1 Year): 0/**1**, Master's (2 Years): 0/**1**

For 1 point, the thesis must provide an introduction to the subject and problem of the thesis.

The introduction should be thorough enough for a reader to gain sufficient understanding of the thesis problem and research question.

U3 Problem

Bachelor: 0/**1**, Master's (1 Year): 0/**1**, Master's (2 Years): 0/**1**

For 1 point, there must be a problem of general interest that can be wholly or partially solved by answering the research question.

The problem should be described in a way that makes it easy for the reader to understand. The reader should not have to search for the problem or guess what it might be. Including a sentence like “The problem underlying this thesis is ...” is often appropriate. The problem should be justified based on what was discussed in the introduction. There should be only one, or a small number of related, problems. It should be clear how the problem relates to the field of computer and systems sciences.

U4 Research Question

Bachelor: 0/1/2, Master’s (1 Year): 0/1/2, Master’s (2 Years): 0/1/2

For 1 point, a clearly formulated and well-defined research question of general interest is required. The student must independently identify and formulate the research question. The research question should be justified based on the problem so that it is clear how the answer addresses part or all of the problem. For 2 points, an innovative research question that enables the work to make a significant contribution is also required.

There should generally be one, and only one, clearly formulated and well-defined research question. In some cases, it may be appropriate to introduce a small number of closely related research questions. There should be an argument for the relevance of the research question. It should be easy for the reader to find the research question. Including a sentence like “The research question in this thesis is ...” is often appropriate. The research question should be answered later in the thesis.

U5 Scientific Grounding

Bachelor: 0/1/2, Master’s (1 Year): 0/1/2, Master’s (2 Years): 0/1/2/3

For 1 point, the thesis must provide subject matter grounding based on previous scientific work. The thesis should clearly indicate which specific area of computer and systems sciences it contributes to by referencing the relevant scientific research. For 2 points, an in-depth and critical discussion of how the work builds on previous scientific work is also required. For 3 points, an extensive literature review that underpins the positioning and evaluation of the thesis’s contribution to knowledge in a scientific context is also required.

There should be an introduction to the research area to which the thesis belongs. The most central concepts of the thesis, especially those mentioned in the research question, should be explained and discussed based on previous research. There should be a discussion of previous solutions

to the problem that the thesis addresses. There should also be a discussion of the scientific works on which the thesis is based, with a justification for why these were chosen. Relevant theories for the problem and research question should be discussed, but for a bachelor's thesis, it is not necessary for it to be based on such theories.

U6 Method Choice

Bachelor: 0/1/2, Master's (1 Year): 0/1/2, Master's (2 Years): 0/1/2/3

For 1 point, the selection of research strategies and research methods must be clearly described and justified based on the research question. At least one alternative research strategy and method that could be used to address the research question should be discussed, and relevant ethical considerations should be addressed. For 2 points, a thorough discussion of applicable alternative research strategies and methods and a detailed argument for the choices made are required. For 3 points, a discussion of the method choice in relation to research strategies and methods applied in related current scientific studies considered state-of-the-art is also required.

It should be clear how the thesis relates to empirical research and design research. If the thesis relates to design research, a methodological framework for design research should be discussed, for example, [3]. Both research strategies, data collection methods, and data analysis methods should be described. For example, see [1] for the difference between these. The description should include references to methodological literature. Ethical aspects should also include references to literature, such as Appendix 1 in [1]. The discussion should be closely tied to the thesis' research question. There should not be long, general descriptions of research strategies and methods that are merely accounts from the literature without connection to the thesis. Often, it is sufficient to discuss only one alternative research strategy and method.

U7 Method Application

Bachelor: 0/1/2, Master's (1 Year): 0/1/2, Master's (2 Years): 0/1/2/3

For 1 point, the application of selected research strategies and methods must be clearly described, the use of software tools should be described, and relevant ethical aspects should be discussed. The description of software tools should include a discussion of specific tools for data collection,

analysis, and AI-based text and content generation. For 2 points, the application of research strategies and methods should be conducted in accordance with their requirements, with a clear argument for this. For 3 points, there should be significant depth in the data analysis.

It should be clearly described how the selected research strategy and methods (both data collection and data analysis methods) have been applied. If the thesis relates to design research, it should explain how the chosen design research framework has been applied. The description should include references to methodological literature. Ethical aspects should also include references to literature, such as Appendix 1 in [1]. For data analysis, relevant software tools should be used. For descriptive statistics, a spreadsheet tool may suffice; for inferential statistics, more advanced statistical tools may be needed (e.g., SPSS); for content analysis, a qualitative data analysis tool may be used (e.g., Atlas.ti or Dedoose), and tools like Chat-GPT.

U8 Results

Bachelor: 0/1/2, Master's (1 Year): 0/1/2/3, Master's (2 Yearss): 0/1/2/3

For 1 point, the results should be of sufficient scope and quality and be presented in such a way that the research question can be partially answered. For 2 points, the results should be of sufficient scope and high quality so that the research question can be largely answered. For 3 points, the results should be well described, of significant scope, and high quality so that well-supported conclusions relevant to the research question can be drawn.

Collected data should be analyzed and interpreted using an appropriate data analysis method. The presentation of the results should be clear and logical. The types of charts and/or tables used should be appropriate, clear, and relevant to the type of data collected and analyzed. If an artifact is part of the result, it should be carefully described, preferably with both text and figures.

U9 Conclusions and Discussion

Bachelor: 0/1/2, Master's (1 Year): 0/1/2/3, Master's (2 Years): 0/1/2/3

For 1 point, the research question should be clearly answered, limitations in the study design and their impact on the conclusions should be

discussed, as well as how the results relate to previous studies, possible future studies based on the current study should be discussed, ethical and societal implications of the study's conclusions should be discussed, and the use of IT tools (including AI tools) for the thesis work should be described and discussed. For 2 points, the study's limitations should be discussed in depth, and a detailed discussion of possible and relevant future studies should be provided. For 3 points, an in-depth discussion of the study's originality and relation to previous studies is also required.

The discussion should be closely tied to the research question and the scientific grounding. Based on the results, a clear answer to the research question should be provided. This should be formulated and placed so that it is easy for the reader to find the answer. Limitations should be discussed in terms of reproducibility, validity, reliability, generalizability, transferability, credibility, etc., depending on the method choice and method application. For some theses, there may be hardly any ethical or societal implications. In such cases, the discussion can be brief, but it should explain why the authors believe there are no major ethical or societal implications.

U10 Form, Structure, and Language

Bachelor: 0/1/2, Master's (1 Year): 0/1/2, Master's (2 Years): 0/1/2

For 1 point, the thesis must be divided into clear and cohesive sections, meet basic layout requirements, and the text should be written in appropriate and professional language. For 2 points, the thesis must also meet high layout standards, and the text should be written in appropriate, professional, and academic language.

Headings, subheadings, typography, and other structural elements should be used so that it is easy for the reader to follow the thesis's argumentation. Examples of layout requirements include that all figures are numbered and have a caption, chapter 1 starts on page 1, and the reference list is not numbered as chapter. The thesis should consider the layout requirements found in section 7 of [2]. A thesis must not contain language errors. Colloquial language should be avoided. Incorrect word choices should not occur; for example, one should not write "there" when meaning "their." One should also not mix languages in a thesis, for example, using phrases like "course recommender system" in a Swedish-language thesis. The thesis should adhere to the language guidelines in section 6 of [2].

U11 Argumentation

Bachelor: 0/1/2, Master's (1 Year): 0/1/2, Master's (2 Years): 0/1/2

For 1 point, the argumentation should generally be well-founded, logically coherent, concise, clear, and understandable. For 2 points, the argumentation should be highly well-founded, logically coherent, concise, clear, and understandable.

Central concepts should be defined, discussed, and exemplified. New terms should be explained the first time they are used unless they are widely accepted. Personal opinions and assessments should be distinguishable from statements based on other sources. When making a statement, evidence should be provided, usually through reasoning or a reference to literature. A bachelor's thesis may contain up to 8,000 words, while a one-year or two-year master's thesis may contain up to 10,000 words (excluding title, abstract, table of contents, references, and appendices); deviations from this rule are allowed only with the supervisor's approval.

U12 References and Documentation

Bachelor: 0/1, Master's (1 Year): 0/1, Master's (2 Years): 0/1

For 1 point, previous work must be correctly referenced according to an accepted referencing system, a clear list of sources used should be provided according to the same system, all quotes from previous work should be clearly cited, and relevant appendices should be included.

All references in the reference list must be found in the text and vice versa. The reference list should be structured uniformly and consistently according to an accepted referencing system, such as the Harvard system. See section 5 of [2]. The thesis should contain at least ten scientific references (typically an article in a scientific journal or conference) at the bachelor's and one-year master's levels and at least twenty scientific references at the two-year master's level.

U13 Originality and Significance

Bachelor: 0/1/2/3, Master's (1 Year): 0/1/2/3, Master's (2 Years): 0/1/2/3/4

For 1 point, the thesis must provide new contributions to knowledge, in the form of new ideas, artifacts, or products. For 2 points, the thesis must also contain research contributions with the potential to advance the current research area. For 3 points, the thesis must also include high-quality results with the potential to contribute to the state-of-the-art within the

current research area or to form the basis for usable solutions, such as in the development of commercializable products. For 4 points, the research contributions must be of such quality that they contribute to scientific knowledge within the current research area and could be published in a peer-reviewed journal or conference of good scientific quality.

Ö1 Opposition Report

Bachelor: 0/1/2, Master's (1 Year): 0/1/2, Master's (2 Years): 0/1/2

For 1 point, the opposition report must provide a short summary of the evaluated work, discuss the thesis's scientific grounding, originality, significance, formulation of problem and research question, method choice, and method application, and contain clear suggestions for improvement. The opposition report must include both editing and proofreading of the thesis. For 2 points, the opposition report must provide a thorough and balanced evaluation of the strengths and weaknesses of the work from various perspectives, along with clear and well-reasoned suggestions for improvement.

Ö2 Presentations

Bachelor: 0/1, Master's (1 Year): 0/1, Master's (2 Years): 0/1

For 1 point, oral presentations of sufficient quality must have been given at designated times, and the ability to orally defend one's work must have been demonstrated.

Ö3 Participation in Seminars and Meetings

Bachelor: 0/1, Master's (1 Year): 0/1, Master's (2 Years): 0/1

For 1 point, the ability to orally discuss and provide constructive criticism of others' work must have been demonstrated at seminars and meetings.

Ö4 Deadlines

Bachelor: 0/1, Master's (1 Year): 0/1, Master's (2 Years): 0/1

For 1 point, the ability to prepare and deliver materials and presentations on time at all required occasions must have been demonstrated.

Ö5 Revision after Final Seminar

Bachelor: **0/1/2**, Master's (1 Year): **0/1/2**, Master's (2 Years): **0/1/2**

For 1 point, only minor revisions of the thesis should be required after the final seminar. For 2 points, almost no revisions should be required after the final seminar.

Ö6 Reflection

Bachelor: **0/1**, Master's (1 Year): **0/1**, Master's (2 Years): **0/1**

For 1 point, the ability to reflect on the completed thesis work must have been demonstrated through the individual writing of a reflection document.

3 Grading

3.1 Requirements for Passing

A student must complete all of the following activities to pass the thesis course:

- Write and defend a bachelor's or master's thesis that meets the grading criteria.
- Write two peer reviews of other students' works — this must be done individually.
- Submit two versions of their text for peer review in Peer Portal in SciPro Projects to be reviewed by other students.
- Actively participate in the final seminar — one for bachelor's students, two for two-year master's and one-year master's students—this must be done individually.
- Oppose a thesis (bachelor's, one-year master's, or two-year master's)
a) through oral opposition at a final seminar, b) in writing, in the form of an opposition report — this must be done individually.
- Submit a revised version of the thesis after the final seminar.

3.2 Grade Boundaries

To pass, each grading criterion must be assessed as passed (in bold in the possible values for the criteria).

Grade Boundaries for Bachelor's

31 – 29: A

28 – 26: B

25 – 22: C

21 – 19: D

18 – 16: E

Grade Boundaries for One-Year Master's

33 – 31: A

30 – 28: B

27 – 24: C

23 – 21: D

20 – 19: E

Grade Boundaries for Two-Year Master's

37 – 35: A

34 – 32: B

31 – 28: C

27 – 25: D

25 – 23: E

4 The Thesis Process

4.1 Roles

In a thesis project, students and teachers participate in several roles: author, supervisor, reviewer, and examiner. Below are the tasks and responsibilities for these roles.

AUTHOR is a student writing a thesis. The author is responsible for ensuring that the thesis progresses according to the planned schedule.

SUPERVISOR is a teacher who supervises an author in a thesis project. The supervisor's responsibility is to ensure the quality of the work performed by the author. This is primarily done by providing the author with advice and guidance. Additionally, the supervisor must review and quality-assure the draft sent to the reviewer in Phase 2 (see below), the draft of the thesis sent to the final seminar in Phase 4, and the completed thesis sent to the examiner in Phase 5. A student has the right to submit their thesis to the examiner even if the supervisor does not approve it. In such a case, the student forfeits any further supervision and assistance if the examiner fails the thesis. It is recommended not to do this, as there is a risk that the student may miss important aspects and consequently have their work rejected.

REVIEWER is a teacher who provides advice to the supervisor and author. The reviewer's responsibility in Phase 2 is to read a draft and provide feedback. If the reviewer identifies significant weaknesses in the draft, they should indicate that revisions are required and initiate a renewed review, *and, if necessary, start a dialogue with the supervisor and possibly also the author*. Both the supervisor and the author should listen to this feedback and be prepared to engage in a dialogue with the reviewer on how to address these issues.

EXAMINER is a teacher who grades a thesis. The examiner's responsibility is to ensure the quality of the completed thesis. The examiner must read and grade the completed thesis submitted in Phase 5. Both the supervisor and the author must follow the examiner's instructions.

4.2 Activities and Phases

The thesis is carried out in five phases, briefly described below. Please note that, in addition to the phases below, the supervisor should continuously provide support for the student. It is up to the supervisor and student to jointly decide the frequency and format of this support. There are fixed dates for submission for Phase 2; current dates can be found on the thesis course's website.

Phase 1 – Preparation

The goal of this phase is to develop a proposal for the thesis topic. This phase includes three important activities:

1. The author submits a proposal for the thesis topic.
2. The author is assigned a supervisor for the thesis.
3. The author registers for the course.

Phase 2 – Research Question and Method

The goal of this phase is to produce a draft of parts I, II, and III of the thesis. This phase includes three important activities:

1. The author submits their Phase 2 draft, see section 5.2.
2. The reviewer provides feedback on the Phase 2 draft and indicates whether further action is needed (green or red light).
3. The supervisor forwards the reviewer's feedback on the draft to the author and initiates a dialogue with the reviewer if necessary.

If a red light is given, steps 1 and 2 need to be repeated.

Phase 3 – Results and Discussion

The goal of this phase is to produce a draft of parts I – V of the thesis. The draft should be of sufficient quality for the originality and significance of the contributions to be assessed. This phase includes three important activities:

1. The author submits a draft of parts I – V of the thesis to the supervisor.
2. The supervisor provides feedback on the draft to the author.
3. The supervisor approves the proposal.

In some cases, steps 1 and 2 may need to be repeated several times before the proposal is approved.

Phase 4 – Final Seminar

The goal of this phase is to complete the thesis and conduct a final seminar. This phase includes several important events:

1. The author submits a draft of the entire thesis to the supervisor; the draft should use the thesis template and include an abstract.
2. The supervisor checks that the proposal is of sufficient quality to be approved by the examiner.
3. The supervisor schedules a final seminar at least eight working days before the final seminar date. For this to be scheduled, the Phase 2 review must be approved in SciPro.
4. The author submits the thesis so that other students have access to it at least six working days before the final seminar date.
5. The opponent submits their opponent report.
6. A final seminar is held, in which the author, supervisor, opponent, and other students participate.
7. The author and the supervisor agree on the revisions needed before the final thesis is submitted to the examiner in Phase 5.

In some cases, steps 1 and 2 may need to be repeated several times before the proposal is approved.

Phase 5 – Examination

The goal of this phase is to finalize the grade for the thesis.

1. The author submits the revised thesis.
2. The supervisor submits their documentation within five working days.
3. The examiner grades the thesis within ten working days; if the thesis is not approved, the examiner submits an examination report.

4. The supervisor sends the examination report and other comments to the author, who then submits a revised thesis to the supervisor along with an update report (this step applies only if the thesis was not approved in step 3).
5. The supervisor submits the revised thesis and an update report to the examiner. The update report describes how each comment in the examination report has been addressed in the revised thesis (this step applies only if the thesis was not approved in step 3).
6. Return to step 3.

5 Thesis Documents

There are four documents that must be written during the thesis process: the thesis itself, the Phase 2 draft, the opposition report, and the reflection document.

5.1 The Thesis

It is possible to structure a thesis according to the grading criteria. It will then consist of the following components:

- Abstract (grading criterion U1)
- Part I, which includes the introduction, problem, and research question (grading criteria U2 – U4)
- Part II, which provides scientific grounding (grading criterion U5)
- Part III, which covers the method (grading criteria U6 and U7)
- Part IV, which presents the thesis results (grading criterion U8)
- Part V, which presents the thesis conclusions and discusses them (grading criterion U9)
- References (grading criterion U12)
- Appendices (optional)

Each of Parts I – V can correspond to exactly one chapter, but sometimes it may be appropriate to have more than one chapter for a part. The above structure (commonly referred to as IMRAD) usually works well for empirical studies. It can also work for design-oriented studies, but sometimes for these, it may be more appropriate to use a structure based on the activities in such a study, see for example chapter 10 in [3].

A thesis should maintain a proper balance between its parts. While it is difficult to prescribe exact lengths, considering how much time each part typically requires can be helpful. An estimate for this is as follows:

- Introduction: 10%
- Scientific grounding: 20%
- Method selection: 5%
- Results development (data collection, data analysis, artifact design, etc.): 50%
- Discussion: 10%
- Finalization of text (proofreading, typography, reference list, etc.): 5%

For a master's thesis of 10,000 words, this can result in the following distribution:

- Introduction, 1,000 words
- Scientific grounding, 2,000 words
- Method selection and application, 1,500 words
- Results, 4,000 words
- Discussion, 1,500 words

The thesis template must be used for the thesis (or an equivalent with the exact same appearance).

5.2 The Phase 2 Draft

The Phase 2 draft should include drafts of Parts I, II, and III of the thesis, but for Part III, only the method selection is required. The draft should be of sufficient quality to effectively guide the remainder of the thesis work. The same thesis template as for the thesis itself should be used, and the abstract should also be filled in (except for results and discussion).

5.3 The Opposition Report

The purpose of the opposition is to provide constructive criticism on a thesis so that its author receives feedback for improvement and reflection. The opposition report consists of two parts:

- Review and critique of the thesis content, especially scientific grounding, method, and results. This corresponds to grading criteria U1 – U9 and U13. This part is the most important in the opposition report and forms the basis for the discussion at the final seminar.

- Editing and proofreading
 - Editing of the thesis. This means reviewing the thesis’s argumentation to determine if it is reasonable, easy to understand, logically coherent, well-founded, clear, concise, and tailored to the reader; see grading criterion U11. For more information on editing, see the section “Editing” in [4].
 - Proofreading of the thesis. This means reviewing the thesis for spelling, punctuation, grammar, language use, typography, layout, and reference handling; see grading criteria U10 and U12. For more information on proofreading, see the section “Proofreading” in [4].

5.4 The Reflection Document

The reflection document should at least answer the following questions:

- How does your thesis align with the objectives of the thesis course? Why? Focus on the objectives that were particularly well met and those that were less well met.
- How did the planning for the thesis work? What could have been done better?
- How does the thesis relate to your education? Which courses and areas have been most relevant to the thesis?
- How valuable is the thesis for your future work and/or studies?
- How satisfied are you with the execution and outcome of the thesis? Why?
- Which AI tools or similar tools did you use in the thesis process, and how did you use them? How well did the tools work? Please provide some examples.

The reflection document should be 800 – 1,000 words long.

6 Glossary

DATA ANALYSIS METHOD. A data analysis method is a method for analyzing collected data. It can include statistical methods or methods for analyzing qualitative data, such as content analysis. Descriptive statistics can also be considered a data analysis method.

DATA COLLECTION METHOD. A data collection method is a method for gathering data. Common data collection methods include interviews, surveys, observations, and document studies.

DESIGN RESEARCH. Design research involves developing artifacts. This includes defining the requirements for a proposed artifact, evaluating it, and examining its effects on the environment in which it is intended to be used.

EMPIRICAL RESEARCH. Empirical research involves generating new knowledge through direct or indirect observation.

RESEARCH METHOD. A research method is either a data collection method or a data analysis method.

RESEARCH STRATEGY. A research strategy provides a framework for structuring a research project. Common research strategies include mapping, case study, experiment, and action research.

RESEARCH QUESTION. A research question is usually formulated as a question, for example, “What problems do elderly users experience with grocery store self-scanning systems?” This is an example of a research question that is answered through an empirical study. Other research questions can be answered by developing an artifact and gaining knowledge about it and its environment. An example is “How should a self-scanning system in grocery stores be designed to be suitable for elderly users?” Sometimes it is

appropriate to formulate the research question as a goal, such as “The goal is to design a self-scanning system in grocery stores that is suitable for elderly users.” The research question should relate to the problem, meaning it should be clear that by answering the research question, one contributes to solving the problem. A research question should be of general interest, meaning it should be interesting not only for a single individual or organization. An example of a research question that is unlikely to be of general interest is “Does the user interface affect the acceptance of the DAISY 1.1 system at the Department of Computer and Systems Sciences at SU?” However, this question can be broadened in various ways to make it of general interest, for example, “Does the user interface affect the acceptance of educational administrative systems?”

PROBLEM. A practical problem is often a situation that involves or causes significant difficulties, disadvantages, or risks for people or organizations, such as health hazards for people, companies losing revenue, or citizens receiving poor service from authorities. A practical problem can also involve new opportunities, such as how tablets could be used in healthcare and social care. A theoretical problem is a lack of knowledge that results in having less understanding of a phenomenon than desired, such as lacking knowledge about the complexity characteristics of an algorithm or the reasons behind the popularity of social media. A problem should be of general interest.

RESULTS. For an empirical study, the result is what emerges after the collected data has been analyzed. For a design-oriented study, the developed artifact is also part of the result.

Bibliography

- [1] Denscombe. *The Good Research Guide, 6th Edition*. en. 6th ed. Open University Press, June 2017.
- [2] Kjell Granström. *Lathund för rapportskrivning. Om konsten att berätta om sitt utvecklingsarbete*. <https://www.ida.liu.se/~TDDD86/info/misc/lathund-rapportskrivning-rev-2011.pdf>. 2011.
- [3] Paul Johannesson and Erik Perjons. *An Introduction to Design Science*. <https://link.springer.com/book/10.1007/978-3-319-10632-8>. 2014.
- [4] Ervin Raymundo. *Guide to Editing and Proofreading*. https://www.academia.edu/33691612/Guide_to_Editing_and_Proofreading. Accessed: 2024-7-22.