

MASTER CSAI guidelines for students

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Objectives

With the Master Thesis project students of the Cognitive Science and Artificial

intelligence program demonstrate their mastery of the Cognitive Science and Artificial intelligence domain they acquired through the program. During this program, students learn to combine knowledge of cognitive science and artificial intelligence with techniques such as advanced deep learning, deep reinforcement learning and Bayesian modeling. They investigate various aspects of intelligence, such as reasoning, learning, perception, communication, and collaboration from both a human perspective and a machine perspective. The thesis project is an opportunity to apply all the learnings in a creative setting where they answer the research questions they begin with.

The first step is to formulate a research goal and put together a research proposal. Then the students present their progress in a public setting with their peers and faculty members to collect input and provide input to their peers.

The final deliverables include a thesis report accompanied by a code deliverable and a short demo.

Learning Goals

After successful completion of this course, the student will be able to:

1. Problem Statement & Research Goal
 1. Illustrate the societal relevance of the thesis research goal
 2. Formulate (a) clear and specific research question(s) based on identified gaps in literature that lead to solving the research goal.
 3. Formulate hypotheses derived from theory/ideas in the domains of Cognitive Science and/or Artificial Intelligence
 4. Organise research question in logical and feasible research strategy, with the help of sub-questions.
2. Literature
 1. Summarise existing literature on scientific/technological principles, methods and results applied to a particular problem in the domains of Cognitive Science and/or Artificial Intelligence (research goal).
 2. Review literature critically to identify research gap in relation to research goal
3. Method
 1. Summarize the method(s) that will be applied towards the research goals
 2. Argue why chosen method(s) is/are most appropriate, in contrast to other methods, to approach RQs
 3. Perform the design, analysis, implementation, and verification of Cognitive Science and/or Artificial Intelligence systems with specialist tools and techniques
4. Results

1. Accurately illustrate the results of the project plan numerically and graphically
2. Illustrate robustness and consistency of results in a transparent manner
5. Discussion/Conclusion
 1. Interpret the significance, robustness, and novelty of the results in relation to the literature
 2. Review the strengths and weaknesses of the method implementation and current results in relation to the research goal
 3. Conclude on the contribution of the thesis to its research goal and societal relevance and plan follow up research.
 4. Offer constructive criticism on the written reports or oral presentations of peers.
6. Form & Presentation
 1. Perform formatting of a thesis conforming to TiU specifications, including rules for citations
 2. Avoid plagiarism in the thesis
 3. Put together a logically structured scientific manuscript
 4. Demonstrate presentation skills required to effectively communicate rationale, findings and interpretation of results to peers in oral presentation

Documentation

All documentation (including for the thesis, the proposal, the presentation, and the poster session) will be available in the Modules in the corresponding canvas course page.

Requirements

A student can begin the Master's thesis once 60 ECTS credits in courses belonging to the program have been completed and at least one Research Skills course has been completed.

This is stated in the [EER](#)

Deliverables and steps in the assessment

A CSAI Master's thesis consists of a formal proposal, a poster presentation, a written thesis with annotated code, and a demo.

Timeline related notes

Please be aware, the regular supervision meetings end with the first submission deadline. The deadline is available in the Canvas course page.

The students will be given feedback for their first attempt and can use this to improve their work for the second submission.

The deadlines are strict and for fairness purposes, we do not deviate from them on individual basis unless there is a valid reason delaying student's work.

For personal circumstances that delay your thesis work, contact your study advisor as soon as possible, do not wait till last minute, or till you figure out you will not meet the deadline. Processing of any request will take time (requires communication among your study advisor, thesis coordinator and, your supervisor) which is not ideal for you.

Frequently asked questions

- Who should I talk to if I having a question or a problem that isn't answered on this list?
 - A question about a personal issue: reach out to your study advisor
 - Your study advisor is a great first stop for nearly all questions, she can point you in the right direction about who can help given your situation.
 - A question or issue with the Master thesis procedures: send an e-mail to (msc-csai-thesis@tilburguniversity.edu) to be answered by Dr. [Çiçek Güven](#)
 - A question or issue with the Master program as a whole: Dr. [Henry Brighton](#)
- What happens if I do not pass my thesis proposal?
 - If your thesis proposal does not receive a passing evaluation, then you will have to restart with a new thesis topic next semester .
- What happens if I am not able to finish my thesis or get a passing grade by the second submission deadline this semester?
 - Most likely you will need to enroll via Osiris in the Master Thesis course for the following semester. If this happens, you should discuss your situation with your current supervisor or thesis coordinators.
 - Is it possible to get an extension for working on my thesis?
 - No extensions are possible, for either the first or second submission deadline, unless a special circumstance is approved by the thesis coordinator, your supervisor and the study advisor. To begin this process, please contact your study advisor.
 - For the final thesis evaluation, does the failing or passing depend on the average of all components?
 - For a student who submitted a thesis, their grade for all individual components should be a passing grade (that is 6) for them to pass for the report (each criteria (for example form and presentation) should have a passing grade from both readers).

- There are also deliverables with a pass/fail grade. The student should have a sufficient grade for all the final deliverables to pass from the course, that is, a 6 from the report and pass from all other deliverables
- Where can I find information about Tuition fees in case of a graduation delay?
 - This is a general question. There is a webpage about tuition fees and payment and registration (see below). It may help but sometimes the questions are very specific and then students can always contact their study advisor. Thesis coordinators are not the point of contact for financial matters.
- Can I see previous theses examples?
 - See [here](#)

Academic Writing

Scriptorium: guidance for academic writing

When working on a paper or your thesis, the scriptorium provides a fresh perspective on your text. Moreover, they can help you with the writing process.

The scriptorium services are free for all Tilburg University students writing in English or Dutch.

Difference between bachelor and master thesis students/expectations

BACHELOR

Can apply knowledge in various familiar situations

Can work under supervision; average level of autonomy

Can approach/tackle and solve (relatively) basic problems/questions

Can develop knowledge and skills/competences from related disciplines

MASTER

Can apply knowledge in new situations

Can work independently; high level of autonomy

Can approach/tackle and solve (more) complex problems

Can develop knowledge and skills/competences from various disciplines

Can integrate and apply knowledge and skills/competences in relatively basic problems/questions

Can integrate and apply knowledge and skills/competences in more complex problems

Can participate in the research process

Can adjust the research process to meet the demands of the task at hand

Has necessary knowledge of the disciplines to judge the relevance of new developments, and can translate this to own domain

Can plan and perform scientific research and can reflect on the phases of the research process

Can communicate opinions, ideas, information and results clearly

Can communicate conclusions, including the underlying knowledge, motives and deliberations clearly, convincingly and unambiguously

Information about data collection: student research with human participants

if you are willing to collect data for your thesis, please see [here](#) under Research by BA/MA students.

There you can find a [flowchart](#) regarding "Evaluation procedure student research with human participants" and a [checklist](#) for your supervisor.

The statement below is from the listed website.

To determine whether the REDC can evaluate student research projects, supervisors can use [this flowchart](#).

"The REDC expects that both supervisor and student adhere to responsible research practices, and encourages ethical reflection, data management, and GDPR compliance to be part of the supervision. Therefore, the REDC does in principle not review student research, as this is regarded as a shared responsibility of student and supervisor. Supervisors can use [this checklist](#) to evaluate student projects.

- There are two exceptions:
 - The student's research is part of the research line of the supervisor.
 - The supervisor and student intent to publish the student's research in a journal that requires ethical clearance of the student's research.
- If one of the two criteria stated above are met, the supervisor and student can apply for ethical clearance
- Approval cannot be obtained after a study has been started or conducted.

More information on data management and handling personal data in the context of student research can be found through [this handout](#) or [this libguide](#)."

Assessment of the CSAI Master Thesis

The point grade of the thesis course is determined by the grade on the thesis report. The pass/fail deliverables are mandatory.

The CSAI Master Thesis report is evaluated by two independent examiners. Each examiner evaluates the thesis report on 6 rubric items, each scored with a grade between 5 and 10 (inclusive; a 5.5 cannot be given) where the grade "5" stands in for a "fail" on this rubric item without further specification. The overall grade is determined by first taking the unweighted average of each rubric item and rounding this average. In the second step, the unweighted average of these averaged rubric items is taken and rounded according to TiU policy. If the grades on any rubric item diverge by more than 1.0 grade between examiners, the grade is discussed. If there is disagreement on failing a particular rubric item between examiners, the thesis is discussed. In case of persistent disagreement, a third reader will be engaged. A thesis that results in a final fail on any rubric component, fails overall. Students can resit the thesis, also if it already passed on 1st submission: the thesis with the higher overall grade will stand. Using a second submission opportunity for the thesis does currently not impact graduating with distinction.

Thesis Report guidelines

The thesis document should be aligned with the template provided. The references must be properly cited. The text should have an academic tone and a good storyline.

Elements of your report

The thesis consists of the following sections:

- o Title page
- o Abstract
- o Introduction
- o Related Work
- o Methods/ Experimental Setup

- o Results
- o Discussion
- o Conclusion
- o Acknowledgements (optional)
- o References
- o Appendices and Supplementary Materials (optional)

Title page

Contains the title, author and other standard information. The title summarizes the substance of your thesis. Typically, it informs readers about what the research topic is and how it is being investigated; findings and other details are usually left out. Ideally, it should be less than 12-15 words. Here are some rules of thumb for formulating the title:

- o Be clear and avoid ambiguity;
- o Avoid being overly general or vague;
- o Be succinct; the finer details should be included in the Abstract (see section below).

Abstract

The summary is a very brief but self-contained account of your thesis. It should be around 150-250 words. The following points should be addressed:

- o What problem is being investigated?
- o What is your research question? The research question should follow from how other researchers addressed the problem (i.e., in terms of approach, focus, etc.) in the past.
- o What is the contribution of this work?
- o What dataset are you using?
- o What are the main findings?

Introduction

Explain what your research questions are, why they are important and relevant (societal relevance of the thesis research goal), how you approached them, and what your findings were.

You should motivate your work scientifically. Your research questions should be clear. Structuring them in the form of main and sub questions often helps.

Context The goal of the study provides a good starting point for the report and introduction. Describe the context of your thesis in a very concise manner. Explain briefly the research domain, what the state-of-the-art is, and why the subject matter

is interesting. The references in this section are mostly to motivate the question at hand. The literature is discussed separately in the related work section.

Devote one paragraph of the introduction explicitly to the scientific relevance of your project and your contribution. Note that scientific relevance could be derived from the domain specific research question addressed in your research, or in the proposal of a new algorithm or approach.

Research questions Once the context is established, specify your research questions. Describe very briefly how each research question will be answered. Your research questions should be specific. If the project is an experiment, all research questions should be operationalized in empirical hypotheses. Research strategy and goals should be linked clearly.

Findings. Give a brief (one paragraph) overview of your main findings.

Related work / Literature

The purpose of this section is to put your work in perspective in relation to the existing work. Review literature critically to identify research gap in relation to research goal. You should find relevant studies, link them to another and to your work in a critical manner.

Related work, sometimes labeled as theoretical framework or background, is a crucial element of your thesis. Explain the larger scientific context of the problem: what is the theory behind it if any, what previous research has been done related to it, and how your work builds on this related research. Below are some step-by-step guidelines for writing this section:

Specify the area of research in which your work belongs and provide a context for the research focus. What research issue is your work focused on? Why is it an issue of importance?

Describe relevant work conducted in the same research area (with proper references). Has this issue been addressed in the literature? By whom? What have they done and found? What are the relevant theories? Are there any contradicting findings or competing models/theories? What is the state of the art?

Identify research gaps and/or shortcomings of existing method; define research problems:

- What is missing from prior research? What are the limitations of existing models? Could there be alternative approaches to solving the same problems?
- Specifically, what research problems are left unanswered? What insights or implications will you tackling these research problems bring about?

Discuss the research questions and goals of current work with the methodology you are going to adopt. What are you trying to achieve with the current work? How are you going to fill the research gaps? What sets your work apart from prior research?

Common problems and remedies:

X Failure to maintain focus on the research question, by including references to studies that are only remotely related to yours.

✓ Make sure you are not trying to impress the readers by the broad scope of your knowledge, thereby forgetting that they are interested in your current research only.

X Failure to support statements with adequate references.

✓ Always give credit where credit is due. If you are making a statement along the lines of: It has been established in prior research that..., make sure you follow the statement with references.

X Failure to express arguments or ideas in your own words.

✓ It is not acceptable to simply paraphrase the work of someone else by changing a few words here and there, without acknowledging the source. If you must include a direct quote, enclose it with quotation marks and specify the page number in your reference. Failure to do so is a case of plagiarism and can lead to severe consequences!

X Failure to include references to recent work.

✓ Whilst certain dated works remain important and are still widely cited (e.g., Gold, 1967, if the research concerns grammatical inference), try to stay on top of developments in the field and refer to the more recent literature.

X Failure to critically reflect on the literature.

✓ Demonstrate awareness of relations among existing models or studies by specifying any relevant commonality, contradiction, or inconsistency among them. X Failure to give a convincing rationale for conducting the current study.

✓ Explain how the current work continues and improves upon previous lines of enquiry. Be explicit about the contribution of the current work

Methods

In this section, you are expected to summarise the method(s) that will be applied towards the research goals. Argue why chosen method(s) is/are most appropriate, in contrast to other methods, to approach RQs

This section has a technical nature, discussing the design, analysis, implementation.

Research method(s) and approaches should be explained. Motivation for the approach should be provided, in contrast to alternatives. Methodology should illustrate reproducible approach including dataset(s), algorithms, and explain how they are organised with a visualisation when relevant.

In this section you describe your general approach, for example which experimental methods, mathematical models or computational algorithms you used. This section should describe in detail exactly what you did. This section often contains a

combination of mathematical formulas, diagrams, and verbal descriptions. The following information should be covered:

o Description of the experimental procedure:

- Was it research done on humans or simulations?
- How was the population recruited and the test administered?
- What was the task participants completed?
- In the case of simulations, which algorithm was used, which parameters were chosen and how.

o Description of your dataset (if relevant): the organization offering the dataset, sample size, how and when the data was collected, which features could be found in the data, and any other relevant information

- Where appropriate, report descriptive statistics to offer a better impression of the dataset.

-Cleaning / pre-processing of data: was there any oddity (e.g., error) in the dataset and what was done about it, which parts of the data were discarded and why, whether or not certain features were transformed and why, what was done about the missing values and why, and any other preprocessing done

- Always justify your decisions with theoretical and/or statistical arguments

o Description of the actual implementation, i.e., programming languages and versions, packages used, proprietary applications supporting the coding, cross-validation methods, etc.

o Description of evaluation criteria

Common problems and remedies:

X Symbols in formulas are not defined or explained.

✓ Make sure that it's clear what the notation stands for.

X Failure to list all important details.

✓ Always write with other researchers in mind and include all relevant details. When in doubt, ask yourself: If I were to leave this piece of information out, would other researchers be able to reproduce my work?

X Failure to justify choices made.

✓ Always be explicit about the rationale for making certain choices; they should be made on theoretical (e.g., prior research), methodological (e.g., algorithmic bias) or empirical grounds (i.e. tuning on validation data). For example, it is better to use only one or two algorithms properly than trying out every algorithm under the sun without proper justification and in a superficial way.

Results

In this section accurate illustration of the the results of the project plan expected from you, numerically and graphically. You should illustrate robustness and consistency of results in a transparent manner.

Research execution has been performed Consistently and correct research execution is expected and this should be evident in the results section. You should presents the results of the research in a clear, transparent, robust, and original manner. Provide visualizations of results in a clearly interpretable, and in a way covering the scope of the results. Please provide detailed and insightful multi-level evaluation of CS/AI model performance.

In this section, you report your results, often with the help of statistics, tables, and figures. Below are some guidelines:

o Present your results in a structured manner, often with the help of tables or figures.

- In your text, do not simply restate the information listed in the tables or figures. Try to make sense of the results, highlighting important or interesting findings that you might revisit in the discussion section. The figures are not the presentation of your results but their illustration.
- Do not leave information presented in tables or figures unexplained. You have included information there for a reason, so take the time to go through it (e.g., explain what each column is about).
- Provide high quality clear figures with well-sized legends and informative captions.
- Do not cluster tables and figures – there should always be some text in between.
- Larger tables (with more than ca. 10-15 rows) should be placed in the appendix.

o Where appropriate, explore the results further by means of statistical analysis, confusion matrices, or visualizations

- The goal is to obtain a more fine-grained understanding of your results, uncovering patterns that might not be obvious from the overall results (for example, does the overall pattern of results hold across ages and genders? Or, in the case of a AI model, does the predictive performance of the model differ greatly between classes).

Common problems and remedies:

X Failure to report the baseline performance.

✓ Always report the baseline performance, as it is difficult to interpret the results without knowing the basis for comparison (e.g., previous research, chance-level performance, etc.) X Failure to interpret information listed in tables and figures.

✓ Instead of simply restating what is listed in the tables and figures, explain the substantive meaning of your findings such that your readers know what they should focus on .

X Failure to use the correct type of figure.

✓ Consult scholarly articles and books to see which type of figure is appropriate for which visualisation purpose.

X Failure to format numbers according to English-language conventions.

✓ Make sure you use decimal points, and commas as thousand separators (i.e. 1.2 and 10,000)

Example structure for reporting results:

o First, describe in one or two sentence(s) what results will be reported in this section. For example: In this section, classification performance for the feature types described in section 3 on X dataset will be presented.

o Describe the model performance or statistical results, which can be listed in a table. Be clear about which tables or figures you are referring to. Do not simply repeat the information found in the table. Summarize and explain the analyses.

o Explore your results further: consider evaluating using cross-validation, or splitting your analysis across demographic classes.

Discussion

In this section, you are expected to interpret the significance, robustness, and novelty of the results in relation to the literature. Review the strengths and weaknesses of the method implementation and current results in relation to the research goal.

In this section, you should evaluate your results with regard to the research questions listed in the introduction. The following are some recommended elements:

o Remind you readers what the goal of your study was.

o Discuss the findings, preferably in the same order in which they were presented in the results section.

o If a finding was surprising, you should offer reasonable speculations as to why this particular result was observed.

o It could be the case that your results only partially answered your research questions due to limitations of the model or the data. Acknowledge these limitations, offer possible solutions, and defend the validity of your results.

o Put your results in perspective by making links to the literature.

o Make very clear what the contribution of your study is within the existing framework.

Common problems and remedies:

X Failure to provide context for the results

✓ The discussion section should be understandable when standing alone. It is important that you spell out your research questions and goals again, so that researchers who only read this section can still have a good idea of what your findings are.

Conclusion

In this section, you expected to conclude on the contribution of the thesis to its research goal and societal relevance and plan follow up research.

Conclusion is a short section where you restate the research questions and provide the answers to them by combining the results you obtained with a very brief summary of how they can be placed in the context of existing research. Here you also explain the implications of your work for the field, and identify which directions future research could take, on the basis of the contribution of your study.

Discussion and Conclusions are graded under a single criteria.

The expectancy is the student to provide clear and critical interpretations, and to draw conclusions with reference to the research question(s). The weakness of the results and the limitations must be discussed, with possible other approaches. Conclusions must be substantiated by results.

Self-reflection

In this section, you will reflect on your activities and learning process during the thesis project, in relation to the learning goals defined for the project.

Acknowledgements

In this brief section you can acknowledge sources of funding, data, code, or anyone who helped you with your research.

References

It is mandatory to use an approved citation style such as APA7 or IEEE.

Appendices and Supplementary Materials

Appendices are appropriate for extra, non-essential visualizations, examples and analyses.

It is strongly encouraged, whenever possible, to store data and source code in an online repository and refer to it in the manuscript. Github.com is a common choice.

Copyright and collaboration

Do not reuse any figures or other images without a proper license or permission of the author; if you have the permission, the author still needs to be credited. See also the Data/Code/Ethics statement section

If you collaborated with someone else on some part of the project, indicate clearly which part of the work you are building upon was done by something else.

Plagiarism/Overlap

Make sure your thesis does not contain unacknowledged quotes or paraphrases as these could be detected as cases of plagiarism. Please consult the plagiarism FAQ in the Canvas course and the policy regarding overlap at the School level:

<https://www.tilburguniversity.edu/students/studying/regulations/eer/humanities>
Textual/conceptual overlap indicative of plagiarism is grounds for failing a thesis submission.

Ethical Standards Compliance document for Students

Statement of Technology requirement in assignments and Data
Source/Code/Ethics/Technology Statement requirement for theses of our programs
14-02-2023 Version 1

Students are expected to do their own work and act with integrity.

The Tilburg University Code of Conduct explains the critical importance of students doing their own work and assignments:

“You do assignments and write papers and theses yourself. You do not allow others to do assignments or write papers and theses (commercially or otherwise) and pretend that this is your own work. You can seek help to improve your texts or translation if you inform your supervisor about this.” - Theme 6, Good Education Practice.

The Code of Conduct also stresses the principle of integrity: "Integrity implies that staff and students are prepared and equipped to carry out their duties or studies adequately, carefully, and reliably, keeping in mind at all times the values and interests that are at stake.

Integrity is conducive to openness and implies considerate interaction between staff and students. It means that anyone who works at and for Tilburg University, studies, or obtains a PhD is reliable. You do not allow yourself to be guided by self-interest and self-gain." The principle of Integrity guides our expectations regarding thesis projects, assignments, exams, and other project deliverables:

First, we expect students to take the time to inform themselves of the meaning and risks of plagiarism (See the Plagiarism FAQ below).

Second, we acknowledge that there are many technologies that students can use to improve their work and, instead of prohibiting these technologies, we believe it is more important that students (1) understand when it is appropriate to use these technologies, (2) rigorously document and acknowledge how they used these technologies, and (3) take full responsibility for their use of these technologies. The use of technologies to generate content (such as parts of programming code, text, charts, images, etc.) must be documented in a statement of technology. Students who submit assignments are responsible for the full content of the assignments and must be aware that eventual flaws in the technology can never be a reason for lenience in grading. For example, if a student submits work that has been checked by a spell checker yet still contains spelling errors, the spelling errors will still be attributed to the student. Students must be aware that any assignment they submit must adhere to all the assignment's guidelines. In addition to being written well, the information contained in their submission should be correct. Text generated by external services / tools may easily fail on such criteria and is never guaranteed to be correct. Some of the many risks of reliance on generative technology are a lack of, or wholly incorrect, references to academic sources where the information

originates from and text being mostly descriptive/explanatory while lacking a clear analysis or critical perspective. Statements of fact in assignments must be checked and properly cited. Students should also be completely transparent about the work that inspired them, including any published or unpublished work, even their own. Students are expected to not only cite sources properly, but also to clearly indicate how their work is similar or different to these sources.

Third, in cases where data is used in a thesis that comes from another source, students must follow the best practices for [handling data](#) and acknowledge the source of the data. For theses, The Research Ethics and Data Management Committee (REDC) expects that both supervisor and student adhere to responsible research practices, and encourages ethical reflection, data management, and GDPR (General Data Protection Regulation) compliance to be part of the supervision.

Please visit [this page](#) for more information (focus on the Research by MA/BA students). Additional information on data management and handling personal data in the context of student research can be found in this [library guide](#).

Tilburg University research data management regulations can be found [here](#).

To ensure that these principles are upheld in every assignment, students are required to attach a Statement of Technology to their assignments and a more extensive Data Source/Code/Ethics Statement in their thesis to summarize how they comply with Tilburg University's Code of Conduct. For a thesis, all aspects of this checklist should be answered in this statement.

[Checklist for Ethical Statement of Thesis and Statement of Technology](#)

Please provide answers to all below questions for transparency purposes when writing your ethical statement. There is no one fits all solution to ethical statements, and they heavily depend on the nature of the study. After the questions below, some examples are provided.

- Data:

- o Who is the owner of the data?
- o Does the thesis project involve collecting data from human participants or animals?
- o Does the owner of the data give consent?
- o How and through what channel is the data acquired?

- Figures

- o Did you create all the images and figures?
- o Do you have consent for the images that you did not generate?

- Code

- o Did you use parts of the code from another study/someone else?
- o Did you list, including version number, all libraries and frameworks used?

- Writing:

- o Did you use any tools or services to paraphrase the given text (for example a thesaurus or the Academic Phrase bank)? Please name them.
- o Did you use any tools or services to check spelling or grammar? Please name them.
- o Did you use any tools or service to typeset the given text? Please name them.
- o Did you use any reference management software other than the latex template? If so, please name it.

Checklist for statement of technology can be generated by the questions listed above excluding the data source relevant questions when not applicable.

Data Source/Code/Ethics/Technology Statement Example

The (DATA) has been acquired from the (DATA SOURCE) through an online request. The obtained data is anonymised. Work on this thesis did not involve collecting data from human participants or animals. The original owner of the data and code used in this thesis retains ownership of the data and code during and after the completion of this thesis.

However, the institution was informed about the use of this data for this thesis and potential research publications.

All the figures but Figure A and B belong to the author. To use Figure A and Figure B, the author received written permission via an email from FIGURE OWNER (AFFILIATION). The thesis code can be accessed through the GitHub repository following the link [CODE LINK]. Part of the CODE has been adapted by the author from (SOURCE, licensed under a CC0 BY 4.0). The reused/adapted code fragments are clearly indicated in the notebook. In terms of writing, the author used assistance with the language of the paper. A generative language model (MODEL NAME + SOURCE) was used to improve the author's original content, for paraphrasing, spell checking and grammar. No other typesetting tools or services were used.

Use of Generative AI tools

We do not encourage our students to use any specific tool to generate text. Below, we list some of the risks and under what circumstances the use of generative AI tools may conflict with the learning outcomes. The following is inspired by the Association for Computational Linguistics (ACL policy: Using Generative AI tools for paraphrasing or improving the author's original content, rather than for suggesting new content is acceptable. How the technology has been used should be specified in the technology statement. Using the output of Generative AI tools without referring to them in the Statement of Technology or Data Source/Code/Ethics/Technology Statement will typically be deemed plagiarism. If there is any doubt about plagiarism, the case will be referred to the exam committee. In case generative text models are used as search engines, for example to find relevant literature; students must be aware using them to find original sources for ideas is not actually a guarantee that retrieved output is appropriate. Such use also should be specified in the technology statement. Students must be aware that there might be biases in the suggested literature. Students are responsible for the final submitted work and must check the validity of the content and provide citations for factual statements accordance with the requirements of the assignment.

When the output of a Generative AI tool includes new research ideas, it is likely that this is coming from other people's work. Using these would constitute plagiarism as other people's ideas must be always cited. Therefore, students can use Generative AI tools to improve their own text or use it to search for relevant literature. Students should always be aware of such tools' limitations, and that their use is at the students' own risk. Teachers are not expected to teach students how to use these tools. Students are obliged to inform the teacher if and for what purpose they used the tool. Any uses other than the ones listed above might constitute plagiarism and be forwarded to the Examination Committee. Output text from Generative AI cannot be interpreted as fact, cannot be weighted as such or cannot be counted towards the required number of cited works as the output is not peer-reviewed.

Frequently asked questions about plagiarism

1. What is plagiarism?

Tilburg University [defines](#) plagiarism as “using parts of a text written by someone else, or the reasoning or ideas of others, for a thesis or other assignment, without due acknowledgement”. There are different ways to acknowledge someone else’s work and ideas without committing plagiarism, such as [citations](#) and [paraphrasing](#).

2. Where can I find information on how the university and my program deal with plagiarism?

- On the university's page on [Fraud, cheating and plagiarism](#).
- In the [rules and regulations](#) of the school, in particular articles 15 and 16.

3. Should I only worry about plagiarism in written assignments?

No, the rules regarding plagiarism apply to any assignment (written or oral). Keep in mind that plagiarism applies when you use someone else’s words, but also when you present someone else’s ideas and reasoning as your own. Therefore, whenever you are presenting ideas or reasoning that are not originally yours in an academic setting, you should refer to the original source.

4. Is plagiarism limited to textual material?

No, plagiarism applies to any intellectual work created by others than yourself. For example, if you include (part of) a figure, table, or code produced by someone else in your work, then the original source must be added as reference. In some cases, such as figures, you may also need permission from the copyright holder to reproduce the material.

5. If I use synonyms when writing or presenting an idea or concept, is this enough to not be considered plagiarism of someone else’s work?

No, in order to avoid plagiarism, students must explain ideas and concepts using their own words and in such a way that their own understanding of the topic is made clear. The use of synonyms does not achieve this. Rephrasing another author’s idea using one’s own words and structuring, is called [paraphrasing](#). When paraphrasing, one should also refer to the original source of the concept or idea.

6. Do I always have to use a reference for any idea or concept that I did not create on my own?

No, there are ideas and concepts that are “common knowledge” and they do not need referencing when presented. For examples of *common knowledge*, please click [here](#). However, this does not mean you can use someone else’s presentation of that common knowledge.

7. Does it matter how much of my assignment/thesis is plagiarized?

No, once a lecturer suspects of plagiarism it is their duty to inform the Examination Board of this suspicion and an investigation procedure will be initiated.

8. Can I take ideas and concepts from non-scientific publications or from unpublished work without attribution?

No, plagiarism also applies to unpublished and non-scientific sources, including the work of other students.

9. Can I be sanctioned if I allow my work to be plagiarized?

Yes, students who make their exam or assignment available for other students to plagiarize can receive a sanction.

10. Am I obliged to inform the Examination Board if I know or suspect that another student has committed plagiarism?

Yes, students who possess evidence that other students committed fraud have the duty to report this to the Examination Board.

11. What if I committed plagiarism unintentionally? Does that make a difference?

No, plagiarism is never acceptable. When a lecturer suspects plagiarism, they must inform the Examination Board, which will conduct an investigation of the case and rule on the matter.

12. I committed plagiarism. What will happen to my grade?

If the Examination Board rules that you have committed plagiarism in an assignment or exam, the assignment or exam will be invalidated. No grade will be awarded to you. If the Examination Board rules that you have committed plagiarism in your thesis, a possible sanction is that you will have to start a completely new thesis. In some cases, the Examination Board may decide that you are allowed to take a resit for the exam or the thesis.

13. I have been referred to the Examination Board for plagiarism. What is the investigation procedure?

If the Examination Board has been informed of a possibility of plagiarism, they will start an administrative investigation of the matter. The lecturer will have provided the Examination Board with material leading to the suspicion. After examining the material, the Examination Board will ask the student and lecturer to gather more information. The student will have the opportunity to give their version of the facts. After the hearing the Examination Board will make a decision on the case.

14. What are the sanctions for plagiarism?

If plagiarism is established by the Examination Board, the submitted work is invalidated and thus not graded. The Board will then rule on the case, which may vary from a warning, to the exclusion of a one or more exams or assignment attempts for a given period of time (from three months to one year). The Examination Board can also propose to the Executive Board the definite termination of the enrollment in the program of the person concerned (see, [Rules and GuidelinesLinks to an external site.](#), article 16).