Formal Requirements and Procedure
How to write a thesis in the PRG

> The following information applies exclusively to students writing their thesis in the Pattern Recognition Group. Other groups may follow different rules and procedures.

Confirmation

Once you have decided to write your BSc or MSc thesis in the PRG, you must obtain formal approval from the Director of Studies before starting the project.

- BSc Thesis: Contact the office manager of the Director of Studies (Bettina Choffat) and request the *"green form"*.
- MSc Thesis: Follow the official *JMCS process*.

Research Proposal

The first task you are expected to complete is the preparation of a research proposal. Consult the document *"How to Prepare a Proposal"* available on the PRG website and on ILIAS for guidance on structure and content.

Send the finalized proposal to your supervisor for review. Based on the evaluation, the following outcomes are possible:

- If the proposal is well written, complete, and methodologically sound, you will receive approval to start the project.
- If the proposal contains only minor issues, you will receive written feedback (e.g. suggestions for improvement). The supervisor will indicate whether a revised version needs to be resubmitted.
- If the proposal contains major issues, an additional meeting will be scheduled to re-discuss and potentially revise the project topic.

Start and Duration

The thesis project officially starts once approval from the Director of Studies has been received and the research proposal has been approved by the supervisor.

- The BSc Thesis is worth 15 ECTS (including *Anleitung zu wissenschaftlichen Arbeiten*) and has a standard duration of five months.
- The MSc thesis is worth 30 ECTS and must be completed within six months.

Extensions are possible upon prior consultation with the supervisor.

Seminar Attendance

Attendance of the PRG seminar is mandatory for BSc and MSc students writing their thesis in our group. BSc do not need to register for the PRG seminar on CTS. MSc students need to register on Academia in case they want the seminar to count towards their JMCS study.

The PRG seminar takes place in the autumn and spring semesters; the content in spring and autumn differs slightly. The main difference is that the seminar offered in the spring semester is primarily intended for students writing a BSc or MSc thesis in our group, while the autumn edition is also open to students who wish the seminar to count towards their JMCS only (without writing a thesis in our group).

The content and schedule are described in the document *"Information for the Pattern Recognition Seminar"* available on ILIAS

Writing Tools

The thesis must be written using LaTeX; the use of Microsoft Word or similar word-processing software is not permitted.

Templates:

- BSc Thesis Template provided on the PRG website and on ILIAS.
- MSc Thesis Template available on the JMCS website.

In addition, we recommend using the following tools:

- `Overleaf`, `TeXmaker`, or similar tools for LaTeX editing.
- `Git` in combination with platforms such as `GitHub` or `GitLab` for version control and reproducible project management.
- `BibDesk`, `Zotero`, or similar tools for managing bibliographic references.
- `GraphViz` for creating graphs, trees, flowcharts, and related diagrams. Alternatively, `draw.io`, `OmniGraffle`, or `LucidChart` may be used (note that some tools are fee-based and/or platform-dependent).
- `GnuPlot` or `Matplotlib` for plotting data and experimental results (optionally with higher-level libraries such as `Seaborn`).

We also recommend using language support tools such as `DeepL` or `ChatGPT` to iteratively improve your own text fragments. However, we strongly discourage *under any circumstances* the generation of entire paragraphs using these tools. Students are expected to demonstrate sufficient academic maturity to critically evaluate and responsibly use the output of such systems.[1]

Length and Language

For BSc theses, an expected length of approximately 30 pages is appropriate; for MSc theses, around 50 pages are typical. These figures are intended as rough guidelines. The actual length of the thesis depends on the type, scope, and content of the scientific work.

BSc theses may be written in German or English, with English being strongly preferred.
MSc theses must be written in English.

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[1]Misuse of ChatGPT or similar tools may lead to an accusation of plagiarism.

Academic Writing

Students are expected to study the document *"From Research to Thesis: Principles of Scientific Writing and Argumentation"*, available on the PRG website and on ILIAS, very thoroughly. Engagement with this document is an integral part of the PRG seminar.

The content of the document must be clearly reflected throughout the final BSc or MSc thesis; failure to do so will result in significant grade deductions.

Submission

The final version of the thesis must be submitted as a single PDF file via eMail to your supervisor(s).
Printed copies are *not* required.

Assessment

The assessment of a Bachelor's thesis consists of three separate grades:

- *Bachelorarbeit*: Assessment of the final written version of the thesis.
- *Seminar*: Assessment of the project presentation delivered in the seminar (for details on the grading scheme, see the document *Information for the Pattern Recognition Seminar*).
- *Anleitung zu wissenschaftlichem Arbeiten*: Assessment of the scientific approach and working process. In most cases, this grade corresponds to the thesis grade. In exceptional cases, however, it may differ, for example to acknowledge an unusually high level of commitment, a particularly innovative contribution beyond the initially defined objectives, or an extensive and well-designed experimental evaluation.

The assessment of a Master's thesis consists of a single overall grade accompanied by written evaluations of the following aspects:

- Has the candidate reviewed, integrated and cited relevant scientific literatures sufficiently?
- Qualification of the scientific research work of the candidate in terms of work organisation, personal effort, aptitude, creativity.
- Relevance of addressed questions and quality of obtained results. Have the aims of the study been met?
- Analytical abilities and interpretation of the results.
- Editorial formulation and layout of the thesis including figures and tables.
- Independent workability of the candidate.

As a rule, submitted theses are graded within two to three weeks. Upon request, a meeting can be arranged to discuss the evaluation.

Theses with serious deficiencies are graded below 4.0 (insufficient). If deficiencies are correctable within a reasonable time, the initial submission may be rejected; upon successful revision within a defined period, a passing grade (typically 4.0) may still be awarded.