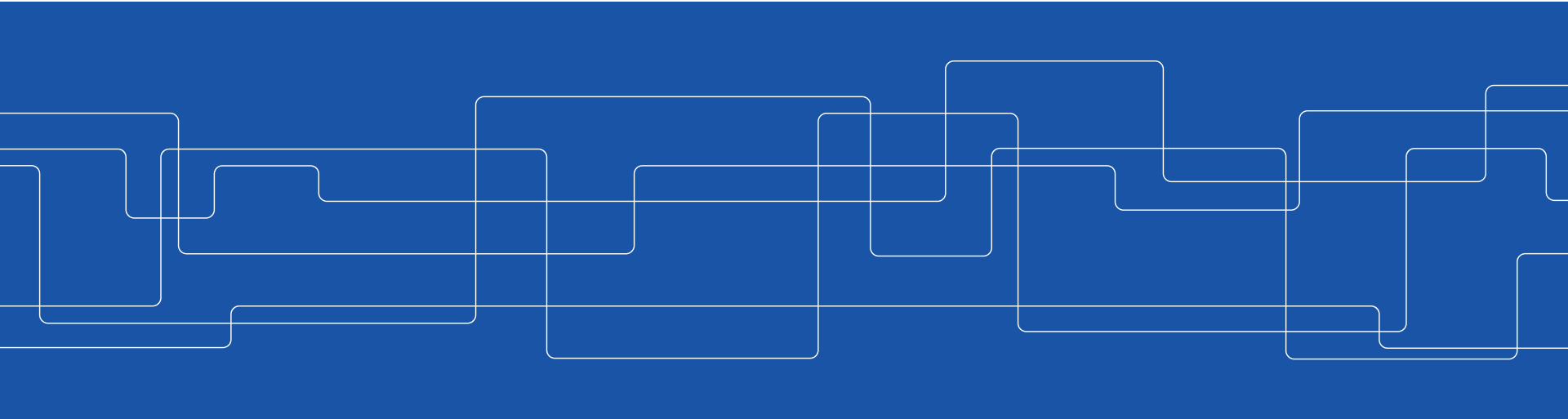
Useful Information for Starting a Degree Project at EECS 2021

Ragnar Thobaben

Degree Project Coordinator, Department of Intelligent Systems

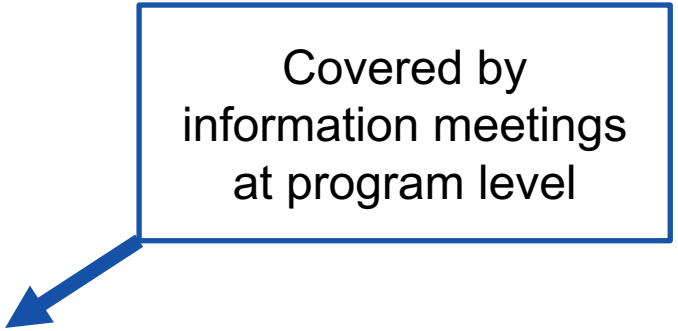


Outline

- General background
- Roles and Responsibilities
- Confidentiality, NDAs, and IPR
- How to find a project?
- Requirements
- Project Proposal
- Next steps

Not covered in this presentation

- Finding an examiner and supervisor
- Application for degree project
- Process of doing the thesis.



What is a Degree Project?

Largest, most important element of your educational programme

The degree project is organized as an independent project course.

The degree project course and its course code are listed in your program syllabus and on the programme web.

Bachelor Thesis, 15 hp

- Normally done in groups of two students

Master Thesis, 30 hp

- Individual thesis

What is a Degree Project?

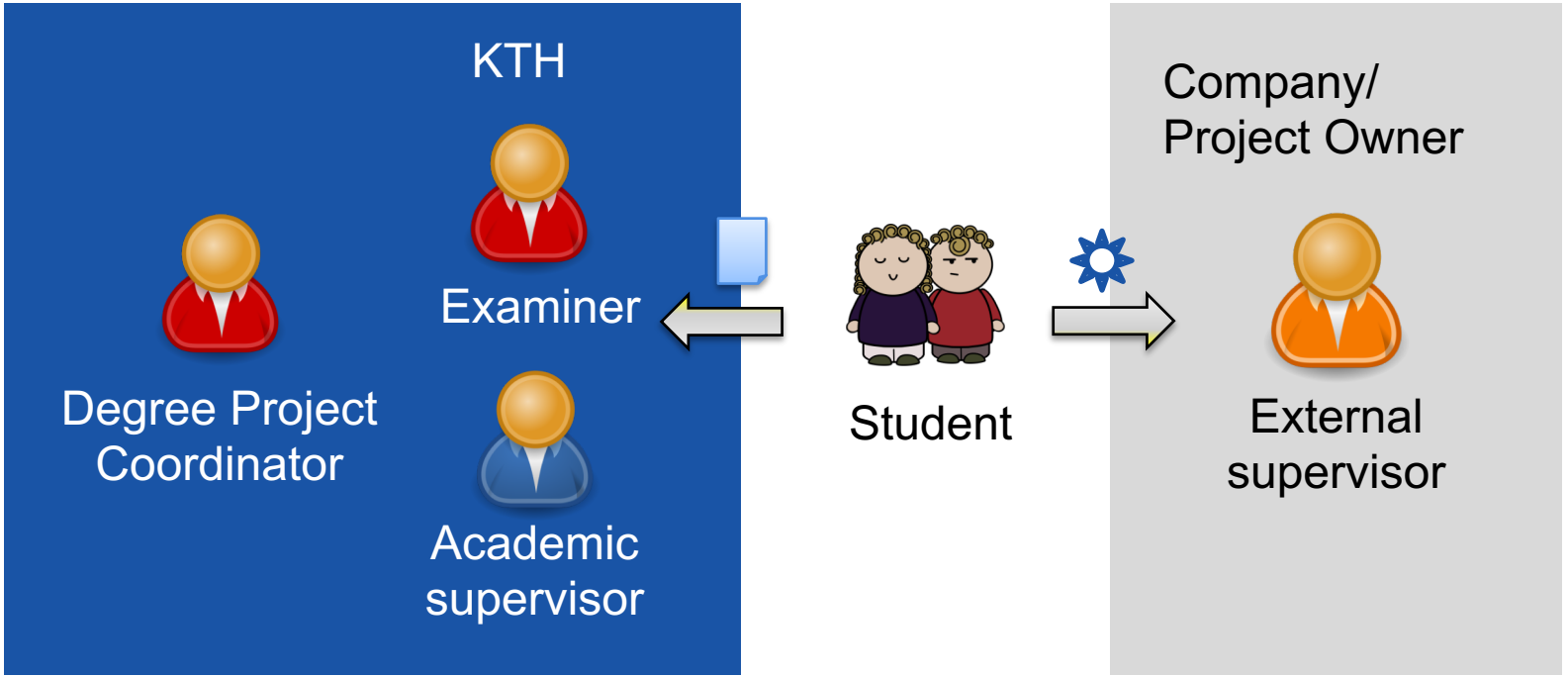
The examination of the thesis involves the following:

- Individual plan for degree project
- Active attendance at two oral presentations (1st cycle for BSc and 2nd cycle for MSc)
- Pre-study, discussion of method choice and literature study
- Written report with abstract in both Swedish and English
- Written and oral opposition of another student's degree project (1st cycle for BSc and 2nd cycle for MSc)
- Self-assessment report
- Oral presentation

General Requirements

- The degree project (30hp) is an individual project.
- The student needs to reach all course goals.
- The final report is always a public document regardless of whether it is published in DIVA or not.
- The degree project has to be completed within 12 months.

Who is involved?



Responsibilities

Student

- Responsible for reaching the goals, accountable for the outcomes of the project
- Plans and performs the research in the project
- Reports to the supervisors (KTH and host) about status, progress, etc.

Project owner

- Technical supervision at the host organization
- Provides necessary resources (e.g., access to know-how, licenses, data, working material, lab, workspace, support)

Responsibilities

Examiner

- **A teacher who is listed as examiner under your course code**
- Responsible for grading and quality
- Oversees the overall process
- Sometimes also involved in the supervision

Supervisor at KTH

- **Can be a teacher, PhD student, postdoc, researcher**
- Academic supervision (e.g., feedback on assignments, monitors progress towards the course goals)
- Technical supervision only if KTH is the project owner or if the supervisor is willing to make an extra commitment.

Degree project coordinator

- Course administration, Canvas, seminar announcements
- Helping students, supervisors, and examiners

Confidentiality, NDAs, and IPR

Confidentiality

- The final report is always a public document, and grading is performed on the final report.
- A thesis can have a confidential appendix, which however has to be considered irrelevant for grading.
- If a project owner requires that results are not disclosed under a certain period in time, you will not receive your grade during this period.

Confidentiality, NDAs, and IPR

Non-disclosure Agreements (NDA)

- Examiner and KTH supervisors are not allowed to sign NDAs for degree projects.
- Students can sign NDAs on their own behalf, but need to keep public access of the final report in mind.

Intellectual Property Rights (IPR)

- It is recommended to agree on ownership of ideas and results and compensation before the project starts and to document this in an agreement.

Note: KTH cannot provide support for contracts and agreements that you sign!

How to find a degree project?

Look out for prospective employers
- Companies' websites
- Linked-in
- Social networks

KTH (and other universities)
- Websites of research groups and individual researchers
- Websites of research centres and institutes
- Contact researchers within the area of your interest
- KTH Degree project portal

Other events
- EECS degree project fair
- Student union,…

When is an offered project good enough?

When looking for projects, it is important to look out for the following:

- Can you see that the proposed project will allow you to complete all course goals?
- Does the host organization have the competence and resources to support the project?
  - Is data, working material, lab space, licenses, required infrastructure available?
  - Is there a competent supervisor at the host, or will you need support from KTH beyond academic supervision?
- Is the project feasible and realistic in the given time frame?
- Does your profile match the proposed project?

Course Goals

The course goals are identical for all EECS degree project courses (second cycle) and can be found in the course syllabus (*kursplan*).

All course goals must be reached in order to pass the course!

Especially the first six goals are important for the choice of the project.

Course Goals

After passing the degree project course, the student should be able to:

> **Show advanced knowledge** within the main field of study/the specialisation for the education, including **advanced insight into current research and development work**

Guiding questions

- → What are the open issues that need to be solved? What are the challenges? Does it require a scientific approach (e.g., are there design decisions that need scientific justification)?
- → Is there already work published that addresses the same or similar problems? Can the project be related to current research trends? Check google scholar, survey articles, conference tutorials on YT!
- → Can you formulate interesting research questions?

Course Goals

After passing the degree project course, the student should be able to:

Show methodological knowledge within the main field of study/the specialisation for the education

Guiding questions

→ What kind of approach is required to do the project?

→ Does it require courses that you have taken (or not taken)?

→ Does it lie within or outside the scope of your programme?

Course Goals

After passing the degree project course, the student should be able to:

Participate in research and development work and thereby **contribute to the knowledge development**

Guiding questions

→ Which problems will you have solved?

→ Will the solution that you have come up with have a good “news value”?

→ Who else will be waiting for your results except for the project owner? Can solutions be transferred to other problems?

→ What is the expected impact of the project in the societal, industrial, and/or research context?

Course Goals

After passing the degree project course, the student should be able to:

> with a holistic approach, **critically, independently and creatively identify, formulate, analyse, assess and deal with complex phenomena and issues**, even with limited information

Guiding questions

→ Does the project allow for the necessary level of independence, and is it open enough for a critical and creative approach?

→ Is the problem sufficiently complex or does it have an obvious solution?

→ Does the project allow you to make own design decisions, formulate your own approach, or is it predetermined?

Course Goals

After passing the degree project course, the student should be able to:

> **plan and** with adequate methods **carry out qualified assignments within given frames**, and evaluate this work

Guiding questions

→ Does the project allow for the necessary level of independence in planning?

→ Are the goals at the right level (i.e., challenging but realistic)?

Course Goals

After passing the degree project course, the student should be able to:

integrate knowledge critically and systematically and **identify the need of additional knowledge**

Guiding questions

→ Does the solution require a combination of multiple skills and knowledge?

→ Which aspects of the project are new to you? Where do you need to read up?

Project Proposal

Project proposal is used by examiners to decide whether to accept or decline a proposed project.

EECS template on programme web

Challenge

- Translate the project owner’s project idea in to the EECS template
- Formulate research question, method,...
- Attract prospective examiners

Project Proposal

- Title
- Purpose and Aim
- Background
- Research Question
- Hypothesis
- Research Method
- Background of the Student
- Supervisor at the company
- Suggested examiner at KTH
- Resources
- Eligibility
- Study Planning

Can be found in
the programme web
under “Degree Projects”

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General Comment

You need to put work into this, look into background literature, get an idea of the state of the art and related research trends.

Copying and pasting from the project owner's description is often not sufficient.

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- What are the high-level goals of the project?

Project Proposal

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- Which research areas are relevant?
- How is the project related to current research and development?
- Why is the project relevant and for whom?
- What is the interest of the project owner?

Project Proposal

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Which research questions will the project answer?

The research questions should be focused, specific, feasible, sufficiently complex, and relevant

Avoid questions that can be answered with yes/no!

Project Proposal

Examples for different types of research questions (not complete)

Qualitative research questions

- Goal: build understanding, fill gaps in knowledge, new theory,…
- Exploratory questions: what and how …? **(be specific!)**
- Predictive question: extrapolate, predict impact in new contexts

Quantitative research questions

- Answering questions using measurable data
- Descriptive questions: when/where/why/how did something occur?
- Comparative questions: which method is more appropriate?
- Relationship based question: how does X affect Y?

Further advice: ask questions more in the problem domain rather than purely methodological (“which method is better?”).

Project Proposal

- Title
- Purpose and Aim
- Background
- Research Question
- **Hypothesis**
- Research Method
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What are the expected answers to your research questions?

Project Proposal

- Title
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Which method will be used?

If you have a qualitative research question,

- how do you approach it?
- Which theories, recent results will be used?
- Case studies, abstractions, models?

If you have a quantitative research question:

- What kind of data will be used, and is it available or does it need to be collected?
- How will you get the desired answers from the data? Which tools?
- What are candidate solutions?

Why and how will the results answer the research questions?

Project Proposal

- Title
- Purpose and Aim
- Background
- Research Question
- Hypothesis
- Research Method
- **Background of the Student**
- **Supervisor at the company**
- Suggested examiner at KTH
- **Resources**
- **Eligibility**
- **Study Planning**

Show that the project is feasible:

- Student has the right background; there is natural progression from previous studies by the student.
- The company has the required competences and resources (if not, how will issues be resolved?)
- There is no/only little interference from remaining course work.

Project Proposal

Additional comments

- Be aware that you need to balance and align the expectations of the companies with a research-oriented perspective at KTH.
- Interaction between KTH and company supervisor is recommended, especially when finalizing project proposal and specification (after starting the project).
- Different examiners have different view on where to draw the line between project proposal and project specification.

Next steps

- Check eligibility criteria for your programme (e.g., course syllabus).
- Make sure that all necessary course work is completed; try to find out about exemption rules if necessary (e.g., SVL).
- Find a project that interests you.
- Do the background research and write a project proposal.
- Look out for information meetings organized by course responsibles, coordinators, programme directors.
- Have a look at the programme web, check for updates.

Questions?