

A large, faded version of the Leiden University seal is centered in the background. It features a central figure holding a staff and a shield, surrounded by the Latin text 'ACADEMIA • LUGDUNO • BATAVA • LIBERTATIS • PRAESIDIUM' and the year '1575'.

Master Class

Academic Year 2013-14



Introduction - Organizational

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Purpose

- 2nd year Master CS – 60 EC (= 1680 hours)
- Research Project (18 EC = 504 h)
- Master Thesis Project (42 EC = 1176 h)
- Goals of Master Class:
 - Present project and thesis topics
 - Stimulate interaction between students
 - Discuss open questions / issues
 - Exchange of information on important aspects
 - Support you during master projects phase



Presentations

- About Master Thesis
- One presentation in the beginning:
 - Research topic / question
 - Plans for approaching it
 - Open issues
 - ...
- One in the end:
 - Results
 - Exercising your defense presentation



Other Important Topics

- Scientific Article about Thesis
 - How to write it
 - Outline, requirements, plans for submission, ...
 - What makes your work publishable?
- Thesis Outline
 - Guidelines, table of contents, good examples
- Thesis evaluation criteria



RESEARCH PROJECT



Research Project

- 18 EC = 504 h = 12,6 wks (3 months)
- Currently one supervisor (future: two)
- Topics e.g.:
 - Literature study, review
 - Programming project, with a scientific goal, e.g.:
 - Implement new algorithm
 - Test an algorithm modification
 - Theoretical project, with a scientific goal, e.g.:
 - Prove a theorem
 - Runtime analysis of a new algorithm
 - Practical project, e.g., collaboration with company
 - Solve/work on a problem of practical relevance



Research Project – Formalities

- 2 supervisors – LIACS staff member
- Evaluation form for grading
 - Modified version of Master Thesis form
- Company (if involved): advisory role only

Evaluation Form

- Fixed criteria
- Includes all aspects
- Weight of grades up to supervisor
- Needs both supervisor's signatures
- 2 supervisors from LIACS
- Company (if any): only advisory role

LIACS Project Assessment Form

This form is to be used to support the final assessment of Research Projects at LIACS (including Computer Science, ICT in Business, Media technology). After signing this form, the 1st supervisor can hand it in to the coordinator of the program that the student followed as an official proof of the grade of the project work.

Student Name		<input type="checkbox"/> CS <input type="checkbox"/> ICTIB <input type="checkbox"/> MediaTech	
Project Name		Number of EC's	18
First Supervisor			
Second Supervisor			
Other assessors			

Category	Arguments in favour and against (pro's and con's)	Grade
Project Work	(including software, paper)	
Publications that came out of the project (if any)	Please mention authors, title, conference/journal and whether the paper has been accepted	
Project Execution		
Other items delivered (poster, exhibit, ...)		
Overall grade	Grades can be 'halves' except for 5.5.	
Signature 1st supervisor	Signature 2nd supervisor	date

Criteria that are used to quantify the result:

- **Quality of the project work**
 - o Amount of literature processed/read/used in the report
 - o Innovative character of the work, if any
 - o Quality of the reporting (structure of the report, grammar)
 - o Critical thinking: the student does not take presented information for granted, but challenges this
 - o Contribution to scientific knowledge
 - o Other (presentations, publications, ...)
- **Characteristics of executing the project**
 - o The student has made a good planning and largely stuck to this planning
 - o Autonomy (self-propelling): student has performed the work largely autonomously with little input required from the supervisors
 - o Systematic application of methods and techniques

A guideline for the relative weights of the categories for grading is: Project work 70%, Project execution 20%, Other items delivered: 10%.



MASTER THESIS



Master Thesis

- Ideally:
 - A unique piece of research
 - Advancing the field
- Not just repeating/implementing something
- Based on state-of-the-art in your area of research
- Bring in you own creativity
- Extend existing approaches, invent new ones
- Compare with state-of-the-art



Thesis Examples

- Look at <http://www.liacs.nl/edu/mastercs/masterscripties/>
- Let's inspect a few
- Take one for you as a guideline – choose your own.



A theoretical thesis will be different. This is only a very rough outline. Look at examples at <http://www.liacs.nl/edu/master-cs/masterscripties/>

1. Front Page: <http://www.liacs.nl/edu/master-cs/documenten/>

Get your LIACS Internal Report number from Marloes van der Nat, room

2. Introduction

About the task, brief intro to the field, ...

3. Problem Statement

Could also be included into 1. A detailed description of the task.

4. Existing Work/Algorithms

What did others do? What are the algorithms/techniques you need for this? What are the potential bottlenecks, or issues with these algorithms? Why do we need / want to improve /change them?

4. New Development

The new stuff: New algorithmic extensions, developments, etc.

5. Experimental Results

How the new algorithm performs. Sound experimental evaluation.

6. Conclusions

What did we learn? What should be done beyond this thesis?

6. Appendices (Algorithms, Results, Proofs, ...)

7. References

Evaluation Form

- Fixed criteria
- Includes all aspects
- Weight of grades up to supervisor
- Needs both supervisor's signatures
- 2 supervisors from LIACS
- Company (if any): only advisory role

LIACS M.Sc. Project Assessment Form

This form can be used to support the final assessment of M.Sc. projects at LIACS (including Computer Science, ICT in Business, Media technology). After signing this form, the 1st supervisor can hand it in to the coordinator of the program that the student followed as an official proof of the grade of the project work.

Student Name		<input type="checkbox"/> CS <input type="checkbox"/> ICTIB <input type="checkbox"/> MediaTech
Project Name		Number of EC's
First Supervisor		
Second Supervisor		
Other assessors		

Category	Arguments in favour and against (pro's and con's)	Grade
Thesis Work	(including software, paper)	
Publications that came out of the project (if any)	Please mention authors, title, conference/journal and whether the paper has been accepted	
Project Execution		
Final Presentation		
Defense		
Other items delivered (poster, exhibit, ...)		
Overall grade	Grades can be 'halves' except for 5.5.	
Signature 1 st supervisor	Signature 2 nd supervisor	date

Criteria that are used to quantify the result:

- Quality of the thesis
 - o Originality of the research question
 - o Creativity in creating a solution
 - o Soundness of the approach
 - o Quality of the reporting (structure of the thesis, grammar)
 - o Critical Thinking: the student does not take presented information for granted, but challenges this.
 - o Contribution to scientific knowledge (Has a publication been realized?)
- Characteristics of executing the project
 - o The student has made a good planning and largely stuck to this planning
 - o Autonomy (self-propelling): student has performed the work largely autonomously with little input required from the supervisors
 - o Systematic application of methods and techniques

A guideline for the relative weights of the categories for grading is: Thesis work 50%, Project execution 20%, Final



Risk Management

- What can go wrong?
- Risk analysis:
 - Risk identification - listing all hazards which could affect project
 - Risk estimation - likelihood and severeness of hazards
 - Risk evaluation - ranking and determination of risk aversion strategies



PLANNING YOUR 2ND YEAR



Important Planning Issues

- Select your target graduation ceremony date t
- At least $t - 3$ weeks: Grades complete
 - All examination results handed in to Mrs. B. ten Hove at educatief centrum
 - This includes Master Thesis result, so grades need to be with her!
- At least $t - 5$ weeks: Apply
 - Apply at the educatief centrum (graduate school office)
 - Statement from studie advisor or R. Derogee
 - Bachelor's degree certificate
 - Proof of admission to master's program
 - Copy of your passport/ID if your former education was not at the faculty of science, Leiden.
 - Proof of registration at university (collegekaart)
 - 2 hard copies + electronic version of your thesis to Marloes vd Nat, room 155
 - Front page of thesis
 - Before this:
 - Get in touch with Riet Derogee or Jeannette de Graaf
 - Receive statement from them



Important Planning Issues

- Master thesis grade
 - Requires oral presentation, open to staff at LIACS
 - Coordinate presentation date with your supervisors
 - Should be sufficiently in time (at least $t - 5$ weeks)
 - Grades should be announced to you after that presentation
 - Grading guidelines (9 and above only with (foreseeable) publication)
- Second supervisor
 - Find one early enough! Let your first supervisor help you
 - Role: Reads the thesis, helpful comments, assists in grading
 - Make sure (s)he knows what you are doing and reads the thesis, so is readily available to assess your thesis



Important Planning Issues

- Dates: $t - 5$ wks $t - 35$ wks
 - 27.09.2013
 - 29.11.2013
 - 28.03.2014
 - 27.06.2014 23.05.2014 25.10.2013
 - 26.09.2014 22.08.2014 25.01.2014
- Oral presentation/defense: around that time ($t - 5$).
- 42 EC = 1176 h = 29.4 weeks @ 40h = 7.5 months
- Add some vacation etc.



WRITING A SCIENTIFIC PAPER



Writing a scientific paper

- Guidelines (style sheets)
- Results ready?
 - Experimental
 - Theoretical
 - Survey
 - Combination



Writing a scientific paper

- Paper structure?
 - Title and Authors
 - Abstract
 - Introduction
 - What is the problem
 - State of research
 - Algorithm / Approach / New Stuff
 - Experimental Results
 - On application problem?
 - On sample data?
 - On real-world problem?
 - On real-world data?



Writing a scientific paper

- Comparison
 - To other stuff / existing work
- Conclusions, Outlook
- References



Submitting it

- Journal / Conference?
- Submission deadline / no deadline?
- Review process?
 - 3-5 reviews, sometimes less
- Preparing final version (submission deadline)
- Assignment of rights
- Publication
- (Conference presentation)



SCHEDULE, TOPICS



Schedule MasterClass

Date	Topics
04.09.2013	Welcome, Introduction to Master Class
18.09.2013	Scientific Practice
09.10.2013	External guest speaker
16.10.2013	Alumni of LIACS
06.11.2013	Master Student Presentations
13.11.2013	Sociopolitical Aspects of Computer Science – a Discussion
20.11.2013	Master Student Presentations
04.12.2013	Wrap-Up

- More meetings will be scheduled if required!