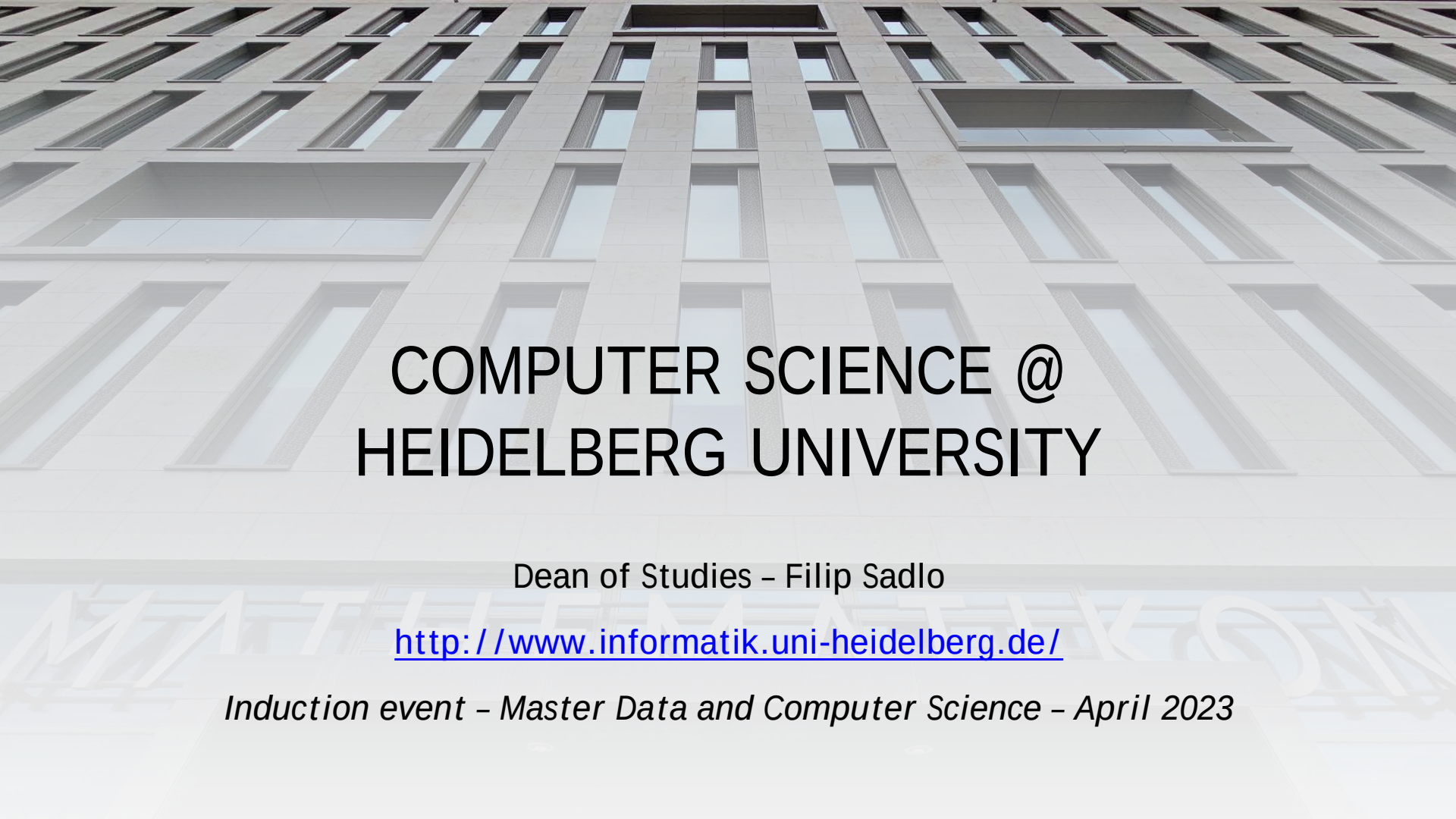


COMPUTER SCIENCE @ HEIDELBERG UNIVERSITY

Dean of Studies – Filip Sadlo

http://www.informatik.uni-heidelberg.de/

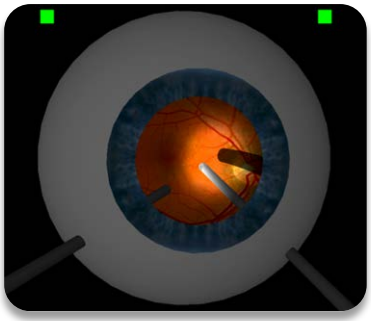
Induction event – Master Data and Computer Science – April 2023

Heidelberg University

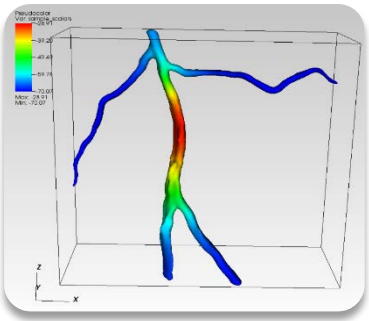
- Since 1386 – oldest university in Germany
- Approx. 30k students
- Approx. 500 professors (incl. medicine)
- 57 Nobel Prizes
- Since 2007 one of the German Universities of Excellence

commons.wikimedia.org

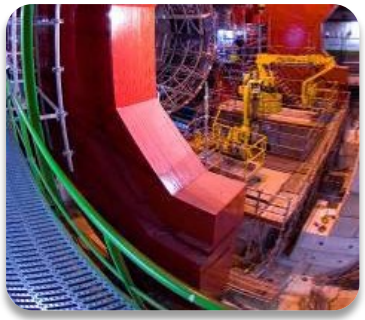
MAIN RESEARCH AREAS AT HEIDELBERG UNIVERSITY



Medicine



Biology

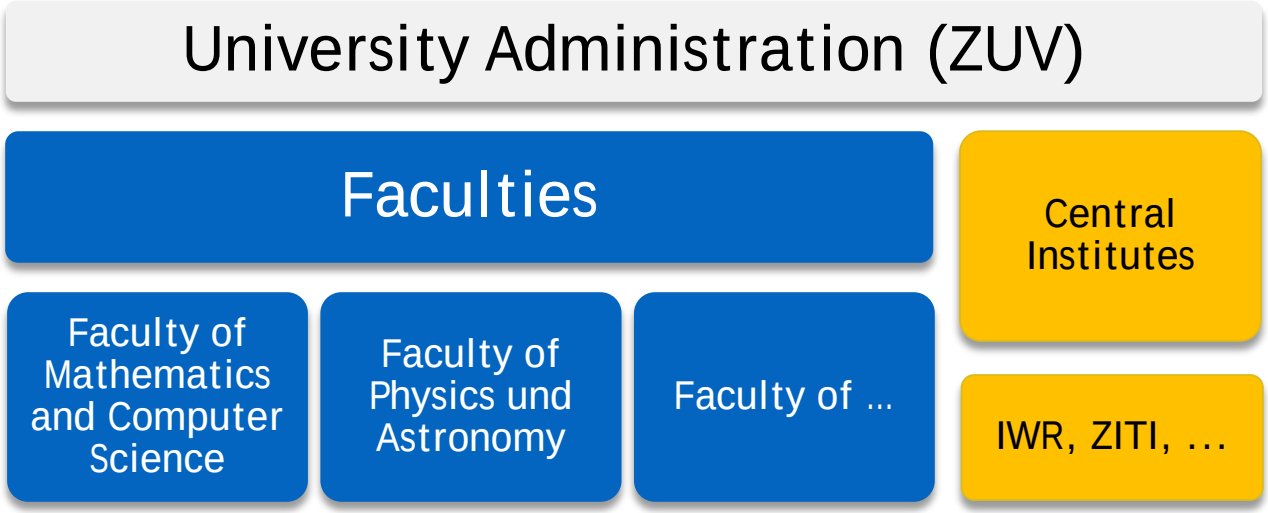


Physics

Astronomy

… as well as many other natural sciences and humanities!

STRUCTURE OF THE UNIVERSITY (SIMPLIFIED)



Faculties combine sciences into administrative units and may consist of institutes

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Our faculty consists of three institutes

- Institute for Computer Science (IfI): teaching and research mainly in applied computer science (www.informatik.uni-heidelberg.de)
- Mathematical Institute • Institute for Applied Mathematics: include mathematics education of computer science students

Other participating centers/institutes

- Interdisciplinary Center for Scientific Computing (IWR) (interdisciplinary, many contributing faculties) (www.iwr.uni-heidelberg.de)
- Institute for Computer Engineering (ZITI) (jointly with Faculty for Engineering Sciences) (www.ziti.uni-heidelberg.de)

Teaching: all are involved (to varying extent)

Research: see www.informatik.uni-heidelberg.de/forschung.html

INSTITUTE OF COMPUTER SCIENCE (IFI)

ESTABLISHED IN 2001, COVERS CORE OF COMPUTER SCIENCE, INF 205

Core

Artur Andrzejak:
Parallel & Distributed Systems

Michael Gertz:
Database Systems

Felix Joos:
Theoretical Computer Science

Barbara Paech:
Software Engineering

Christian Schulz:
Algorithm Engineering

Associated

Peter Bastian:
Scientific Computing

Klaus Maier-Hein:
Medical Imaging Computing

Lena Maier-Hein:
Computer Assisted Medical Interventions

Stefan Riezler:
Statistical Natural Language Processing

Filip Sadlo:
Visual Computing

INTERDISCIPLINARY CENTER FOR SCIENTIFIC COMPUTING (IWR)

Research (and teaching) in mathematics and applied computer science

- Mathematical modeling • simulation • optimization • computer vision • visualization

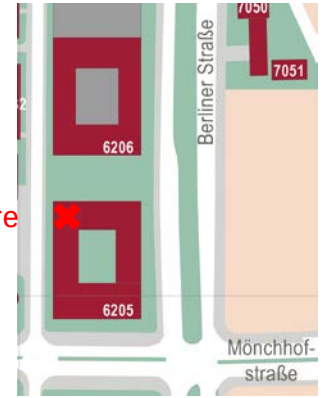
Applications in physics, biology, archaeology, …

Approx. 50 members

Mathematikon, INF 205, partly in part B

IWR
Interdisciplinary Center for Scientific Computing

You are here



6205 Mathematikon Bauteil A
6206 Mathematikon Bauteil B

INSTITUTE OF COMPUTER ENGINEERING (ZITI)

Teaching and research in the areas of computer engineering

• Computer architecture • robotics • medical technology • application specific computers • circuitry and simulation • computing systems

In building INF 368

Robert Strzodka
Application Specific Computing

Peter Fischer
Circuit Design

Holger Fröning
Computing Systems

Lorenzo Masia
Biomedical Engineering & Biorobotics

Dirk Koch
Novel Computing Technologies

Alexander Schubert
Optimization, Robotics & Biomechanics

Nima TaheriNejad
Computer Architecture

PRACTICALITIES: GUIDANCE

Course guidance

Priv.-Doz. Dr. W. Merkle (merkle@math.uni-heidelberg.de)

Examination matters bachelor/master

Prof. Dr. Michael Gertz (gertz@informatik.uni-heidelberg.de)

Examination matters bachelor 50% with LA-Option/teaching profession/Lehramt

Prof. Dr. Barbara Paech (paech@informatik.uni-heidelberg.de)

Examination office

Anke Sopka (sekretariat@informatik.uni-heidelberg.de)

PRACTICALITIES: MAILING LISTS

Informatik-Erstifragen

Informatik-BSC

Informatik-MSC

Informatik-LA

Informatik-M-Edu

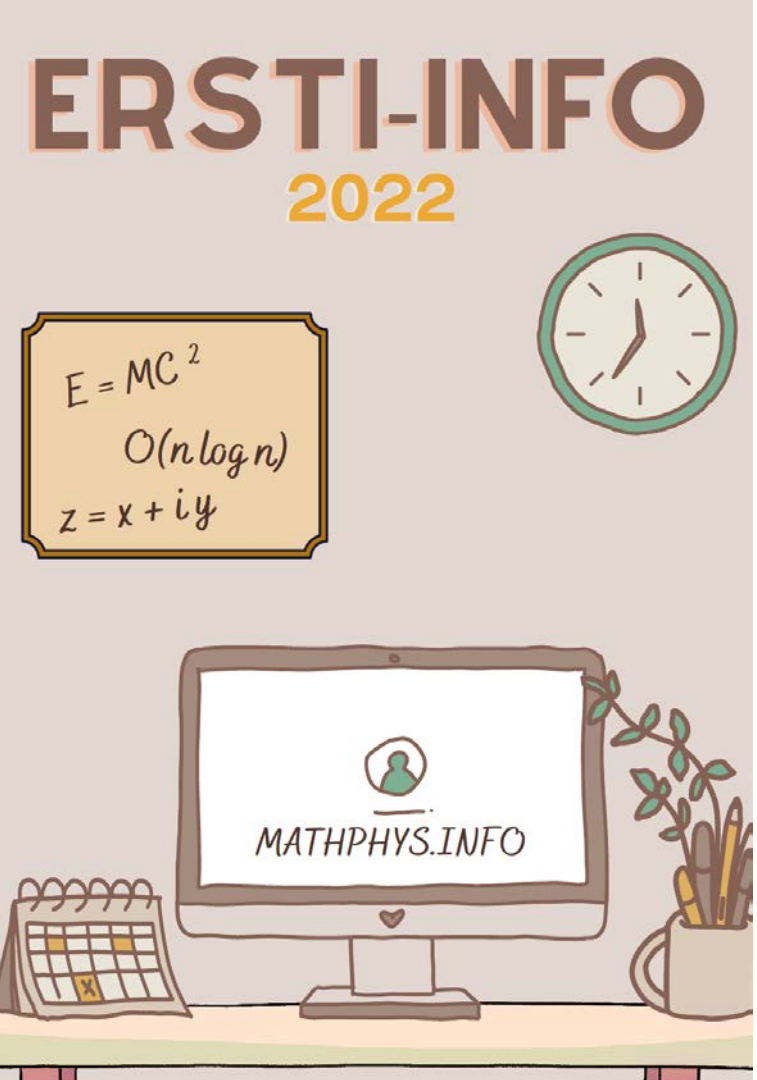
Inf-Weiterstud

Inf-Stellen

Inf-Externes

Automagically enrolled in the first five lists

www.informatik.uni-heidelberg.de/mailing



FACHSCHAFT MATHPHYSINFO

(STUDENT ASSOCIATION)

μφι Fachschaft MathPhysInfo

Representation of students in committees
Organization of socializing events
Passing on experiential knowledge
Information for freshmen: Ersti-Info (pdf)

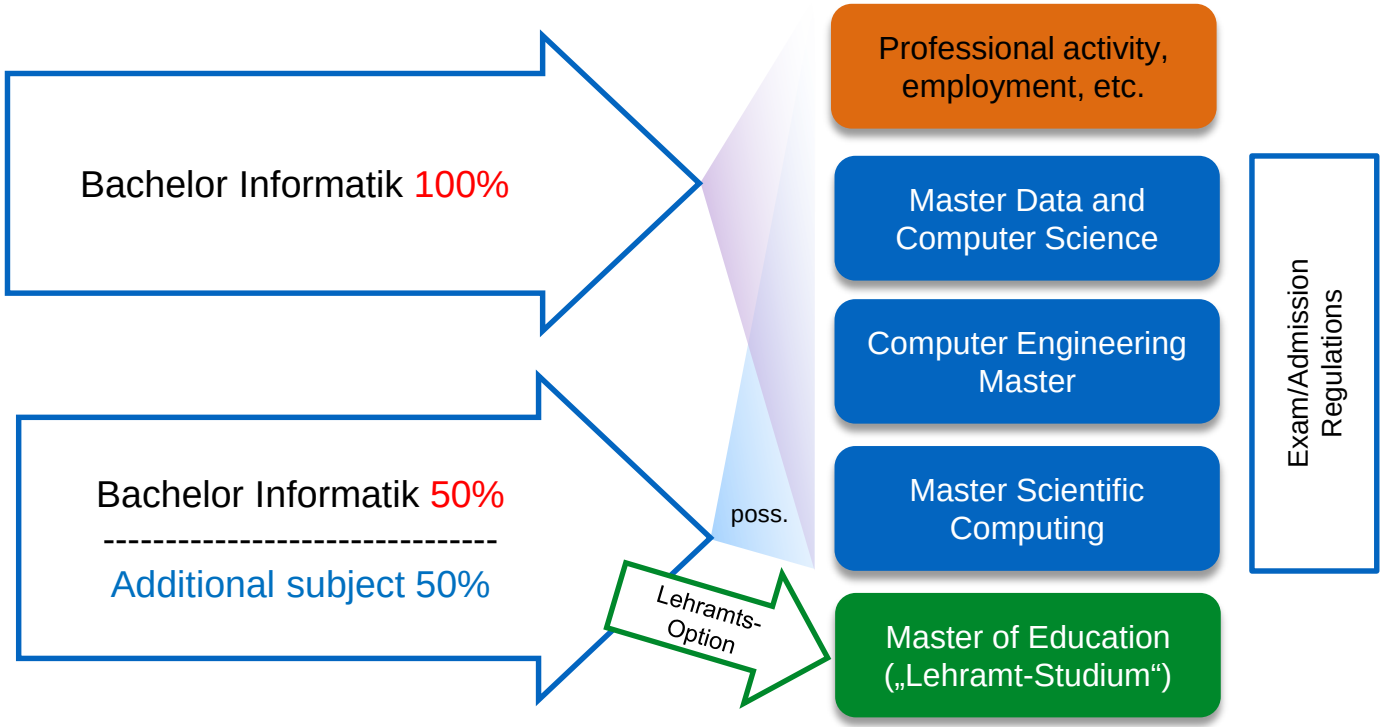
Game night: Thursday, April 20, 2023,
18:30 pm, SR A+B+C, INF 205
https://forms.gle/cCfYeM3332ud3XDz7

https://mathphys.stura.uni-heidelberg.de/w/en/events-for-newcomers/

Web: https://mathphys.info
Mail: fachschaft@mathphys.info
Discord: https://discord.mathphys.info

Weekly student council meeting: Wednesday 6:00 pm,
seminar room A+B, Mathematikon (INF 205)

OVERVIEW OF THE STUDY PROGRAMS IN COMPUTER SCIENCE



MASTER
DATA AND COMPUTER SCIENCE
(MSCDACS)

www.informatik.uni-heidelberg.de/studium/master/dacs

STRUCTURE OF THE MASTER

Duration: 3 semesters lectures, 1 semester master thesis

Total of 120 CP

62 CP in computer science

Compulsory modules: • Master Advanced Seminar (4 CP) • Master Advanced Practical (8 CP)

Elective modules (50 CP)

18 CP in application field

6 CP interdisciplinary skills (ÜK)

30 CP for master thesis

4 CP for master colloquium

ELECTIVE MODULES & SUBJECT AREAS

Required to cover 3 subject areas of the following list, each with at least 6 CP

- Visual Computing (VC)
- Software Systems and Engineering (SE)
- Scientific Computing (SC)
- Algorithmic Data Analysis and Machine Learning (AM)
- Algorithmics and Theoretical Computer Science (AT)
- Computer Engineering (CE)

Module	VC	SE	SC	AM	AT	CE
3D Computer Vision (I3dCVi)	•					
Advanced Machine Learning (IAML)				•		
Algorithm Engineering (IAE)					•	
Articial Intelligence for Programming (IAIP)				•		
Complex Network Analysis (ICNA)					•	
Computational Geometry (ICGeo)	•					
Computerspiele (ICS)	•					
Convex Optimization			•			
Discrete Structures 2 (IDS2)					•	
Fundamentals of Machine Learning (IFML)				•		
Geometric Modeling and Animation (IGMA)	•					
Hardware Aware Scientic Computing (IHASC)			•			
IT Project Management (IPM)		•				
Inverse Probleme (IIP)			•			
Machine Learning (IML)				•		
Mining Massive Datasets (IMMD)				•		
Numerische Optimierung			•			
Optimization for Machine Learning (IOML)			•			
Praktische Geometrie (IPGeo)	•					
Scientic Visualization (ISV)	•					
Software Evolution (ISWEvol)		•				
Software Ökonomie (ISWÖk)		•				
Volume Visualization (IVV)	•					
Knowledge Management and Decision-Making in Software Engineering (ISWKM)		•				
All basic & advanced modules of the MSc Computer Engineering (MScTI)						•

APPLICATION FIELD

Recommended: application field of the master continues the application field of the bachelor (exceptions of course possible)

- Astronomy • life sciences • chemistry • computational linguistics • geography
- earth sciences • mathematics • philosophy • physics • economics

All application fields of the bachelor program Informatik are allowed

Further application fields are possible on application (→ examination board)

New regulation: computer science eligible as application field (→ examination board)

Optional: implementation of an interdisciplinary project

In consultation with one lecturer each from computer science and application area

www.informatik.uni-heidelberg.de/studium/master/application_fields

SPECIALIZATIONS

Specialization = proposal of a combination of modules

- Visual Computing
- Information Systems Engineering
- Scientific Computing
- Algorithms and Theoretical Computer Science

More details in the module handbook and at

- www.informatik.uni-heidelberg.de/studium/master/dacs

Example “Information Systems Engineering”

- Focuses on database systems and software engineering
- Capability of developing, operating, and maintaining large-scale information systems

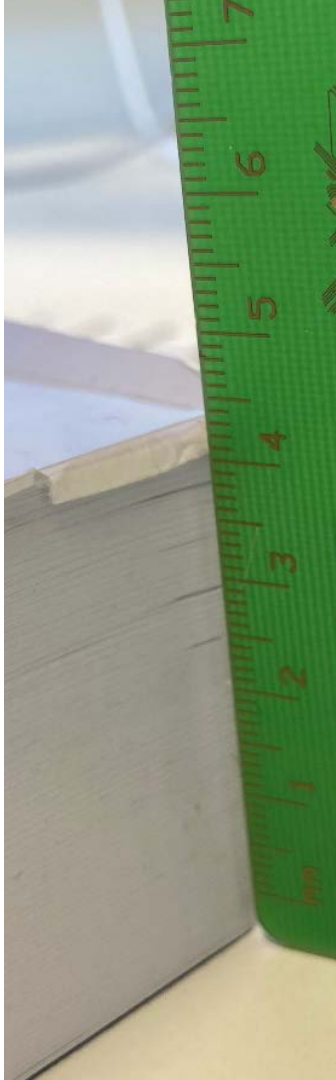
MASTER THESIS

Goal: Work independently on problems in computer science according to scientific methods

- Recommended in the 4th semester (30 CP)
- Should be prepared by the modules of the first 3 semesters
- Deepening the work at a research group by attending lectures, advanced practical course, seminars

In principle possible in industry, but in practice only if there is close cooperation between chair and industry

- Caution: Not solely a “programming project”
- Formal advising and grading by a lecturer of computer science is required
- Please contact at an early stage of your preparations the examination office or the chairman of the examination board



CLOSING REMARKS

NETWORK!

COMMUNITY

Campus-eigenes **O**nline-Tool auf **M**oodle: **M**itmachen und **u**nterstützen, **n**etzwerken, **i**nformieren, **t**reffen – **y**ou!

Different fora:

- Kick-off
- Learning together
- Master challenges together
- Share experiences
- Shape common recreation
- Materials exchange
- Lost and found

To COMMUNITY:

https://moodle.uni-heidelberg.de/course/view.php?id=13456

QUALITY MANAGEMENT & TEACHING EVALUATIONS

Online evaluation usually at mid term

Important feedback for the lecturer and the Studies Committee

Usually discussed at the end of term (lecturer and students)

He who asks a question is a fool for five minutes;
he who does not ask a question remains a fool forever.
– Chinese Proverb

Slides online:

www.informatik.uni-heidelberg.de/events