M.Sc. degree programmes @ UR

Computer Science
Data Science
Human-Centred AI

April 29th, 2025

Prof. Florian Erhard | **Fakultät für Informatik und Data Science**

Universität Regensburg

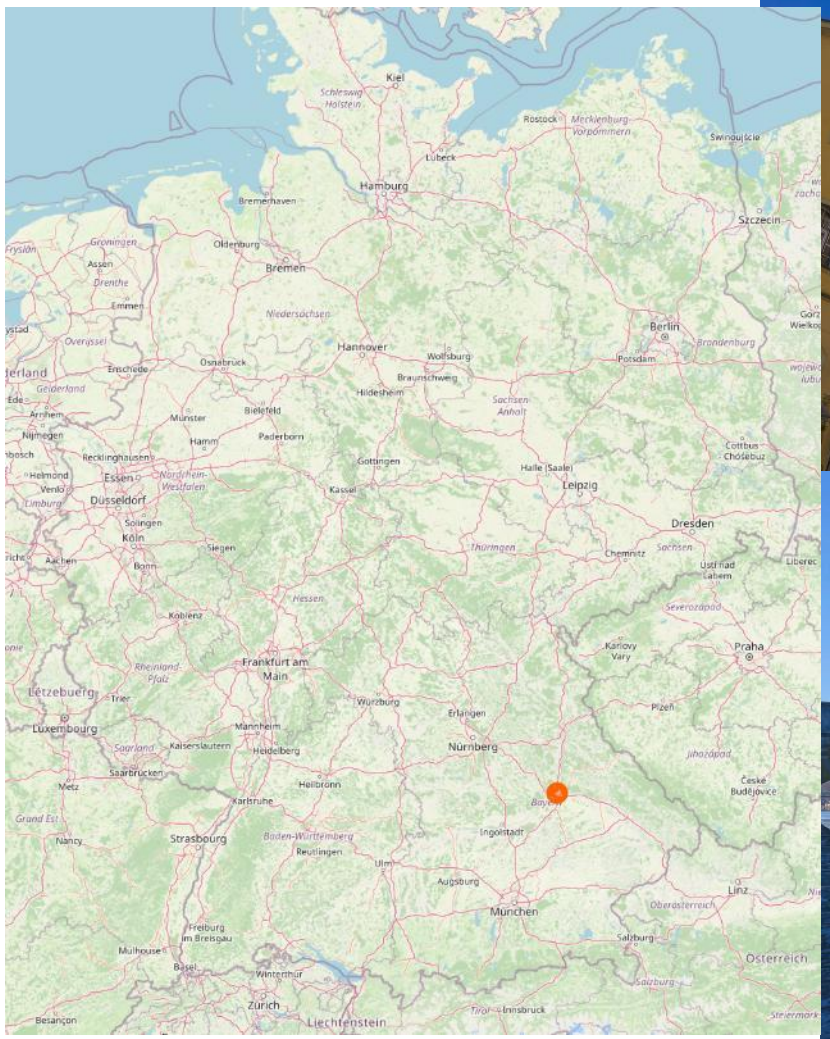
Agenda

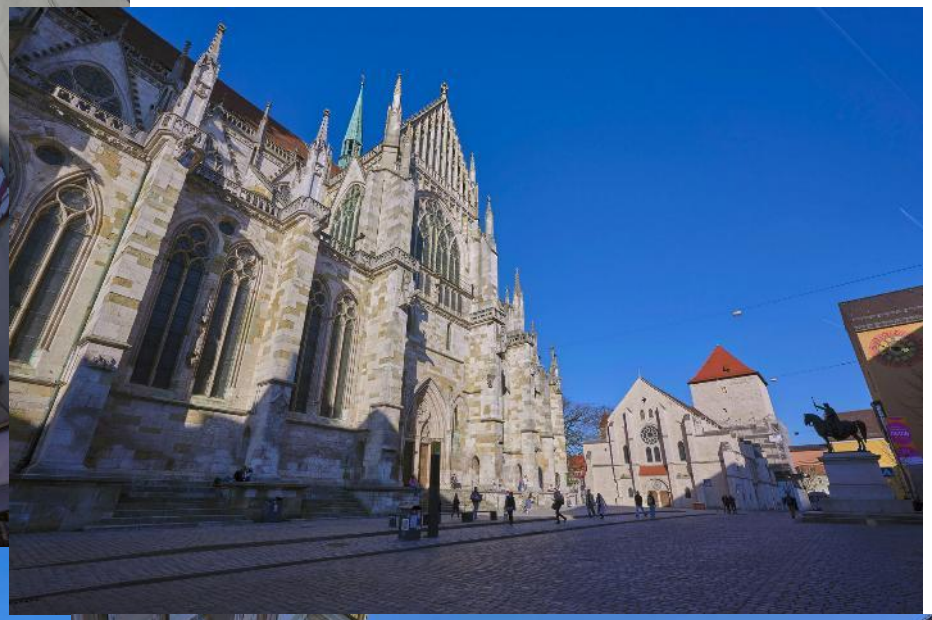
16:15 – 16:25	**Introduction**
16:25 – 16:35	**M.Sc. Computer Science (+ aptitude assessment process)**
16:35 – 16:40	**M.Sc. Data Science**
16:40 – 16:45	**M.Sc. Human-Centred AI**
16:45 –	**Q&A**

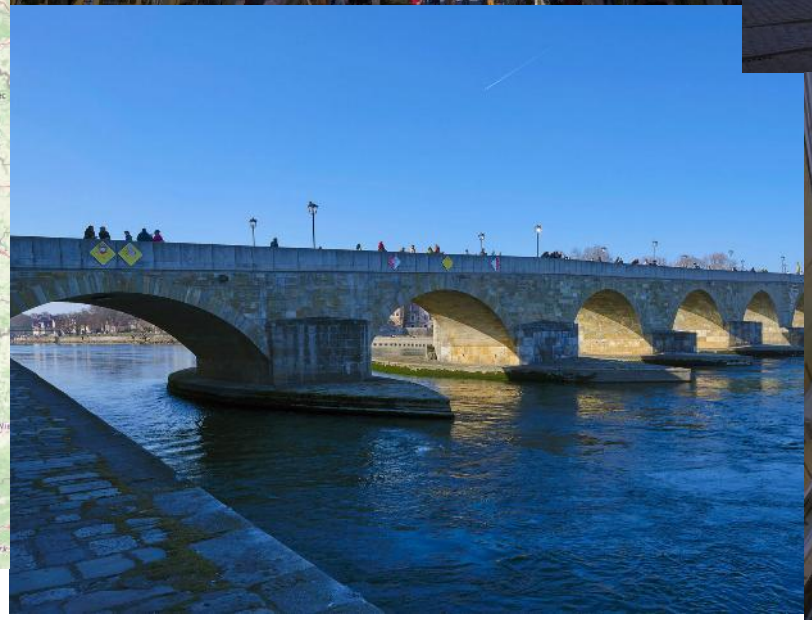
Introduction

Where we are

Fotos: UR, M Meilinger



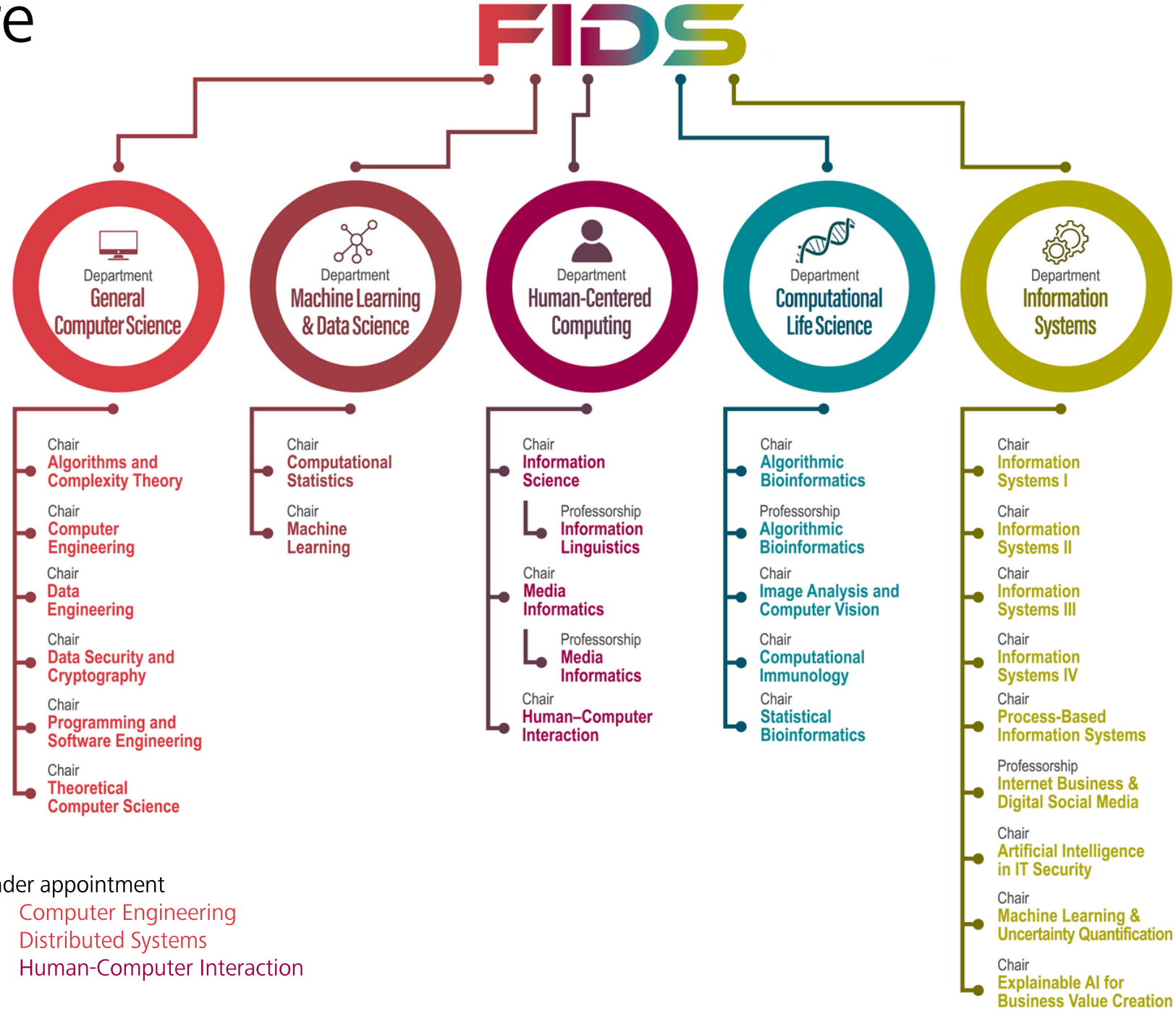




The University of Regensburg

Fotos: UR, M Meilinger / A Schuppe / F Erhard

Who we are



Under appointment

- Computer Engineering
- Distributed Systems
- Human-Computer Interaction

A brief history of the FIDS

Foto: UR | J Dragan

March 6th, 2020
The University of Regensburg proudly announces the establishment of a new faculty: The FIDS.

2020 2021 2022 2023 2024 2025

A brief history of the FIDS

Foto: UR | B Schmidt

March 6th, 2020
The University of Regensburg proudly announces the establishment of a new faculty: The FIDS.

Oct 16th, 2023
Here we go – welcoming the first students at FIDS!

2020 2021 2022 2023 2024 2025

A brief history of the FIDS

Foto: UR | F Erhard

March 6th, 2020
The University of Regensburg proudly announces the establishment of a new faculty: The FIDS.

Oct 16th, 2023
Here we go – welcoming the first students at FIDS!

April 15th, 2024
Our new building is ready for classes.

2020 2021 2022 2023 2024 2025

Degree programmes @ FIDS

starting WS25/26

B.Sc. Informatik		**M.Sc. Computer Science**
B.Sc. Data Science		**M.Sc. Data Science**
		M.Sc. Human-Centred AI
B.Sc. Wirtschaftsinformatik	since WS24/25 @ FIDS	**M.Sc. Wirtschaftsinformatik**

Overview
The Masters Programme in Computer Science

Philipp Rümmer| **Faculty of Informatics and Data Science**

Universität Regensburg

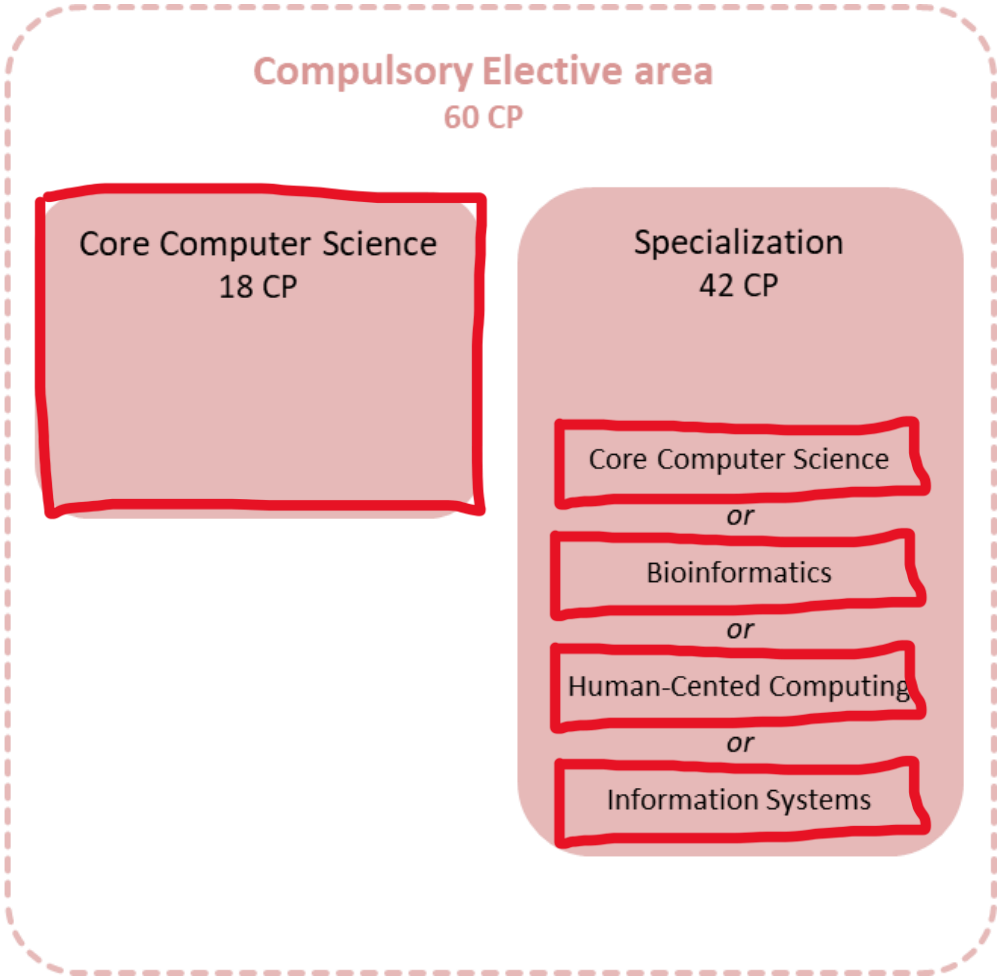
Our Goals

A modern second-cycle degree programme in Computer Science

- International
- Excellent coverage of core topics in Computer Science
- Flexible in every regard
- Room for specialisation, connections to:
  - Ongoing research
  - Applications
  - Other scientific disciplines

Overview

Examples of modules are
Advanced Explainable AI,
Social Network Analysis,
Digital Platforms and the AI Economy,
Security of mobile systems,
Multilateral Security: Anonymous Communication Systems,
IT Security Practice,
Process Mining,
Security of data-intensive applications
etc.



One Possible Study Plan

1st semester	2nd semester	3rd semester	4th semester
Advanced Algorithms	Advanced Software Engineering	Seminar	Masters thesis
Free Elective	Free Elective	Specialization	
Specialization	Specialization		
Core Computer Science	Specialization	Research project	
Core Computer Science	Core Computer Science		

Compulsory

Elective

Application and Admission

Entry requirements

- University degree (usually Bachelor) corresponding to ≥180 ECTS credits, including 78 credits in:
  - Theoretical CS (12)
  - Technical CS (12)
  - Applied CS (12)
  - Other CS (24)
  - Mathematics (18)
- GRE test
  - Exception: your university degree was done in a signatory state of the “Lisbon Convention”, which includes all EU countries
- English ≥B2
  - Exception: Bachelor thesis in English

How Can You Apply?

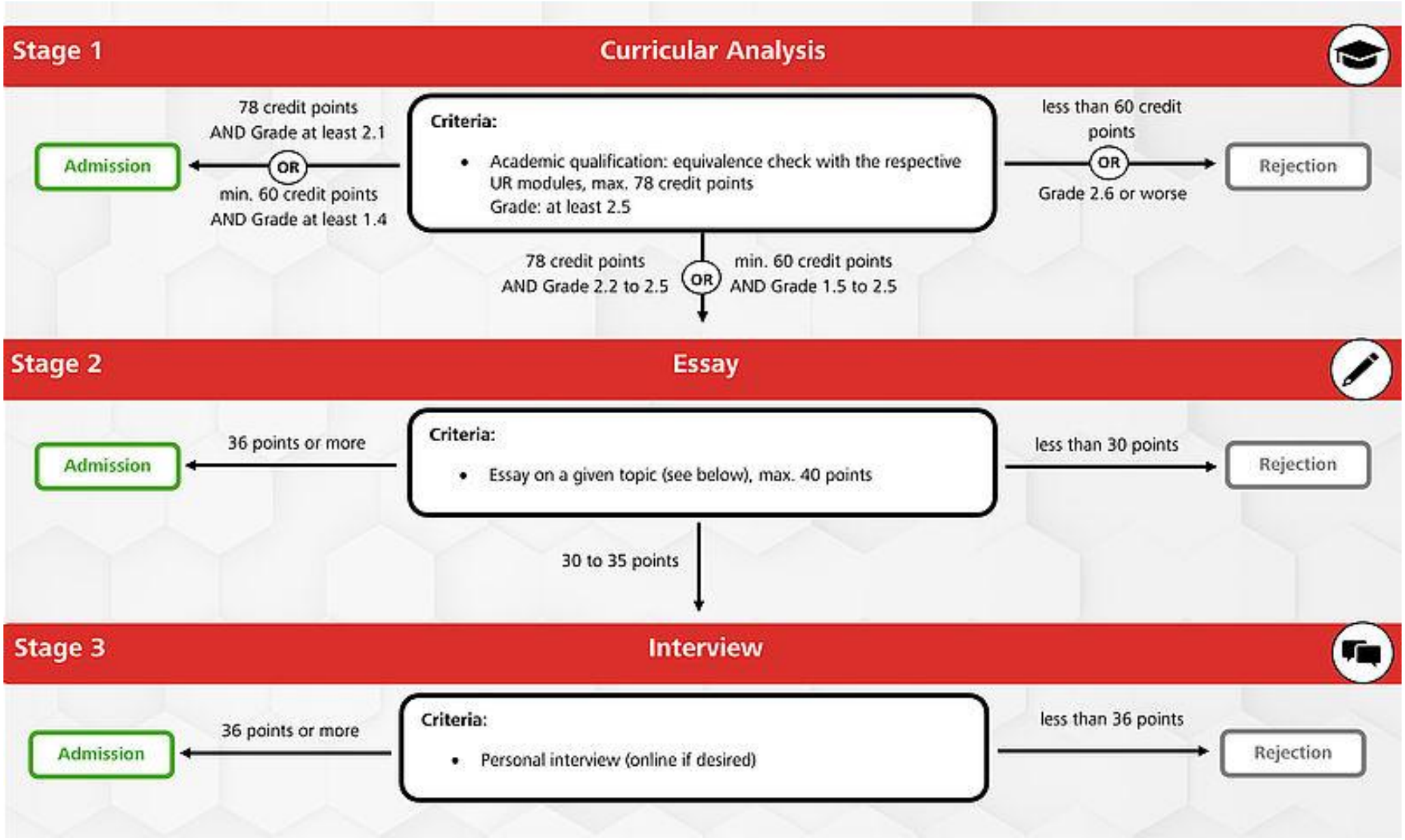
- Three different web portals are involved 😳
  - **Campus portal** of the University of Regensburg
  - **Uni-Assist**, which provides the "preliminary examination documentation"
  - **Curricular analysis** web form

- Application deadline for start in winter: June 1st
- Application deadline for start in summer: December 1st

More information

- https://www.uni-regensburg.de/informatics-data-science/faculty/study-at-fids/prospective-students/msc-computer-science/index.html

Aptitude Assessment Process



Degree programme
M.Sc. Data Science

Organization

Compulsory courses
42 credits

- Modern Machine Learning
- Seminar
- Master's Thesis

Compulsory elective courses
54 credits

Machine Learning and Statistics
12 CP

Specialization
42 CP

Machine Learning and Statistics

or

Computational Life Sciences

or

Human-Centred Data Science

or

Information Systems

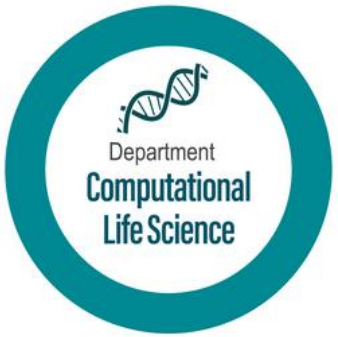
Elective courses
24 credits

Free Elective
(Data Science or Computer Science courses)

Studium Universale
(University courses)

Specializations

	Machine Learning and Statistics	Human-Centred Data Science	Computational Life Sciences	Information Systems
Compulsory:	36 LP	18 LP	30 LP	18 LP
Compulsory elective:	6 LP	24 LP	12 LP	24 LP



Specializations

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Compulsory:	36 LP	18 LP	30 LP	18 LP
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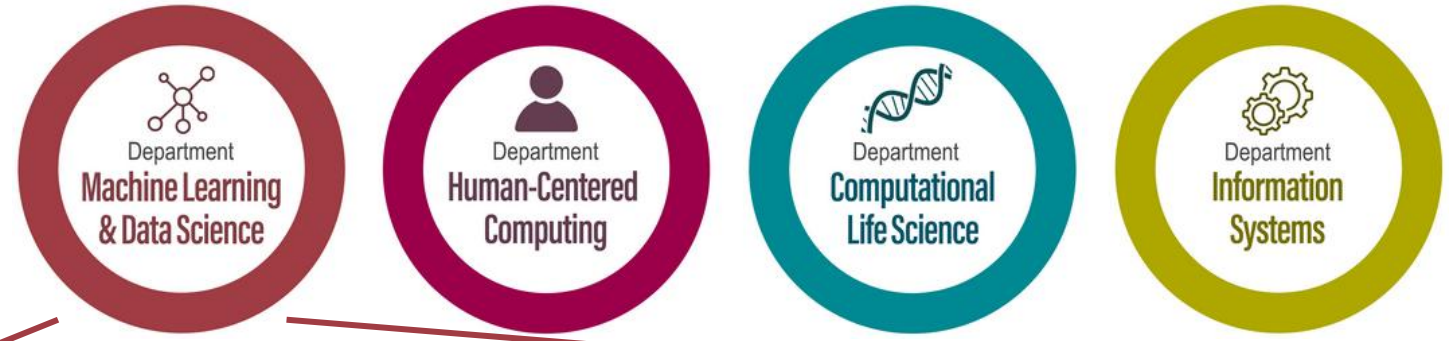


Compulsory:

- *Statistical Machine Learning*
- *Advanced Statistics I*
- *Research project in Machine Learning and Statistics*

Compulsory elective: Choose from

Advanced Statistics II, Lectures in Mathematics, Advanced explainable AI, Advanced Data Engineering, Digital Image Processing – AI based approaches, Neural Networks – An Application-oriented Introduction, Advanced Topics in Machine Learning and Statistics

Specializations

	Machine Learning and Statistics	Human-Centred Data Science	Computational Life Sciences	Information Systems
Compulsory:	36 LP	18 LP	30 LP	18 LP
Compulsory elective:	6 LP	24 LP	12 LP	24 LP

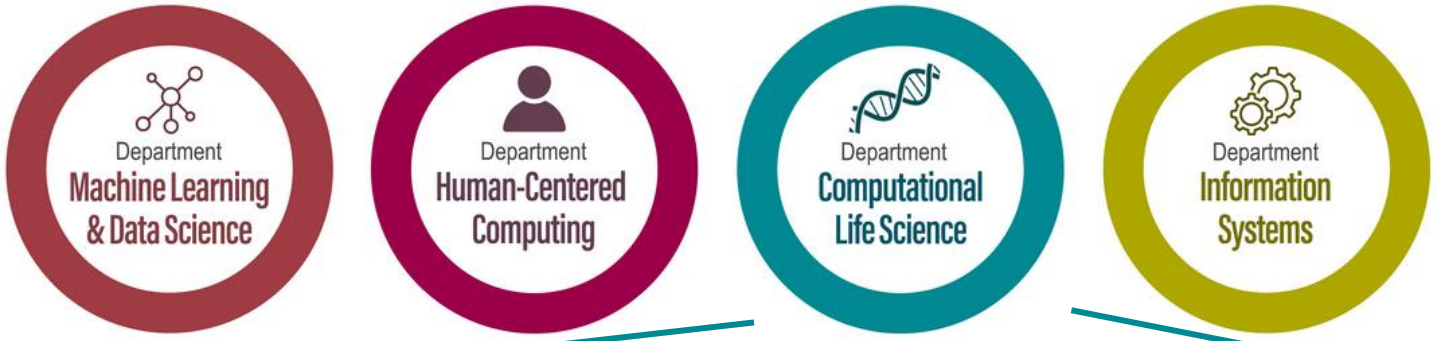
Compulsory:

- *Advanced Information Behaviour*
- *Deep Reinforcement Learning for Human Decision Strategies*

Compulsory elective: Choose from *Interaction Technologies I+II, Interaction Technologies II, Explainable AI for HCI, Generative AI for HCI, Current Topics in HCAI, Empirical HCAI, Computational HCAI Research Project in HCAI*

Specializations

	Machine Learning and Statistics	Human-Centred Data Science	Computational Life Sciences	Information Systems
Compulsory:	36 LP	18 LP	30 LP	18 LP
Compulsory elective:	6 LP	24 LP	12 LP	24 LP

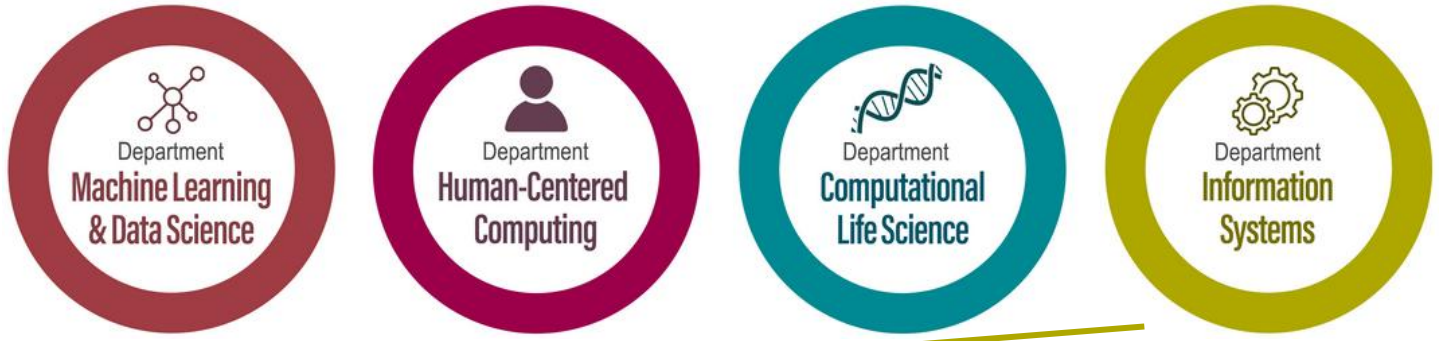


Compulsory:
- *Biology for Computer and Data Scientists*
- *Statistical Bioinformatics*
- *Research project in Bioinformatics*

Compulsory elective: Choose from *Algorithmic Bioinformatics, Analysis of High-dimensional Data, Optimization, Current Topics in Bioinformatics*

Specializations

	Machine Learning and Statistics	Human-Centred Data Science	Computational Life Sciences	Information Systems
Compulsory:	36 LP	18 LP	30 LP	18 LP
Compulsory elective:	6 LP	24 LP	12 LP	24 LP



Compulsory:
- *Advanced Explainable AI*
- *Advanced Seminar Information Systems*

Compulsory elective: Choose from
Neural networks, Security of data-intensive applications, Security of mobile systems, Multilateral Security, IT Security Practice, Social Network Analysis, Digital Platforms, Intelligent Agents and Reinforcement Learning, Business Engineering, Process Mining

Example of a study programme

1st semester	2nd semester	3rd semester	4th semester
Modern Machine Learning	Specialization	Free elective	
Specialization	Specialization	Seminar	
Specialization	Compulsory elective		Master's thesis
Compulsory elective	Free elective	Research project	
Free elective	Free elective		

Example of a study programme

1st semester	2nd semester	3rd semester	4th semester
Modern Machine Learning	Algorithmic Bioinformatics	Optimization	Master's thesis
Biology for Computer and Data Scientists	Analysis of high-dimensional data	Current Topics in Bioinformatics	
Statistical Bioinformatics	Advanced Statistics I	Research project in Bioinformatics	
Advanced Data Engineering	Digital Image Processing		
Biochemistry	Topics in Algorithms and Complexity Theory		

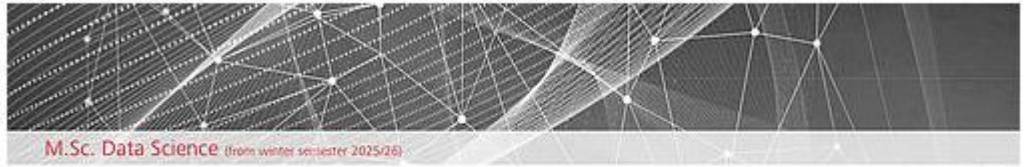
Example

Course of Study and Curriculum

Course of Studies

The course of studies of the M.Sc. in Data Science is highly flexible - however, we recommend a basic framework that you can use as a guide during your studies.

The following overview shows you which course of studies we generally recommend for full-time study in four semesters, regardless of which specialization you choose.



General study program

The following overview shows you which course of study we generally recommend for full-time study in four semesters.

1st semester	
18 ECTS	Compulsory area and compulsory elective area "Machine Learning and Statistics"
12 ECTS	Compulsory elective area "Specialization"
2nd semester	
18 ECTS	Compulsory area and compulsory elective area "Machine Learning and Statistics"
12 ECTS	Compulsory elective area "Specialization"
3rd semester	
12 ECTS	Compulsory area and compulsory elective area "Machine Learning and Statistics"
18 ECTS	Compulsory elective area "Specialization"
4th semester	
30 ECTS	Master's Thesis

M.Sc. Data Science | Study program | starting in winter semester | General study program

FIDS

Here we provide you with courses of study for our four specializations:

Start of full-time studies in winter semester

- Specialization: Machine Learning and Statistics
- Spezialitation: Computational Life Sciences
- Specialization: Human-Centred Data Science
- Specialization: Information Systems

1st semester

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4th semester

Master's thesis

See website for more example curricula!

Application and Admission

Admission process and requirements:

identical to M.Sc. Computer Science

The only difference:

- University degree (usually Bachelor) corresponding to ≥180 ECTS credits, including 54 credits in:
  - Data Science / Statistics / Machine learning (18)
  - Mathematics (18)
  - Programming (6)
  - Other DS (12)

Why data science in Regensburg

Why data science?

What used to be gold, nowadays is data!

Why data science in Regensburg?

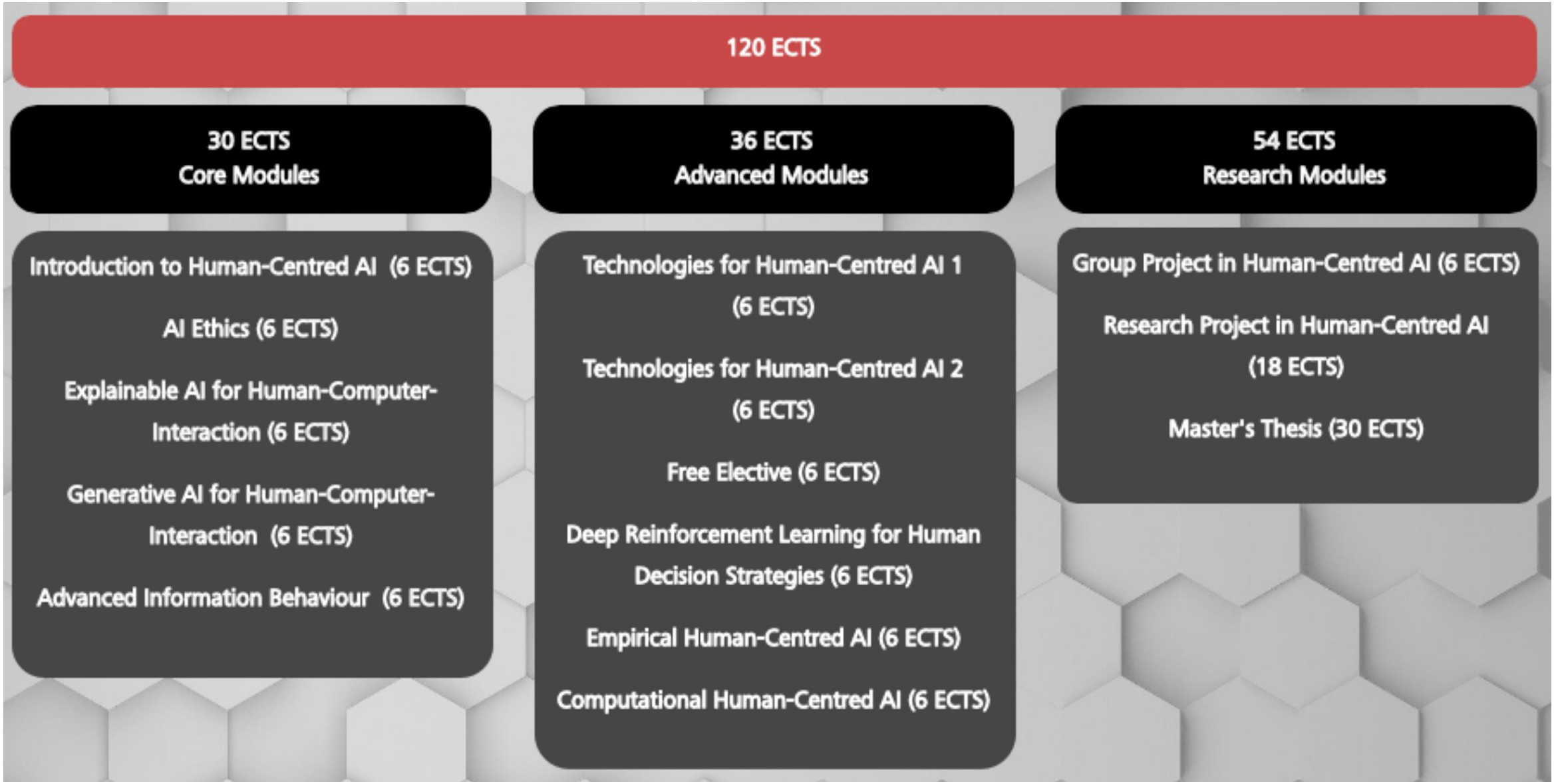
Our programme is fresh, modern, and future-focused, linking education in state-of-the-art data science methods with highly relevant application domains.

Overview
The Masters Programme in Human-Centred Artificial Intelligence

Udo Kruschwitz | **Faculty of Informatics and Data Science**

Universität Regensburg

Organization



Possible Study Plan

Module code	Module title	CP	
Winter semester: 1st semester			
HCAI-M01	Introduction to Human-Centred AI	6	30 CP
HCAI-M02	AI Ethics	6	
HCAI-M03	Technologies for Human-Centred AI	6	
HCAI-M04	Conversational Agents as Human Centered Interfaces	6	
HCAI-M05	Free Elective	6	
Summer semester: 2nd semester			
HCAI-M06	Explainable AI for Human-Computer-Interaction	6	30 CP
HCAI-M07	Generative AI for Human-Computer-Interaction	6	
HCAI-M08	Information Behaviour	6	
HCAI-M09	Deep Reinforcement Learning for Human Decision Strategies	6	
HCAI-M10	Current Topics in Human-Centred AI	6	
Winter semester: 3rd semester			
HCAI-M11	Empirical Human-Centred AI	6	30 CP
HCAI-M12	Computational Human-Centred AI	6	
HCAI-M13	Research Project in Human-Centred AI	18	
Summer semester: 4th semester			
HCAI-M-THESIS	Master's Thesis	30	30 CP Master's Thesis

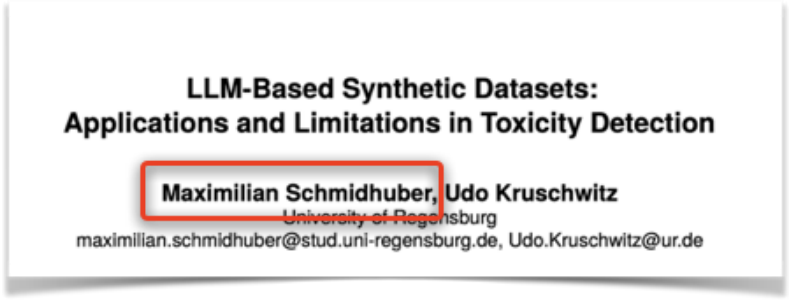
Application and Admission (key points)

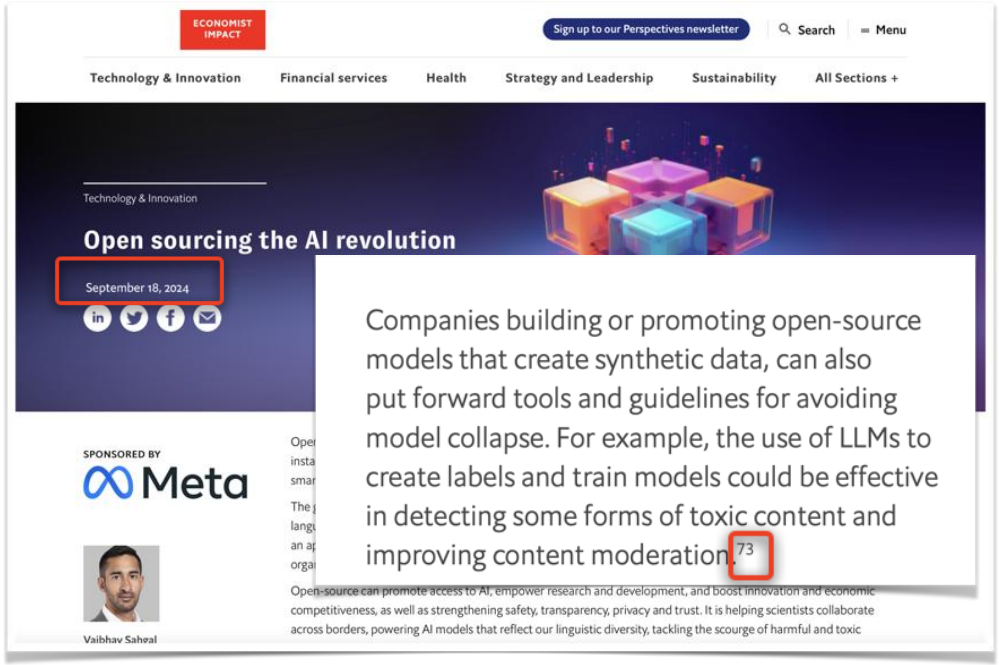
- **Empirical and statistical research** (12 ECTS are required), such as competencies in descriptive and inferential statistical methods
- **Natural language processing** and/or **information retrieval** (18 ECTS are required), such as knowledge about embeddings, text summarisation, and information extraction
- **Programming** (12 ECTS are required), such as competencies in databases, algorithms, and object-oriented programming
- **further courses in the field of Information Science, Data Science, Mathematics, Computer Science or its application fields** (12 ECTS are required), such as competencies in task models, machine learning methods, and linear algebra

A total of **54 ECTS** must be achieved for admission, i.e. the given number of ECTS must be achieved in all areas.

What to expect? Research-led Teaching!

Module code	Module title	CP	
Winter semester: 1st semester			
HCAI-M01	Introduction to Human-Centred AI	6	30 CP
HCAI-M02	AI Ethics	6	
HCAI-M03	Technologies for Human-Centred AI	6	
HCAI-M04	Conversational Agents as Human Centered Interfaces	6	
HCAI-M05	Free Elective	6	
Summer semester: 2nd semester			
HCAI-M06	Explainable AI for Human-Computer-Interaction	6	30 CP
HCAI-M07	Generative AI for Human-Computer-Interaction	6	
HCAI-M08	Information Behaviour	6	
HCAI-M09	Deep Reinforcement Learning for Human Decision Strategies	6	
HCAI-M10	Current Topics in Human-Centred AI	6	
Winter semester: 3rd semester			
HCAI-M11	Empirical Human-Centred AI	6	30 CP
HCAI-M12	Computational Human-Centred AI	6	
HCAI-M13	Research Project in Human-Centred AI	18	
Summer semester: 4th semester			
HCAI-M-THESIS	Master's Thesis	30	30 CP Master's Thesis





Q&A