ENVIRONMENT

Institute of Geodesy and Geoinformation

The Institute of Geodesy and Geoinformation focusses on using geodetic data for assessing climate change and monitoring the environment (including defining a global reference system), on land use management, property markets, urban planning, and ecosystem services assessment, and on developing sensor systems that aid precision agriculture and robotic systems research.

Institute of Computer Science

The Institute of Computer Science is a leading center for research and education in computer science. It offers a range of modern bachelor's programs and internationally recognized master's programs in English, while also contributing to interdisciplinary initiatives like the Lamarr Institute for Machine Learning and Artificial Intelligence and the PhenoRob Cluster of Excellence.

DFG Cluster of Excellence on Robotics and Phenotyping

PhenoRob performs world-leading research in robotics and phenotyping for sustainable crop production. Our vision is to transform crop production by optimizing breeding and farming management through developing and deploying new technologies. PhenoRob addresses a real-world problem with a technology-oriented approach. An interdisciplinary team forms the only DFG-funded Cluster of Excellence focusing on agriculture.

UNIVERSITÄT BONN

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UNIVERSITÄT BONN

Mobile Robotics

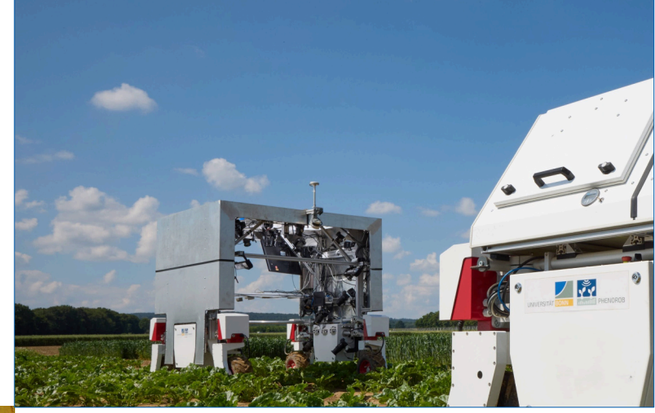
Faculty of Agricultural, Nutritional and Engineering Sciences
Faculty of Mathematics and Nature Science

Bachelor
Bachelor of Science (B.Sc)

Master
Master of Science (M.Sc.)

Staatsexamen | Kirchliche Examen

Lehramt

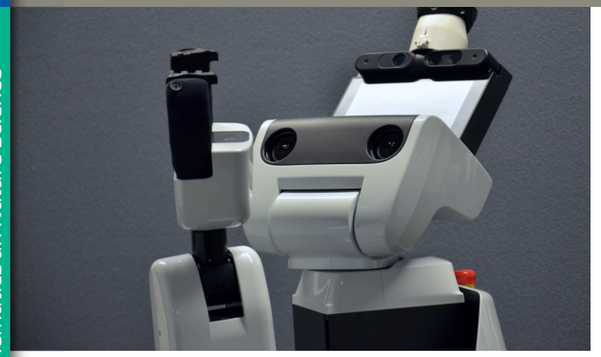


CENTER FOR ROBOTICS

The Center for Robotics stands for collaborative contributions to basic research and teaching in robotics at the University of Bonn, aiming to increase its inter-national visibility. It brings together the research groups and faculties working on robotics, especially in the fields of engineering and computer science, and supports developing joint research and training strategies. The Center's aim is to strengthen cutting-edge research on and with intelligent autonomous robots and educate students at the highest international level while also increasing the attractiveness of Bonn as a location. In addition, the Center supports networking activities with national and international partners and transfer activities. It also tightly links the robotics research activities that happen in the context of the Cluster of Excellence EXC 2070 "PhenoRob- Robotics and Phenotyping for Sustainable Crop Production" in the long term, streng-thening the Center's visibility in the robotics community.

Center for Robotics
www.robotics.uni-bonn.de

Degree	Study options	Standard period of study	Start of course
Master of Science (M.Sc.)	Major	4 Semesters	Winter Semester



Mobile Robotics

In the program, students learn the foundations to develop intelligent robots that can understand and model their surroundings, navigate the world, and act smartly. The study program is strongly research-oriented and aim at educating the newest generation of top talents in robotics. It focuses on probabilistic and learning techniques enabling mobile robots to operate reliably in the real world, tackling perception, state estimation, modeling, action generation, planning, manipulation, and interaction with the world.

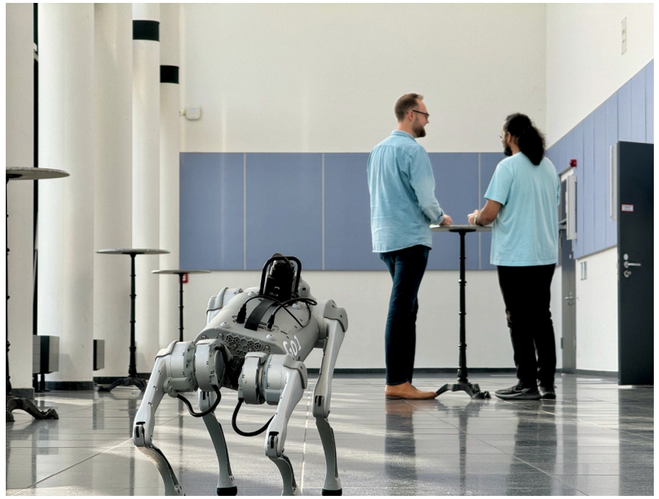
The program will teach students methods for robot perception, modeling, action generation, planning, and interaction with the world to act smartly and autonomously. It will combine competencies from engineering and computer science to build such systems and solve relevant problems of our society today – from sustainable technology and agricultural robotics, over service robotic applications, towards autonomous vehicles.

The Program links the engineering and computer science side of robotics with relevant societal applications, such as agricultural robotics and other fields such as autonomous cars. A key element is that such relevant applications operate at a high of excellence (supported, e.g., through PhenoRob). Furthermore, it tackles mobile systems, robots, and other vehicles that navigate and act autonomously without humans in the loop.

NINE REASON TO STUDY MOBILE ROBOTICS

- Bonn - a German Excellence University
- DFG Cluster of Excellence on Robotics and Phenotyping
- Research-Orientated Education
- Comprehensive Curriculum
- Expert Faculty
- High-Precision Sensing and Reconstruction
- Machine Learning and AI
- From Sensing to Action
- Legacy of Probabilistic Robotics developed in Bonn

More about the program
www.moro.uni-bonn.de



COURSE SHEME

1st Semester	2nd Semester	3rd Semester	4th Semester
Introduction to Mobile Robotics	Robot Mapping		Master's Thesis
M01 6 SWS 9 CP	M05 5 SWS 6 CP		
Trajectory Estimation	Machine Learning for Robotics and Computer Vision		
M02 4 SWS 6 CP	M06 4 SWS 6 CP		
Python for Robotics and Computer Vision	Mobile Robotics Research Part 1	Mobile Robotics Research Part 2	
M03 4 SWS 6 CP	PS 4 SWS 6 CP	PW 4 SWS 6 CP	
Computer Vision	Modules of the subject-related elective area - Summer -	Modules of the subject-related elective area - Winter -	
M04 6 SWS 9 CP	ES 12 CP	EW 24 CP	MT 30 CP

REQUIREMENTS AND APPLICATION

We target students that have a BSc degree in one of the following subjects: Computer Science, Geodesy or any related topics.

Academic Admission Requirements

Bachelor degree according to the German Grading Scale (see website of the Program)

The following qualifications must be demonstrated by the university degree:

1. At least 18 ECTS credits from mathematics;
2. At least 6 ECTS credits in programming;
3. Further achievements from at least one of the subject areas
   a. Mathematics,
   a. Programming,
   b. Engineering sciences,
   c. Physics,
   d. Computer Science and
   e. Geodesy

   The students must achieve in total at least 26 credits from the areas 3a- f.;
4. An academic thesis of at least 10 ECTS credits.

Language Requirements

- TOEFL paper-based: 575 points
- TOEFL internet-based: 90 points
- IELTS: 6.5

Native English speakers, German, Swiss, Austrian citizens with Abitur / Matura and students who received their first degree entirely in English taught study programs fulfill the language requirements.

Mandatory Documents

- Bachelor's Certificate of a at least three-year Bachelor's Degree in a related discipline
- Transcript of Records of your Bachelor's Degree
- TOEFL or IELTS result
- Curriculum Vitae

Please note, we do not admit based on GRE scores. Based on the application documents, the examination board will decide your eligibility for the Master's program.

FEES

The Master's Program "Mobile Robotics" is **tuition-free**. Students have to pay a small semester fee, which includes a regional public transport ticket (called „Semester Ticket“).

CARRER OPPORTUNITIES

Students graduating from the M.Sc. Mobile Robotics will have numerous possibilities for finding positions in the industry as well as in academia. Potential employers could be:

- Car- and transport-related industries working on autonomous driving, over
- Companies offering direct robotics applications,
- Sensing-related companies,
- Industries working with applied machine learning and AI
- Engineering and automation market.
- Industry domain of augmented reality
- Academia