Master in Applied Research for Computer Science (M.Sc.) - Hof University — Hof University

Source: https://www.hof-university.com/studying-at-hof-university/our-degree-programs/applied-research-in-computer-science-msc.html

Digitalization is not mainly about converting analog information to a digital format, but includes open innovation, changing business models and providing services around products. In a world where fast time to market is increasingly important, corporations are well advised to listen to their customers for suggestions for improvement or new products and work closely together with universities and research labs to incorporate the latest technologies that help them fulfilling their customers' needs.

If you want to become part of this game and help bringing results from foundational research to practical use with usage scenarios from the local enterprises in upper Franconia and its surrounding, then this Master study program is right for you. Become part of our multi-disciplinary team of experts and start your scientific career, become an entrepreneur or prepare for a job.

With this Master's program, you will be able to

identify and analyze current and future challenges in the IT industry,

bring together user needs and technological possibilities,

develop appropriate solutions and

implement and evaluate them in interdisciplinary teams.

In addition, you benefit from

a unique Master's degree focusing on applied research,

well-trained and structured problem solving skills,

development of your intercultural competence,

excellent career perspectives, both in industry and in academia or as an entrepreneur.

Applied researchThe study program consists of work in research projects of the research groups at the Institute of Information Systems (iisys), special lectures in research methodology as well as lectures in computer science subjects, organization science and business law. There will be a good mixture of practical work like programming, training of social skills in meetings and by giving presentations as well as conceptual work like creating architecture models, doing criteria-based comparisons or literature reviews to find suitable algorithms and research approaches.

Playing with the latest technologiesWe are working with the latest technologies like machine learning and artificial intelligence, cyber-physical systems, smart data and data analytics, virtual and augmented reality, autonomous cars and digital mobility as well as digital healthcare and the internet of things. We bring them together into applications that really help people, are easy to use and respect users' privacy requirements. We are both taking up recent trends like usability, speech recognition and natural language processing as well as listening to challenges the industry is facing.

What do we offer?Being part of our multi-disciplinary team of experts with backgrounds in computer science, electrical engineering, business information systems, information science and business law will enrich your career. You can combine the best of multiple worlds by gaining a Master's degree, having fun with the latest technologies, learning about scientific research methods as well as experiencing the working situation in our partner corporations.

Semester 1 and 2:

Mandatory modules

New Technologies in Computer Science

Design Science Approaches in Computer Science Research

Behavioral Approaches in Computer Science Research

Designing and Developing Business Models

Project Seminar

Research Project

Electives (choose two)

Security of Information Systems

Data Engineering and Analysis Methods

Mixed Media (AR, VR, MR)

IoT Architectures

Security Research Seminar

Information Structuring and Visualization

Semester 3: Master‘s thesis

Based on the work package within a research project, the student elaborates a large scientific paper with substantial scientific pretension according to international standards.

As a graduate, you...

are qualified for many different jobs in a scientific career but also in a private company, depending on the research group that you choose

get direct support from our digital startup center Einstein1 in building your own company right away

will get an opportunity to proceed with PhD studies if you have excellent grades.

You are ready to work as

Scientific assistant

IT project manager

Software architect

Requirements engineer

Business analyst

Backend application developer

Data scientist

Data engineer

Specialist for industrial internet of things

Consultant for digital transformation

Academic requirements

Bachelor’s degreeor similarin computer science, media informatics, mobile computing or business information systemsor a comparable study program from an accredited university, at least 210 ECTS or equivalent (depending on home country);minimum grade 2,5according to the German grading system (75%). Accredited universities are those that are listed inAnabinwith status H+. Graduates from mechanical engineering, civil engineering, electronics & communications engineering or math / physics are not eligible.

Above-average grades in object-oriented programming, software engineering, computer networks and databases

Applicants with less than 210 credits (ECTS) can be accepted but have to gain the missing credits by eitherdoing an internship (at least 23 weeks) as long as no internship was done during the Bachelor’s degree.Attending appropriate modules at Hof University (for applicants who already did an internship).For both alternatives, please calculate an additional (fourth) semester.

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See also the information about the application process for further requirements.

Language requirements

You need to prove yourproficiency in English. This can be done with either of the following:

TOEFL minimum 90

IELTS 6.5 or above

In addition:Basic language skills in German, proven by official test score documents -minimum level A1

The application process for this research Master consists of a written and an oral part.

For thewritten part, you hand in a certification about an internship or practical work in the computer industry that lasted at least 18 weeks as well as a scientific work that you produced on your own (e.g. your Bachelor‘s thesis or a seminar paper).

You further have to choose atopic from our research groupsand do atwo-page literature reviewcovering important scientific publications in the chosen topic.

If the written part is passed with a grade of at least 2.3, you are admitted to theoral part, which can be done in a video chat. To prepare for the oral part, you get a case study concerning a challenge in the chosen topic from the written part. You present your solutions for the case study and answer additional questions in a 30 minutes oral exam in English language. If you pass the oral exam with a grade of at least 2.3, you will be admitted to the Master‘s program.

All applications must be done via ouronline application portal Primuss.

The application period for winter intake is between April 15 and May 31.

The application period for summer intake is between November 05 and November 30.

An admission committee intensively scrutinizes all applications and decides about final admission. Admission letters will be issued in June for winter intake and December for summer semester intake.

If you have any questions concerning the application process, please contactadmission(at)hof-university.de.

Please have a look at the APO (general examination regulations) for detailled information of the possibilities of transfering credits from other universities or getting other achievements recognized.

Intensive support

Hof University offers a safe, friendly and open-minded study environment. Find out more about our intensive personal support for international students!

Applied Research in Computer Science

Winter-semester: April 15 - May 31

Summer-semester: November 5 - November 30

Info and services

Timetable

Here you find your timetable.

The campus is the management and administrative center of the university. Here you will find the university library, high-tech laboratories and university sports facilities.

More about Campus Hof

The research topics that are addressed in this Master's program can be found as bullet points in the following list, which is grouped by research area:

Please note:

For your mandatory literature review required for the application, please pick one of the bullet points (not the research area/headline in general)!

Industry 4.0 - vertical integration

Condition monitoring and predictive maintenance

Industry 4.0 - processing performance, quality and status data

Application of machine learning approaches in a production environment

Deep neural networks for vision (scene and object recognition)

Generative AI for image creation

Simulation of cognitive robotic systems

Learning in robotic systems

Ambient assisted living technologies

Virtual and augmented reality in health care applications

Robotic technologies used in care processes

Digitalization of health care

Use cases and adoption of technologies to them

Process Discovery for multi-modal unstructured data (text, images, sensor data)

Multi-modal Predictive Business Process Monitoring (event logs + text or images)

Overcoming data scarcity to lower the implementation hurdles for process mining (data augmentation, transfer learning)

Process Mining for dynamic environments (varying resource availability, decision-intensive processes)

Natural user interfaces for man-machine interaction (speech, VR, AR, gestures, …)

Fast inferencing for deep neural networks on edge devices (image, video, speech)

Voice-assistants with LLMs as the backbone

Training of Vision Language Models (VLMs) on diverse diagrams (UML, BPMN, …)

Highly Customizable Manufacturing Execution Systems (MES) as the core of Industry 4.0

Smart factory / Industry 4.0

Artificial Intelligence in Supply chain management

Supply Chain Analytics

Practical approaches for Supply Chain Digitization

Secure distributed systems

Distributed Denial of Services (DDoS) amplification

Vulnerability analysis

Privacy and anonymizing services

Computer-Supported Cooperative Work (CSCW) from Knowledge Workers' Perspectives

Human-Computer Interaction (HCI) for Browsing Information Spaces

Human Factors in Information Structures

Özgür from Turkey

As humans, we are devising, making, and using tools to learn, to create, to cooperate, to change, and to express. I came to Hof University, because I wanted to broaden my horizon by learning more about the new digital tools.

I have to admit that studying the M.Sc. in Applied Research in Computer Science is challenging. But if you accept this challenge decisively, you will have the great chance to improve yourself. After this point, you can head directly to the target. You will always get the best support from the academic staff. With good grades, you can also get financial support.

This university is an invaluable resource for the region and for the students who need to open their minds together with practical knowledge. Learning German adds to your positive experiences and helps you a lot in expressing yourself and communicating better with society. The beautiful environment of Hof, the cool weather, the peaceful life in this town, and the politeness of the people are blissful. Just as they say: right on top of Bavaria!

Gowtham from India

„The hardness of the admission process and acceptance ratio of the ARC course is directly proportional to the learning curve of the students who opt for it.“

Why do you think so?„ARC is structured in such a way that students undergo complete autonomous learning and decide their interests for projects (intensive coding). Along with 4 mandatory subjects, students focus on writing scientific papers for the first year. And the 3rd semester is where learning from the previous year is completely utilized in the Master‘s thesis.“

What specialization did you choose?„I opted for Computer vision and Virtual reality, studied ARC with good grades and now work as a Computer vision researcher (Wissenschaftlicher Mitarbeiter) with the same iisys lab and research group I started my journey with.“

So the program fulfilled your expectations?„With the tremendous growth in academics thanks to Hof University faculty, and the naturistic, peaceful, cold, small but cute city life of Hof, this is all I wished for when I opted for my Master‘s program in Germany. I seriously recommend it as it is a public-funded course with grueling but intense 3 semesters of learning.“

Head of Program

Student Affairs - Program manager

Prof. Dr. René Peinl

Thursday: 14:00 -15:30

Michael Luft

Please contact our Welcome Center.