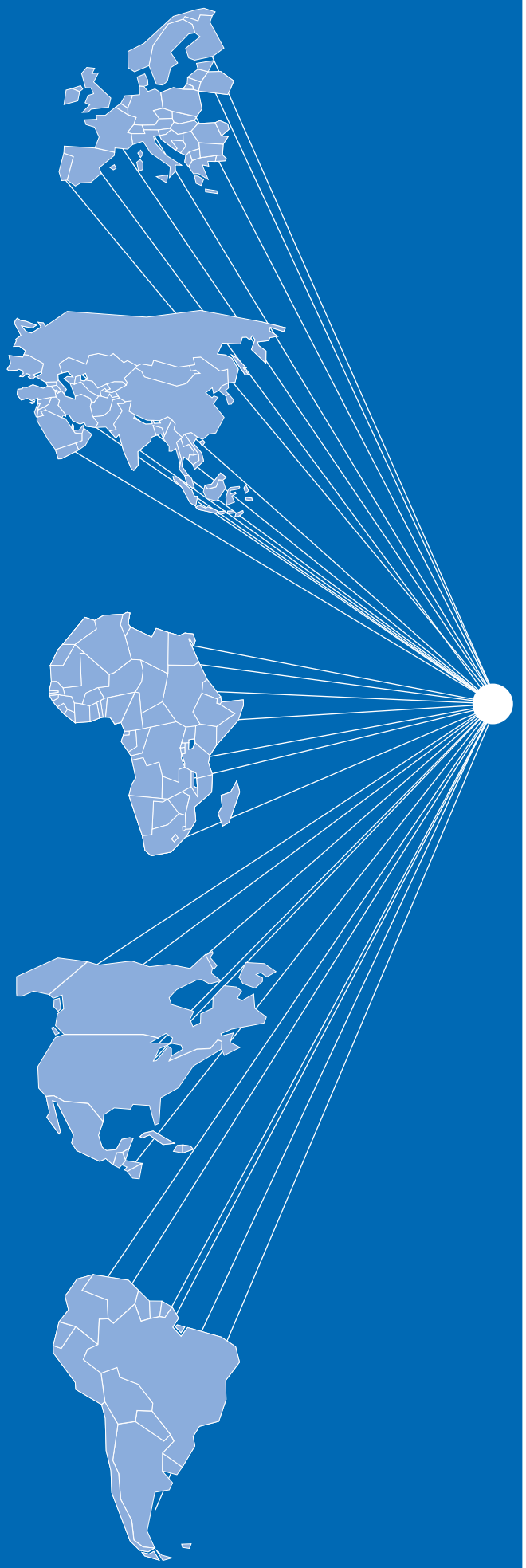

b-it

Bonn-Aachen
International Center for
Information Technology

Annual Report 2025

Foreword by the Chair of the b-it Foundation

Gonca Türkeli-Dehnert
State Secretary at the Ministry of Culture and Science of the German State of North Rhine-Westphalia.
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The Bonn-Aachen International Center for Information Technology (b-it) continues to stand as a unique academic collaboration in Germany, uniting the University of Bonn, RWTH Aachen University, Hochschule Bonn-Rhein-Sieg, and the Fraunhofer Institutes FIT and IAIS. This partnership brings together complementary strengths in fundamental research, applied science, and innovation – creating an ecosystem where education and research directly contribute to societal and a technological progress.

Three aspects in particular illustrate the strength of this collaboration. First, b-it combines academic excellence with practical relevance through close cooperation between universities and Fraunhofer research. Students benefit from direct exposure to real-world innovation processes, while industry gains access to young talents trained in responsible, human-centered AI. Second, joint initiatives such as the Founders Award and entrepreneurship programs foster an environment where scientific discovery and innovation go hand in hand. Third, shared research infrastructures such as the JUPITER AI Factory, which will begin operation in 2025, enable large-scale AI experimentation that would not be possible within a single institution. Together, these elements make b-it a model of interdisciplinary collaboration and applied innovation.

This spirit of cooperation and excellence was once again demonstrated when the b-it-bots team from the Autonomous Systems program won the RoboCup@Work World Championship 2025. Their achievement reflects not only the quality of teaching and supervision but also the effectiveness of the close collaboration between academic and applied research within the b-it network.

Each partner institution benefits from this exchange. The universities gain access to Fraunhofer's applied research ecosystem, accelerating technology transfer and real-world validation of academic ideas. Fraunhofer, in turn, benefits from the strong academic foundation and international reach of the partner universities, ensuring a steady influx of highly qualified researchers and students. Hochschule Bonn-Rhein-Sieg strengthens its innovation-oriented teaching, while the University of Bonn and RWTH Aachen benefit from the applied perspective that Fraunhofer provides.

The three international Master's programs – Human-Centered Intelligent Systems, Life Science Informatics, and Autonomous Systems – continue to attract highly motivated students from around the world. They represent b-it's commitment to combining excellence, inclusion, and societal relevance. Graduates take leading roles in academia, technology, and policy, driving innovation across sectors and regions.

Gonca Türkeli-Dehnert
State Secretary, Ministry of Culture and Science NRW
Chair of the b-it Foundation Council

b-it Mission Statement

The b-it is a leading international center for research and education in computer science and artificial intelligence in the high-tech region of Bonn-Rhein-Sieg-Aachen, combining academic excellence with industry-relevant applications. Through our international Master's degree programs, our research-oriented teaching and our collaborative network, we prepare the next generation of experts for top positions in research and industry.

We combine the expertise of the Excellence Universities of in Bonn and Aachen, the application-relevant research of the Fraunhofer-Gesellschaft and the Hochschule Bonn-Rhein-Sieg. In our three exclusive degree programs – Human-Centered Intelligent Systems, Life Science Informatics and Autonomous Systems – we qualify students for leading positions in an increasingly digitalized world.

As a condensation point for regional cooperation, we offer a diverse network of competent partners for research and development issues. Our aim is to drive innovation and actively shape sustainable technological progress in the region through the integration of computer science and artificial intelligence in research and teaching as well as through unique practical laboratory internships at Fraunhofer institutes.

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Hochschule Bonn-Rhein-Sieg
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Report by the Scientific Directors

The year 2025 marked a major milestone for the Bonn-Aachen International Center for Information Technology (b-it). Building on its strong tradition of excellence, b-it expanded research and education in artificial intelligence, data science, and human-centered systems.

A key development was the launch of the Master of Science in Human-Centered Intelligent Systems (HCIS), replacing the Media Informatics program. By integrating AI, human-computer interaction, and system design, HCIS aligns academic excellence with societal and industrial needs while promoting responsible, inclusive technology.

Research achievements were impressive. The b-it-bots team won the RoboCup@Work World Championship 2025. Faculty advanced fields from ERC-funded AI empathy research to bioinformatics, robotics, and data-driven policy design. Dr. Alpha Tom Kodamullil (Fraunhofer SCAI) received an Early Career Grant for semantic, data-driven approaches to personalized Alzheimer therapies.

Projects such as the BAföG Chatbot from Fraunhofer FIT's Generative AI Lab showed how research-driven AI can improve public services and foster human-centered technology. These initiatives strengthen the b-it ecosystem and give students hands-on innovation experience.

A transformative step is b-it's involvement in the JUPITER AI Factory, Europe's first exascale-class AI supercomputing facility. With Fraunhofer FIT, IAIS, and RWTH Aachen providing the scientific foundation, JUPITER enables large-scale AI research in climate modeling, healthcare, and digital ethics while serving as a living lab for next-generation education.

Looking ahead, b-it will continue to nurture talent, drive interdisciplinary research, and promote responsible digital innovation with partners in academia, industry, and government.

Prof. Dr. Stefan Decker
RWTH Aachen University and Fraunhofer FIT

Prof. Dr. Sascha Alda
Hochschule Bonn-Rhein-Sieg

Prof. Dr. Stefan Wrobel
University of Bonn and Fraunhofer IAIS

Stefan Decker
RWTH Aachen University
and Fraunhofer FIT

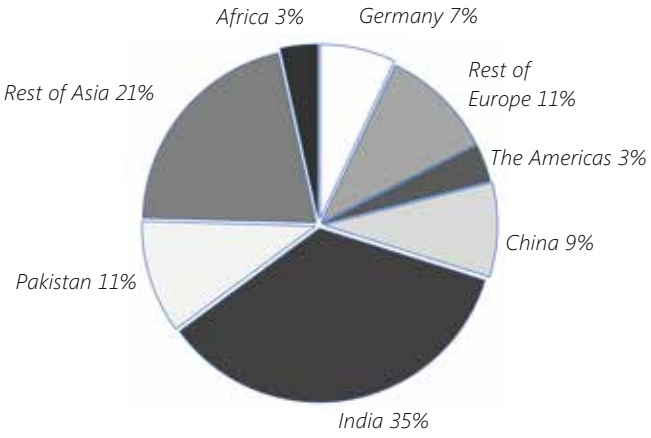
Prof. Dr. Sascha Alda
Hochschule Bonn-Rhein-Sieg

Stefan Wrobel
University of Bonn
and Fraunhofer IAIS

b-it in Profile

The southwest of North Rhine-Westphalia (NRW) is one of the largest, most vibrant locations in the European media and telecom industry. It is also one of the most innovative and fast-growing biotech regions in Germany, and there is much interest in the emerging fields of mechatronics and robotics. To make it the optimal place to study for professional work in these fields, the Bonn-Aachen International Center for Information Technology (b-it) has been established as a joint venture of RWTH Aachen University, University of Bonn, Hochschule Bonn-Rhein-Sieg (H-BRS) and the research institutes of the Fraunhofer Institute Center Birlinghoven Castle.

b-it offers highly selective international master`s programs in Applied IT, as well as summer / winter schools for qualified undergraduate computer science students. The b-it Research School offers doctoral training. Since 2018, most courses take place in the newly erected b-it building on the Poppelsdorf Campus for Mathematics and Computer Science of Bonn University. Admission to the b-it master's programs is linked to, and conditioned upon, placement in research lab courses at the participating Fraunhofer institutes. Students in good standing are offered financial support during these lab courses.



Home countries of new b-it students.

The b-it Universities Institute offers English language Master of Science (M.Sc.) programs in Media Informatics and Life Science Informatics, while the b-it Applied Science Institute offers a Master of Science in Autonomous Systems. The Master Programs prepare students for successful international careers that require technical excellence and leadership, creativity and the ability to innovate. b-it master programs are distinguished by their international orientation, structured according to the European Credit Transfer System (ECTS) standard, their focus on IT competence, and the deep integration of teaching and research.

For the participating universities, the b-it programs have also helped pave the way towards a smooth transition from the traditional German diploma system to the Bachelor-Master system following the Bologna accord; for example, the b-it master programs were the first to be accredited within the participating universities in 2004-2005. A comprehensive external evaluation in 2019 confirmed the very positive developments and stimulated a few new accents. The success of the b-it programs is also demonstrated by a very good placement record, both in academia and industry.

b-it is financially supported by a 56 M € Foundation initiated through the Bonn-Berlin program of the German federal government, as well as by matching NRW state funds.

Honors and Awards

Prof. Erwin Prassler and Thomas Rose in retirement

After 21 years as a professor of Autonomous Systems at H-BRS, Prof. Erwin Prassler retired at the end of the winter semester 2024/25. He celebrated his goodbye with a final lecture and a goodbye party that took place on February 13th in the presence of many current and former colleagues, students, and family members. During his time at H-BRS, Prof. Prassler coordinated various national and EU robotics research projects, was active in the Industrial Activities Board of the IEEE Robotics Automation Society, served as IEEE Vice President for Industrial Activities between 2016-2017, and founded multiple robotics companies, most recently KELO Robotics GmbH, which produces modular mobile logistics robots. Throughout his tenure, Prof. Prassler left a big mark on the Autonomous Systems master's program and the robotics research at H-BRS.

On September 30, 2025, Professor Thomas Rose's active affiliation with Fraunhofer FIT came to an end. In recent years, he headed the Microsimulation & Econometric Data Analysis Department, where he played a key role in shaping research areas such as media processes, process management, data analysis, decision support systems, crisis management, and the application of distributed ledger technologies. Since the founding of b-it, he has directed the Master's Program in Media Informatics and, as the teaching coordinator for Fraunhofer FIT within b-it, has played a pivotal role in linking research and education. Starting in November 2025, Dr. René Reiners, head of the Human-Centered Engineering & Design Department at Fraunhofer FIT, will take over this responsibility. This ensures that the close integration of research and teaching at b-it not only continues but is also enriched by FIT's current research priorities.

Professor Jürgen Bajorath appointed External Professor at Nara Institute of Technology

Professor Jürgen Bajorath was appointed External Professor in the Data Science Center of the prestigious Nara Institute of Technology, Japan in late 2024. The Nara Institute of Technology (NAIST), Ikoma City, Japan, is known for its world-leading research and education in information, biological, and material sciences. It was selected for the Top Global University Project funded by the Japanese government to enhance its international competitiveness, and it is recognized for producing accomplished researchers in science and technology, including Nobel laureates, as well as for its significant research contributions.

Natalia Quiroga wins 1st AFCEA 2024 prize

The successful tradition of MAS students at the AFCEA prize has continued in 2024: Natalia Quiroga Perez, alumna of the MAS and now working as a research associate in the INNERVATE project at H-BRS, was awarded the 1st AFCEA prize for her exceptional master's thesis work entitled "Experience-based path planning framework for real-time learning from demonstration". In this work, Ms. Quiroga proposed a graph-based framework for learning robot motions from human demonstrations that combines two aspects: (i) a pre-learning stage known as motor babbling, during which the robot essentially learns the structure of its own body through random motions, and (ii), subsequent graph adaptation for acquiring demonstrated motions as well as path planning for actual robot execution. The developed method was demonstrated on three robots at the A2S institute of H-BRS, demonstrating its applicability for various robot embodiments.

Professor Erwin Prassler.


Professor Thomas Rose.


(From left:) Professor Teena Chakkalayil Hassan (H-BRS) is delighted with Natalia Quiroga Perez (H-BRS) for winning 1st place. © AFCEA e.V. Bonn


Professor Jürgen Bajorath.

Events and Visits

MAS program presented with a stand at the European Robotics Forum 2025

The European Robotics Forum, a yearly event organized by euRobotics aisbl, took place in Germany for the first time (in Stuttgart) between March 25th-27th, 2025. The MAS program presented its activities there with a stand. Interested visitors could see various robot demos (performed with the robots Jessie and LuxAI QTrobot), and discuss past and ongoing projects with numerous members of the program (Prof. Teena Hassan, Prof. Sebastian Houben, Prof. Javad Ghofrani, Dr. Alex Mitrevski, Natalia Quiroga Perez, Michal Stolarz, and Youssef Mahmoud Youssef were all there for the event). Multiple students of the MAS program were also present and could witness the newest developments in the robotics field.

H-BRS Research Day in conjunction with the celebration of the 30 years of existence of H-BRS

On May 9th, the biennial H-BRS research day took place, in conjunction with the celebration of the university's 30-year anniversary. The MAS program was presented at the event with a stand that included various posters about our recent and ongoing research projects, as well as posters of four ongoing PhD projects in our research group (by Jordan Schneider, Michal Stolarz, Mohammad Wasil, and Youssef Mahmoud Youssef). Two of our robots (Jessie and LuxAI QTrobot) were also shown at our stand: QTrobot was greeting visitors in its typical friendly fashion, while Jessie was performing pre-programmed bimanual object manipulation to demonstrate its capabilities. We also had QTrobot at our stand two years ago, but this was the first time we presented Jessie, our newest bimanual manipulator that has a KELO ROBILE mobile platform with two UFactory xArm 6 arms.

ExplorAItion Day at Deutsche Telekom – b-it students to explore AI innovations

On November 18, 2025, b-it students will visit Deutsche Telekom's headquarters in Bonn for the ExplorAItion Day. The visit will provide participants with an exceptional opportunity to experience how artificial intelligence is driving innovation in one of Germany's leading technology companies. Through hands-on workshops, live demonstrations, and discussions with Telekom experts, students will gain practical insights into real-world AI applications, digital transformation strategies, and potential career paths in the tech industry. At the same time, Deutsche Telekom will benefit from engaging directly with talented international students and future IT professionals, fostering collaboration and knowledge exchange between academia and industry. This visit continues b-it's strong tradition of linking research-oriented education with industrial practice and highlights how strategic partnerships with leading companies can enhance both academic learning and corporate innovation.

Panel discussion (from left to right): Prof. Petra Gehring, Professor of Philosophy at TU Darmstadt and member of the FIT Board of Curators; Dr. Elke Baumann, Deputy Director at the Federal Ministry of Finance; Sven Paul, Head Division at the Federal Ministry for Family Affairs; Thomas Zander, Executive Board Member responsible for Organization and Finance at the Social Association VdK NRW e.V.

Anniversary celebration: "50 years of data for evidence-based economic policy"

On July 1, 2025, the "Microsimulation & Econometric Data Analysis" department at Fraunhofer FIT – which also shares its research expertise with b-it students through the "Data Visualization and Analytics" course – celebrated its 50th anniversary at Schloss Birlinghoven with guests from politics, business, and academia. Prof. Stefan Decker welcomed around 120 attendees and opened a diverse program: in addition to keynote speeches reflecting on past decades from political and scientific perspectives, a panel discussion provided space for current debates. The focus then shifted to present and future challenges, including social inequality in the education system, the use of AI in policy consulting, and the influence of social trends on empirical research.

Assessing the impact of planned policy measures and their consequences often requires enormous amounts of data. The beginnings of evidence-based policy consulting at the Birlinghoven campus date back to the analog computer EAI 231R-V, which was considered unique in Germany at the time for its computing capacity and led to Fraunhofer FIT's very first contract in 1975: estimating federal BAföG (student grant) expenditures based on a sample of several thousand recipients. Since then, both the range of research questions and the complexity of simulation models have grown considerably. What has remained constant, however, is Fraunhofer FIT's political neutrality and scientific objectivity in handling highly sensitive microdata.

b-it-bots team wins RoboCup@Work competition at RoboCup 2025

The b-it-bots team from the MAS program has done it yet again: At the RoboCup World Championship, which took place between July 15th-20th in Salvador, Brazil, the team emerged victorious in the RoboCup@Work competition, which focuses on developing mobile robots for industrial applications. This marks the third world championship title for the team, after victories in 2019 and 2023. This victory was also historic for the team, as they obtained the highest overall number of points in the history of the RoboCup@Work competition. At the competition, the b-it-bots team was represented by four students of the MAS program: Gokul Krishna Gandhi Chenchani, Anudeep Sai Sajja, Amirhossein Soltani, and Ayusee Swain.

Research @ b-it

Dr. Iman Awaad..

Professor Lucie Flek.

Professor Javad Ghofrani.

Iman Awaad defends her PhD

On March 19th, research associate Dr. Iman Awaad had a successful defense of her PhD at Osnabrück University, and obtained a magna cum laude for her work. Her dissertation was titled "Towards Autonomous Object Substitution by Domestic Service Robots" and was concerned with the problem of modelling the required knowledge so that robots are able to resolve situations in which certain everyday tasks, such as making tea in a specific teacup, may not be possible to perform directly, e.g. because the teacup is currently dirty; in such situations, a robot should be able to come up with an alternative solution so that it can accomplish its task, such as using a mug instead. The PhD was originally advised by Prof. Gerhard Kraetzschmar and Prof. Joachim Hertzberg from Osnabrück University. After Prof. Kraetzschmar's passing in 2019, Prof. Paul G. Plöger stepped in as an advisor.

Javad Ghofrani joins the Autonomous Systems Group and becomes head of the A2S institute

At the start of the summer semester 2025, a new professor joined the MAS program: Prof. Dr. Javad Ghofrani became a Professor of Computer Science with a focus on Autonomous Systems. Prof. Ghofrani's work focuses on autonomous distributed systems, industrial automation, and AI-supported robotics. He joins H-BRS after holding a position as a deputy professor for service robotics at the University of Lübeck. In addition to his professorship post, he also became head of the A2S Institute at H-BRS, as the previous director, Prof. Teena Hassan, took the post of Vice President for International Affairs and Digitalization at H-BRS.

Professor Lucie Flek receives ERC Starting Grant

Professor Lucie Flek received an ERC starting grant of about 1.5 Mio Euros for five years for her project "LLMpathy" in which she will investigate the understanding of the interplay of human modeling and social intelligence via Large Language Model simulations.

An ERC Starting Grant is funding provided by the European Research Council (ERC) to support excellent, young researchers at the beginning of their independent careers. The grant allows early-career scientists of any nationality, typically with 2 to 7 years of experience after their doctorate, to establish their own research teams and pursue ambitious projects in Europe and worldwide. Professor Flek is interested in machine learning research for natural language processing (NLP), including AI robustness and safety. The application areas range from large language models and conversational systems, across clinical NLP and mental health research, to misinformation detection and social media analyses.

Additionally to the ERC starting grant Professor Flek won two more research projects: one funded by BMFTR (Federal Ministry of Research, Technology and Space) and another by DFG (German Research Foundation). Congratulations Professor Flek!

In the approved DFG grant entitled "Hyperbolic Linguistic Representations" she will work in a joint project with research groups from Ben Gurion University, Israel, on the efficient improvement of multilingual language models.

Europe's AI Booster: JUPITER AI Factory brings exascale power to business and science

With the JUPITER AI Factory, a central pillar of Europe's AI infrastructure is being established in Jülich. Start-ups, small and medium-sized enterprises, and industrial companies will have access to Europe's first Exascale-class supercomputer JUPITER. The AI Factory is also open to research institutions and the public sector. Thanks to the computing power of JUPITER, which will go into operation at Forschungszentrum Jülich in the coming months, AI applications can be developed, tested, improved and scaled faster than ever before. In addition, JUPITER will also receive a specialized inference module that accelerates access to AI models via the cloud. Several leading German AI institutions have joined forces for the collaborative project, including Fraunhofer FIT and Fraunhofer IAIS.

The AI Factory in Jülich serves as a one-stop shop for both research and industry. The focus is on strategic key sectors, including healthcare, energy, climate change, education, media, the public sector and finance.

As the first supercomputer of the Exascale era in Europe, JUPITER will surpass the threshold of one quintillion computing operations per second, making it one of the world's most powerful AI supercomputers. The JUPITER AI Factory is designed to drive the training of next-generation AI models and will particularly support German and European start-ups and small and medium-sized enterprises in developing high-performance, secure, and privacy-compliant AI applications.

The JUPITER AI Factory (JAIF) is funded with approximately €55 million by the EuroHPC Joint Undertaking, the German Federal Ministry of Education and Research, and the Ministries of Science of North Rhine-Westphalia and Hesse.

Strengthening partnerships and innovation: H-BRS and Fraunhofer FIT deepen collaboration

The partnership between Hochschule Bonn-Rhein-Sieg (H-BRS) and Fraunhofer FIT continues to grow and deepen through a series of initiatives that connect research, education, and innovation. With the appointment of Professor Britta Essing as an Honorary Professor at H-BRS, the signing of a Memorandum of Understanding (MoU), and the second consecutive H-BRS Founders Award Ceremony, both institutions underline their shared commitment to advancing innovation and entrepreneurship in the region.

The most recent Founders Award Ceremony took place on October 17, 2025, at the Fraunhofer FIT campus in Schloss Birlinghoven – marking the second time the event was hosted at this venue. The award highlights the creative and entrepreneurial achievements of H-BRS students and underscores the close connection between academic excellence and applied innovation. Professor Essing's dual role at H-BRS and Fraunhofer FIT exemplifies how academic and applied research can complement each other in shaping a culture of human-centered digital transformation. The MoU builds on this foundation by expanding opportunities for collaborative research, joint teaching formats, and knowledge transfer.

These strengthened ties also benefit b-it, where H-BRS and Fraunhofer FIT are long-standing partners. The collaboration will further enhance opportunities for b-it students and researchers – through closer integration of applied research projects, innovation-oriented learning environments, and direct engagement with industry partners. In this way, b-it will continue to thrive as a hub for excellence at the intersection of academic education, digital innovation, and entrepreneurship.

Graphic representation of the Jülich supercomputer JUPITER. © Forschungszentrum Jülich

Founders Award Ceremony at Schloss Birlinghoven with Professor Britta Essing.

Master Program in Human-Centered Intelligent Systems

Prof. Dr. Jan Borchers, Media Computing

Professor Lucie Flek.

Professor Dr. Ulrike Meyer.

Professor Dr. Rafet Sifa.

List of employers of MI Alumni *(Universities & Research): Airport Research Center GmbH, b-it, b-it Research School, Centro Nacional de Investigaciones Cardiovasculares, CERTH, Charité Berlin, Chinese Academy of Science, COSBI, Czech Technical, ETH Zurich, Fraunhofer FGAN, FIT, FKIE, FOKUS and IAIS, FSU Jena, Hasso-Plattner-Institut, HHI Berlin, Imperial College, INRIA, Institute of Molecular Medicine, Karlsruhe Institute of Technology (KIT), K. U. Leuven, Max Planck, Microsoft Research (Cairo), National University of Computer & Emerging Sciences, National University of Ireland Maynooth, National University of Sciences and Technology, Research Center Jülich, Robert Bosch Foundation, RWTH Aachen, Suez Canal University, Swiss Federal Institute of Technology, Uniklinik Aachen, Uniklinikum Bonn, Universidad Tecnologica de Panama, Universitätsspital Basel, University Clinic Carl Gustav Carus; Universities of Agder, Arab American Jenin, Asia and the Pacific, Atma Jaya Yogyakarta, Augsburg, Bahria, Bonn, Cambridge, Düsseldorf-Essen, Dresden, Duisburg-Essen, Edinburgh, Engineering & Technology Peshawar Pakistan, Ghent, Göttingen,*

The Master program in "Media Informatics" will be renewed with a new Master of Science (M.Sc.) program in "Human-Centered Intelligent Systems" starting from Winter term 2025/2026. The new program targets at an in-depth understanding and hands-on experience in the rapidly evolving domain of intelligent interactive systems, blending artificial intelligence, human-computer interaction, and system design. It is a response to several key developments and needs in the field:

Advancements in AI

Recent advancements in AI, particularly in areas like deep learning, have revolutionized the capabilities of interactive systems, from image recognition and natural language processing to generating content across text, image, audio, and video. Central to this are foundational models and a mix of learning methods that incorporate simulation and informed learning. Moreover, the practical aspects, including the deployment and ongoing learning of AI-based systems, are also addressed.

Human-Computer Interaction

How to shape the interaction with AI-infused systems has opened new frontiers in HCI research and practice. From conversational user interfaces (CUIs) like voice-controlled assistants and generative AI systems using large language models to avatars in virtual and augmented reality, the way we interact with digital systems is changing profoundly. These technologies bear the promise of more intuitive and accessible interfaces for a more inclusive digital world, but they also carry the potential of a future full of annoying, biased, inhumane systems surrounding us if we do not pay attention to their interaction design.

Social impact and ethics

Allowing AI systems into our lives has profound implications for society at large. Technologists can no longer build and release products without considering the impact of these systems on their users and society.

Industry demand and skill gap

Industry demand for professionals with expertise in both AI and HCI is skyrocketing. However, there is a notable gap between the skills needed and the expertise available in the workforce. This program aims to bridge that gap by equipping students with both the technical and methodological knowledge, skills, and competencies to work at the intersection of AI and HCI and help shape a desirable future of living with intelligent interactive systems. It combines a strong academic university education with practical labs at participating Fraunhofer institutes.

This course requires a strong background in computer science and is ideal for those who are looking to specialize in the rapidly evolving field of human-centered interactive systems. It is structured in two main areas "Artificial Intelligence and Machine Learning" and "Human Centered and Interactive Technologies", each being introduced with a compulsory introductory module. These areas of study are complemented by an area "Use and Social Impact" containing modules from psychology, social studies and ethics. To allow students to additional follow their own specific interests, a fourth area allows the students to select additional modules from a full spectrum offered in the various computer science programs at RWTH Aachen University and Bonn University Bonn. However, this fourth area is restricted to ensure the desired specialization of the students completing the program.

MI graduates & new HCIS students

A total of 18 Media Informatics students have completed their master's degrees in the academic year of 2024-2025. The graduates quickly found interesting positions either as doctoral students in German or foreign universities/institutes or in top IT companies. Eleven new students from Romania, Germany, Iran, and China have enrolled in the newly designed HCIS program.

FIT's applied research contributes to shaping the new HCIS program

As a long-standing transfer and research partner, Fraunhofer FIT plays an active role in shaping the new program. Drawing on its broad experience in applied digital research, Fraunhofer FIT contributes content, practical examples, and research impulses that strengthen the link between academic learning and real-world innovation. Through the Generative AI Lab, students gain access to current developments in artificial intelligence – from generative models and adaptive interfaces to explainable systems and human-AI collaboration. Concrete examples such as FIT's BAföG chatbot project, which applies conversational AI to address social and administrative challenges, illustrate how intelligent systems can make technology more accessible and user-oriented. In addition, FIT's Human-Centered Engineering & Design training portfolio complements the curriculum by providing practical methods and workshops on UX design, prototyping, and responsible AI development.

By integrating these elements, Fraunhofer FIT ensures that the HCIS program offers students a unique learning environment where theory meets application. The collaboration not only enriches the academic experience at b-it but also equips graduates with the skills to design intelligent systems that are innovative, inclusive, and sustainable.

MI Success Story

Tsovinar Chugaszyan

While at b-it, Tsovinar Chugaszyan served as the elected Student Representative on the Media Informatics Study Committee. Following her studies, she translated her proactive nature into an international career bridging technology, innovation, and education. Her journey at SAP – the largest tech company in Europe – has started as a software developer and progressed to Product Manager and Ecosystem Development Lead, where she was responsible for global enablement programs and expanding innovation communities across Europe and Central Asia.

She was recognized as an SAP Champion in 2025 for her leadership and contributions to building SAP Communities across several countries. Tsovinar has since transitioned temporarily to academia as an independent consultant, where she leverages her industry expertise to help educational institutions design curricula focused on Business Process Management, Artificial Intelligence, and Innovation Management – preparing the next generation with future-proof skillsets.

As an educator and consultant, Tsovinar is passionate about inspiring students to pursue their entrepreneurial ideas. She uses as a reference her own master's thesis at b-it – an original idea she developed with great passion that has led the creation of CourseMapper.de. This collaborative learning platform evolved into a research topic at RWTH Aachen University and is still actively used at other German universities today.

Hamburg, Hasselt, Heidelberg, Houston, Oldenburg, Ireland, Maynooth, Ienes Kepler, Kiel, Leipzig, Mainz, Münster, Paris, Rotterdam, Sud, Stuttgart, Tilburg, Tirana, Toronto, Trento, Tübingen, Washington, Waterloo, Western Australia, West Indies, Zurich; TU Darmstadt, TU Dresden, TU Eindhoven, TU Munich.

List of employers of MI Alumni *(Business)*:

4tree GmbH, Ableton, Adecco Engineering & IT, Adecco Phaholyothin Recruitment Ltd., Adidas, Agfa Healthcare, Airbus, Alcatel-Lucent, Ancud IT Beratung, Ansaldo STS, ANSR Source, AOL, ARC International, ArcSoft, Avedas, Avid Technology, awato Software GmbH, Bank of Mexico, Bayer Technology Services, BCA Auctions, BCA Europe, Bertelsmann, Bertrandt Ingenieurbüro GmbH, BESA GmbH, Blimp.Mx, Bombardier Inc., Brainloop, BTC Business Technology Consulting, Capgemini, Capitaworld Platform Pvt. Ltd., CAS, CBC Cologne Broadcasting Center, Cellent AG, CGI, CIGNA, Cloudberrytec, CMLabs Simulations, Cognizant Technology Solutions, COMNEON, Contentteam, Crytek, CSC India, Daedalic Entertainment, Daimler, Deloitte AG, Delta Engine, Demax, Deutsche Bank AG, Deutsche Telekom, devolo AG, Dolby Laboratories, DP ITServices GmbH, Dynevo (Bayer), Ericsson, Euromoney Institutional Investors, European Computer Telecoms, Evimed Online, Exact Software, Facebook, Famous Group, Finantix Srl, Forth corporation, Fox Chase, Game Analytics ApS, GIVE.sg, Global Crop Diversity Trust, Goodyear, Google, Grandcentrix, GTT Technologies, Hewlett Packard Enterprise, HITS, Huawei, Humance, i22 internetagentur, IBM, IdeaObject Softwares, Ilypsys, IMC BV, IMC Financial Markets, Infineon, Inforcept Networks, Internet Company, IP Labs, iPharro Media, ISRA Surface Vision GmbH, ITBrainiacs, IVU Traffic Technologies, IW-One, Johnson Controls, Keynote SIGOS, Kisters, Kuveyt Turk Participation Bank, Lakshmi Technology and Engineering Industries, LHS Telekommunikation, Ligatus GmbH, Lufthansa Systems, Lycos, MarAnCon, Merck, Mastercard, MeVis Medical Solutions AG, Microsoft, Mobilab Solutions, moneymeets GmbH, Monsanto, Movilizer, NAVTEQ, Nato Communications and Information Agency, Nemetschek AG, NeuroSky, Inc., Nexcom IT Services, Next Level Integration, Novartis, NTT Data, NVIDIA, Oando Plc, Oracle, Patersons, PCI Geomatics, Pepsi, Philips, Plinga, PricewaterhouseCoopers, Qiagen, Qosmotec Software Solutions, QSC, ReadSoft, Recogizer Group, Recommind, Roamworks Research & Development GmbH, Robert Bosch GmbH, Roche, S&P Capital IQ, Samsung Electronics, SAP, SD Inspiring Travel, sd&m, SE Consulting, Secat, Shell, SHS VIVEON, siCAT, Siemens, Siemens Healthcare, SIGOS, Simfy, Sogou Inc., Solnista, Solutions 4 Media, Sony, Steinberg Media Technologies, Sytel Reply, T-Systems, TeamViewer, Teleca, Telemotive, Tessella, Texas State - Health and Human Services (HHSC) Agency, Thomson Reuters, TravelTainment, Turk Telekom, Twitter, Vantage Labs, Viacom, vmware, Vodafone, Wacom Europe, Werum Software & Systems, Westwing Home and Living GmbH, Whowish, Widespace AB, Wieden+Kennedy, Workplace Systems, World Bank, Xerox Research Centre Europe, Yahoo!, Yieldlab AG, Zalando

Prof. Dr. Jürgen Bajorath, Life Science Informatics

Prof. Dr. Martin Hofmann-Apitius, Life Science Informatics

List of employers of LSI Alumni

(Business): @Wise (Estonia), 3B Pharmaceuticals, 4GATC Biotech, AbbVie, Accenture, Accura Gen, Alcimed, Aldi Süd, Arbern GmbH, ARBERN L.L.C-FZ, Asahi Kasei, ASI Data Science, Astra Seneca, atai Life Sciences AG, BASF SE, Bayer, Bayer Monsanto, BenevolentAI, bigspark, BiosolveIT, blue BEYOND GmbH, Boehringer Ingelheim, Bristol Myers Squibb, carpooling.com GmbH, Centene Corporation, Centogene, Clade Therapeutics, Clariant, Clue Points, Coca Cola HBC, Comma Soft AG, Comuny GmbH, ConfigCar GmbH, Coty Germany, Curetis, Dairy Data Warehouse, Dassault Systèmes, Deutsche Post, DFind Science and Engineering, DHL, Diapharm, DuPont, ecSeq Bioinformatics, Edelweiss Connect, Enhanc3d Genomics Ltd, Ennovation VC, Enveda Biosciences, epitome GmbH, Ericsson, Esprit, ESSEC & MANNHEIM EXECUTIVE EMBA, Evotec, Fast Focus BV, Finsbury Glover Hering, Freeletic, Fresenius Kabi, F-Star Therapeutics Inc., G42, Galileo Press, GAMOMAT Development GmbH, Gamomat GmbH, GATC Biotech, Generali Deutschland AG, Genestack, Genome Biologics, Germany Market Vector Indexes, Germany Smart4Diangistics, Glaxo Smith Kline, Glover Hering, Hamilton Medical, HealthCare Global, Hearts & Science, Heraeus, Hoffmann-La Roche, Hype Innovation, IBM, IIT Bangalore, Interpretomics, IQVIA, ITTM S.A., Johnson & Johnson, KWP Inside HR, LabVantage Solutions Inc., Land O'Lakes Inc., Lead Berlin, Lead Discovery Center, Leaf Bioscience, LHS Telecommunications, LinkTechnica, L'Oréal, Lufthansa Cargo, MacKinsey, MarAnCon, Mastercard AG, Max Dellbrück Center Berlin, MBition, McKinsey, Mediengruppe RTL, Medsciences Biotech, Medtronic, Merck, Micro biolytics, Miltenyi Biotec, Mimacom Flowable, Molecular Connections Private Limited, Molecular Devices, Molecular Health GmbH, Monsanto, msg systems ag, Nestlé Institute of Health Science, Netcetera Software matters, Novartis, Novo Nordisk, numa, Nuvisan ICB GmbH, Octapharma, ok future, Omnicom Media Group, parlamind GmbH, Perkin Elmer Inc., Pfizer, Philips Research North America, Phillips, Postbank, PQE Group, ProfileXpert, Protagen AG, Publicis Group, quintly Inc., Rancho BioSciences, real.digital, Recogizer, Rewe, REWE Digital, Revvity Signals, Roche, RTL, SAATHII, Schlumberger, Sciex, Seassoon Information Technology, Siemens Digital Industries Software, Smart4Diagnostics GmbH, SOPHiA GENETICS, Statista, StepStone, SumUp, Syeneos Health, Synechron Ltd., Syngene Ltd., Synthego Corporation, The Janssens Pharmaceutical Company, Tubs System LLP, UAE Omnicom, UBS, Union Chimique Belge (UCB Pharma), United Brands Marketing, Zerogravity

Master Program in Life Science Informatics

The Master`s Program in Life Science Informatics (LSI) is offered by the University of Bonn and RWTH Aachen University in cooperation with the Fraunhofer Institutes of Scientific Computing (SCAI) and Applied IT (FIT). The degree is conferred by the University of Bonn. This interdisciplinary program educates the participants to successfully master the novel technical and economic challenges at the crossroads of biotechnology, medicine, pharmaceutics and computer science. The curriculum consists of three main blocks: Computer Science and Mathematics for life scientists; Basic principles of Life Science Informatics; Biology of the cell and systems biology.

Major topics include biomedical database systems, data mining and machine learning, statistical genetics, drug design, medical imaging and visualization, computational neuroscience, computational modeling of regulatory and metabolic networks, cheminformatics, bioinformatics, molecular modeling, molecular biology, pharmaceutical chemistry, biotechnology and systems biology. The program emphasizes a profound understanding of biological structures (such as proteins, nucleic acids, genes, metabolic, neural networks and organisms) as well as the appropriate application of methods of computer science to this field. It also includes training designed to sensitize students to the ethical implications of emerging biotechnologies. This combination will enable the successful students to understand biological or medical problems and to find appropriate and valid solutions that bioinformatics can offer. The program is characterized by a significant share of research lab courses embedded in both basic and applied research of the participating Fraunhofer Institutes as well in labs of CEMBIO (Center for Molecular Biology) and LIMES (LIfe and MEdical Sciences Research Biocenter Bonn). The final six months of the program are dedicated to the Master thesis which can be done in cooperation with industry.

Graduates of the program are well prepared for the typical professional tasks in applied data analysis, systems biology and data modeling, in industrial functional genomics, drug design and pharmacology. The Aachen-Bonn-Cologne-Düsseldorf region is home to many prospective employers, including excellent academic institutes and research driven companies. The regular and well attended meetings of the LSI Series "The ABC of Life Science Informatics" in the last years have contributed to strengthen ties with scientists of the region. Several interesting Master thesis have been carried out in collaboration with them. LSI students were also instrumental in this process. This has increased the visibility of the program considerably, also on a larger geographical scale.

This year more than 270 students applied to the Master program of Life Science Informatics (2024: 350 applications). Twenty-two students will start their studies in October.

LSI Success Stories

Elizaveta Popova

Elizaveta joined the LSI program in October 2023 with a Bachelor's Degree in Physics from the Department of Medical Physics of the Lomonossov University in Moscow, Russian Federation. She entered the group of Professor Hofmann-Apitius as a research student in November 2023. In her Master Thesis she works on "Leveraging Multimodal Large Language Models to Extract Mechanistic Insights from Biomedical Visuals: A Case Study on COVID-19 and Neurodegenerative Diseases". Her work is pioneering the extraction of scientific information from graphical abstracts (science cartoons); with a special focus on the putative co-morbidity between COVID-19 and neurodegenerative diseases.

Endri Gupta

Endri graduated with a Bachelor's Degree in Biochemistry from the University of Delhi, India, one of India's top Universities. She joined the LSI program in October 2022. Endri worked as a student assistant in HPCA lab of the University of Bonn, then became a research student at ZBMed in Cologne and joined the research group of Professor Hofmann-Apitius at Fraunhofer SCAI for her Master thesis on the topic "Towards Co-Morbidity-Aware Clinical Guidance: Integrating AI, Knowledge Graphs, and Biomedical Evidence for Mechanism-Informed Decision Support". Underlying is a co-morbidity aware vector store for clinical guidelines; a system that is highly innovative and completely without precedence in translational science. On 1st October 2025, Endri joined Gesis, a Leibnitz Institute for the Social Sciences in Cologne.

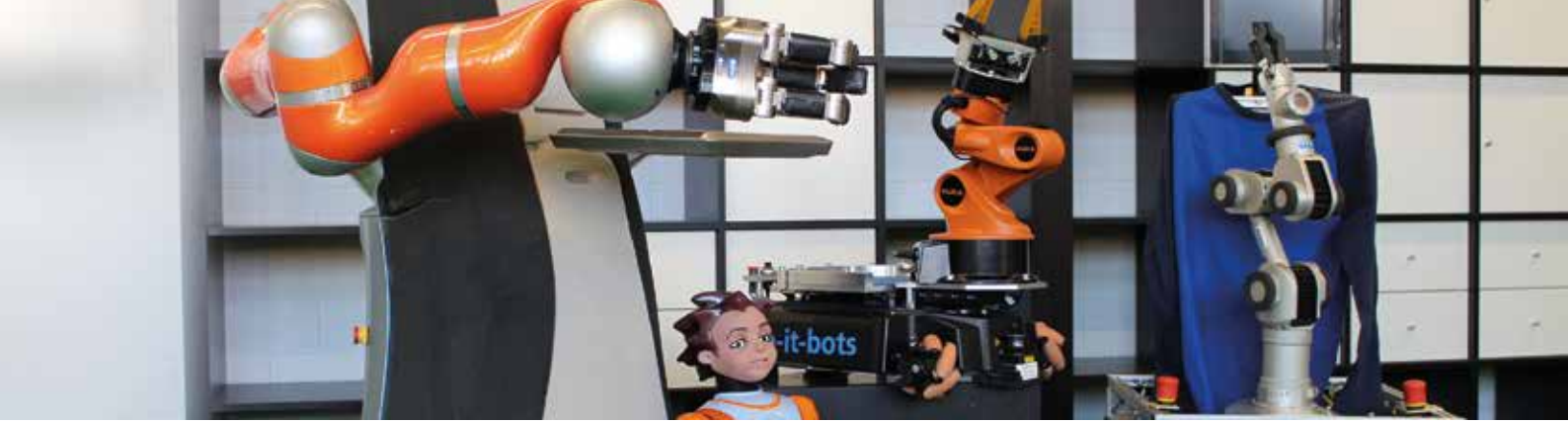
Astha Anand

Astha started her studies in LSI program at b-it in 2021 with a Master's Degree from Mysore University in India in Biotechnology. During her time at Mysore University, she was a JNU-CEEB Fellowship holder from 2017-2019. She joined the group of Professor Martin Hofmann-Apitius as a research assistant and worked during her Master thesis on a new, innovative approach (LLM-RAG) that powers an expert answering system for pest control decisions.

Bariş Yapiçi

Bariş joined the LSI program with a Bachelor's Degree in Molecular Biology and Genetics from the Middle East Technical University in Ankara, Turkey, in October 2023. In 2024 he worked temporarily as student assistant at the University of Cologne and later on joined Fraunhofer SCAI as a research student. Currently, he works on his master thesis in the group of Professor Hofmann-Apitius, where he uses knowledge graphs and generative Artificial Intelligence (AI) to establish a brokering system for data collaborations and science domain portfolio management.

List of employers of LSI Alumni *(Universities & Research):* *Alan Turing Institute, Berlin Institute of Health, Biotech Research & Innovation Centre (BRIC), b-it Research School, Boston Children's Hospital, Centre for Molecular and Biomolecular Informatics (CMBI), Centro Nacional de Investigaciones Cardiovasculares, Centre for Molecular and Biomolecular Informatics (CMBI), Charité Berlin, Children's Cancer Research Hospital, Christian-Albrechts-Universität Kiel, Czech National Centre for Biomolecular Research, DKFI, ELI Beamlines, European Molecular Biology Laboratory, ETH-Domain, ETH Zürich, European Bioinformatics Institute, European Bioinformatics Institute, Fraunhofer FIT, Fraunhofer IAIS, Fraunhofer IME, Fraunhofer ITMP, Fraunhofer SCAI, Fundación Centro Nacional de Investigaciones Cardiovasculares, German Center for Cancer Research (DKFZ), German Center for Neurodegenerative Diseases, German Institute of Human Nutrition, Harvard Medical School, Hasso Plattner Institute, Heidelberg Institute of Theoretical Studies (HITS), Helmholtz Centre for Infection Research, Helmholtz Zentrum München, Hertie Institute for Clinical Brain Research, Hospital of the University of Bale, Hotkiss Brain Institute, IFOM, IIT Jodpur, Imperial College London, India University of Copenhagen, Institut Pasteur, Institute of Pysics of the Academy of Science of the Czek Republic, Karolinska Institut, King Abduly City for Science and Technology, King Faisal Specialist Hospital and Research Center, Leibniz Information Center for Science & Technology (TIB), Leibniz Institut für Ostseeforschung, Massachusetts General Hospital, Max Planck Institute for Biophysical Chemistry, Max Planck Institute for Heart and Lung Research, Max Planck Institute for Molecular Biomedicine, Max-Planck-Institute for Molecular Genetics, Max Planck Institute for Neurobiology of Behaviour, Max Planck Institute for Neurological Research, Max Planck Institute for Plant Breeding Research, Max Planck Institute for the Biology of Ageing, Max Planck Institute Tübingen, Microsoft Research-University of Trento Centre for Computational and Systems Biology (COSBI), MPI fo Cognitive and Brain Science, MPI for Molecular Genetics, National Center for Advancing Translational Sciences (NCATS), National Centre for Biological Sciences, National Centre for Biomolecular Research, National University of Ireland, National Technical University of Singapore, NIH, Nuvisan Innovation Campus Berlin, Philipps, Princess Nora Bint Abdulrahman University, Radboudumc – University Clinic Centre of the University of Nijmegen, Research Center Jülich, Research Institute for Farm Animal Biology, RWTH Aachen, SCK CEN (Belgian Nuclear Research Centre), South University of Science and Technology of China, Swiss Federal Institute of Aquatic Science and Technology, The Alan Turing Institute, TRON, TU München, Twincore – Centre for Experimental and Clinical Research, University Clinic Gustav Carus Dresden, Universitätsklinikum Schleswig-Holstein, University College London (UCL), University of Nebraska Medical Center, Western University, ZBMed, and the universities of Alberta, Amsterdam, Bonn, Bern, Cambridge, Cologne, Copenhagen, Dresden, Duisburg-Essen, Düsseldorf, Edinburgh, Erlangen-Nürnberg, Ghent, Iowa, Kiel, Leipzig, Leon, Luxemburg, Macquerie, Mainz, Marburg, Münster, Netherlands, Oxford, Sheffield, Tübingen, Utrecht, Western Australia, Vienna, Wageningen, Western Onatario, Würzburg, Zürich.*



Master Program in Autonomous Systems

Prof. Dr. Javad Ghofrani, Autonomous Systems

Prof. Dr. Teena Hassan, Autonomous Systems

Prof. Dr. Sebastian Houben, Autonomous Systems

Prof. Dr. Erwin Prassler, Autonomous Systems

The master's program in Autonomous Systems is an international program, taught entirely in English, offering multi-faceted training in the fields of artificial intelligence and robotics. The program is offered by the b-it Applied Science Institute (b-it AS) in the Department of Computer Science at Hochschule Bonn-Rhein-Sieg (H-BRS). b-it AS cooperates closely with Fraunhofer IAIS in implementing the program, which started in the winter of 2002. Two dual degree programs exist, with the University of New Brunswick in Canada and the German-Jordanian University in Jordan. In addition to the accreditation certificate from the German Accreditation Board, the program has the special ASIIN accreditation label and the Euro Inf Label from the European Quality Assurance Network for Information Education (EQANIE).

The focus of the program is on enabling and integrating the necessary intelligence necessary for human-centered robot autonomy in dynamic environments, rather than on the hardware-related aspects of robotics. Students take a number of core courses in the first semester, as well as compulsory seminars and practical courses throughout their studies; through this, students get a solid theoretical background in autonomous mobile robots, machine learning, probabilistic reasoning, and human-robot interaction. The courses are combined with research work, often conducted at the Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS) and other partner institutions. Numerous robot platforms are used for educational and research purposes, including the Toyota Human Support Robot (HSR), QTrobot, NAO, Pepper, and the KUKA youBot, as well as Jessie, which is a custom bimanual platform by KELO Robotics GmbH.

The MAS program has always attracted the interest of students from all over the globe, as can be seen from the long list of countries from which the students have come from. In the academic year 2024/25, 24 students joined the program from an applicant pool of 623 candidates.

The program is managed by four professors (Javad Ghofrani, Teena Hassan, Sebastian Houben, and Erwin Prassler), three research associates (Youssef Mahmoud Youssef, Dr. Alex Mitrevski, and Dr. Iman Awaad) as well as researchers who have been recruited through various projects, namely: Center for Assistive Technologies Rhein-Ruhr (ZAT Rhein-Ruhr), DKZ.2R center for data literacy, GARRULUS, INNERVATE, and e2x (E-Assessment). These researchers are Dr. Iman Awaad, Tim Metzler, Alexandra Mielke, Natalia Quiroga, Ludovico Scarton, Jordan Schneider, Michal Stolarz, Mohammad Wasil, and Youssef Mahmoud Youssef.

The faculty and staff are actively involved in many scientific activities, including: memberships in technical committees of IEEE; reviewing activities for various journals, such as IEEE Transactions on Robotics, IEEE RA-L, Robotics and Autonomous Systems, and Autonomous Systems; workshop organising committees; as well as numerous program committees of workshops and scientific conferences, such as IROS, ICRA, CVPR, ECAI, ICAPS, ICDL, RO-MAN, and the RoboCup Symposium.

MAS Success Stories

Bharath Santhanam

AI Application Engineer, NEURA Robotics

I graduated from H-BRS with my master's degree in Autonomous Systems (MAS) in December 2024. The program provided a strong foundation in robotics and AI, enhanced by hands-on experience with platforms like the Toyota Human Support Robot (HSR) and the Kinova robotic arm. My thesis focused on improving robot safety in anomalous environments. During my studies, I also gained valuable industry experience through various research projects at Fraunhofer IAIS. The excellent education I received prepared me well for my current role as an AI Application Engineer at Neura Robotics. What truly set H-BRS apart was the supportive environment created by the professors and staff, who were always willing to collaborate on innovative projects and allowed students the autonomy to pursue their research interests.

Suhasini Venkatesh

Research Software Engineer, ZB MED – Information Centre for Life Sciences

I graduated from the MAS program at H-BRS in 2024. The program offered a unique combination of theoretical depth and practical exposure. Through its well-structured coursework and hands-on approach, I was able to deepen my understanding of intelligent systems and strengthen my software engineering skills. The academic environment, along with the support from faculty and peers, played a key role in shaping my professional development. Today, I work at ZB MED, where I contribute to the development of AI-based solutions in the life sciences domain. The MAS program provided me with a strong foundation and the confidence to take on challenging roles in research and development.

Samuel Wiest

PhD student, University of Bremen

I graduated from the MAS program at H-BRS in February 2024. During my time there, I had the opportunity to work on various hands-on projects, including ontology development for robot failure analysis with Kelo Robotics GmbH. My master's thesis at Fraunhofer IAIS focused on Bayesian optimization for the design of experiments. These experiences from MAS are vital to my work at the University of Bremen, where I am pursuing a PhD on the development of automated simulated testing regimens for robot navigation.

Shalaka Satheesh

Data Scientist, Fraunhofer IAIS

I started the MAS program during the COVID-19 pandemic, so I attended the first semester remotely from my home country. Even with all the uncertainty due to the pandemic, right from the start, I felt supported and found the MAS staff to be approachable. This also eased my transition to a foreign country. Later, the research and development project provided me with the opportunity to explore collaborations with external research institutes, and I was able to start my research work in speech processing at Fraunhofer IAIS. I continued my research for my thesis on evaluating language models at the same institute and have continued to work there full-time since graduating in April 2024. It is the MAS program that provided me with the foundation for my current research and I am grateful for this.

List of employers of MAS Alumni *(Business):*

Ableton, Aeolus Robotics, Inc., Agile Robots, Amazon, anessa, ANYbotics, ASIMOV Robotics, Banksoft, BitTwister Informationstechnik GmbH, BMW, Bosch, Boston Consulting Group, Boston Dynamics, Cerence Inc., CHRONEXT, cyber:con GmbH, DEUTAWERKE GmbH, Delphi, Wuppertal, Elektrobit, ETAS GmbH, Exciera Technologies, Expleo Germany GmbH, Cologne, Extor GmbH, Faro GmbH, Stuttgart, Fetch Robotics, Gade Autonomous Systems Private Limited, Google/Alphabet, GPS, IBM, Informatica, Ingen Robotics, inmation Software, Intrinsic (an Alphabet company), idealworks, KBR/NASA, KELO Robotics GmbH, Kuka Robotics, LMX, Locomotec GmbH, Lucid Motors, M-Files Corporation, M2P Consulting, Magazino, MeasX, MHP Management- und IT-Beratung GmbH, MYBOTSHOP GmbH, NavInfo Europe, Neobotix GmbH, Next Kraftwerke GmbH, Köln, NTT Data, Nuance Communications, RabbitAI, Heidelberg, Rapyuta Robotics, RBOT, Recogizer, Rethink Robotics GmbH, Rfrnz Gmbh, Robert Bosch GmbH, RoBoTec PTC GmbH, Robots Alive Consulting, Shadow Robot Company, Siemens, Systemantics India, TBA Group, The MathWorks, TomTom, Trivago, Düsseldorf, Ubica Robotics, VMware, Wingcopter, xIndustry AI

List of employers of MAS Alumni *(Universities & Research):*

Hochschule Bonn-Rhein-Sieg – Autonomous Systems Group – Graduate Institute, DFKI, DLR, FAST-NUCES, Fraunhofer FKIE, Fraunhofer IAIS, Fraunhofer SCAI, Freie Universität Berlin, Heriot-Watt University, Instituto Superior Técnico (IST) – Universidade de Lisboa, Jacobs University, KU Leuven, LAAS-CNRS, National University of Computer and Emerging Sciences, Norwegian University of Life Sciences, Örebro University, Osnabrück University, Rhine-Waal University of Applied Sciences, RWTH Aachen, TU Delft, TU Wien, TUBITAK-UZAY Space Technologies Research Institute, Universidad Anáhuac Mayab, University Jaume I, University of Bielefeld, University of Bonn, University of Groningen, University of Hertfordshire, University of Western Australia

b-it Universities Institute

ABC – three letters that stand for a veritable "magic triangle": the region between Aachen, Bonn and Cologne, which is not only economically strong, but also a leader in science, education and research. The large number of research establishments based here make the area one of Europe's biggest and most important science landscapes. Almost 10 percent of all German students – around 130,000 people – are studying at the Rheinisch-Westfälische Technische Hochschule in Aachen, the Rheinische Friedrich-Wilhelms-Universität Bonn and the Universität zu Köln, which together constitute one of the most important higher education locations in Europe. The three ABC institutions are closely linked and collaborate in many fields of teaching and research.

University of Bonn

The University of Bonn is a research-oriented university with currently about 31,500 students. Its research tradition of 200 years is closely linked to the names of Hermann von Helmholtz, Heinrich Hertz and Friedrich August Kekulé who carried out seminal work at the University of Bonn. This strong academic tradition has been continued until present with the Nobel laureates Wolfgang Paul and Reinhard Selten. Bonn cooperates with numerous other universities and research institutions around the globe. The specializations it has developed enjoy worldwide recognition. More than 4,800 students from foreign countries are enrolled in Bonn. Their presence underlines the international character of the university and enriches both academic and social life in Bonn. Living up to its long tradition as a classical university with a full range of academic disciplines, the University of Bonn offers 200 different subjects and degrees. In 2019, the University of Bonn was elected as one of the 11 "elite universities" within the German excellence program, after having already received the record number of six "Excellence Cluster" grants in 2018.

RWTH Aachen University

RWTH Aachen University was founded as a Polytechnic in 1870 with considerable support from local industry. In 1948 it was established as Rheinisch-Westfälische Technische Hochschule Aachen (RWTH), the Institute of Technology of the State of North Rhine-Westphalia. Today, RWTH is one of the most renowned technical universities in Europe with around 45,000 students. RWTH offers over 170 courses of study (undergraduate and postgraduate). The RWTH master programs educate engineers who are keen to engage in R & D, innovation, and entrepreneurship. Since 2007, RWTH Aachen was elected and re-elected three times as one of the "elite universities" within the German excellence program. In the current Times Higher Education Ranking, RWTH Aachen University is placed 90th among the several thousand evaluated universities.

The spacious Hofgartenwiese is a major summer attraction on the University of Bonn campus.

Entrance of Birlinghoven Castle.

The Birlinghoven Castle campus is one of the largest and most influential computer science research sites in Germany. About 600 researchers work in the IZB institutes. That represents a quarter of the Fraunhofer ICT Group, Europe's largest IT research organization. The institutes collaborate closely with the European ERCIM network of national IT research centers as well as with leading research establishments in the USA, Eastern Europe and Asia. Three IZB institutes contribute to the b-it master programs Media Informatics and Life Science Informatics:

Fraunhofer FIT

For about 40 years, the Fraunhofer Institute of Applied Information Technology Fraunhofer FIT has been conducting R&D on applying computer science to the digital transformation of society with main locations in Birlinghoven, Bayreuth and Aachen. Methodologies developed in FIT combine the two areas Human-Computer centric research and Data centric research and applying them to areas of societal importance such as Digital Energy, Digital Health, and Digital Business – with a special focus on infrastructure and applications of data spaces as an emerging corner stone of the digital society. FIT his housing the NRW Blockchain Center, the Fraunhofer W3C representation, the Fraunhofer Personnel Certification Authority, and playing a leading role in the Fraunhofer Center for Digital Energy.

Birlinghoven Castle campus: One of its strategic goals is helping to shape the development of 5G applications and their ecosystems for SMEs. Companies can use our 5G campus network that implements the latest network standards to test the viability of innovative services based on 5G functionality before wider roll-out of 5G technology. We work closely with our clients in the iterative processes of developing and testing 5G infrastructures. The application fields we focus on include production and remote maintenance, BIM processes in construction, mobile edge computing, the Internet of Things, and mixed reality.

Fraunhofer SCAI

The Fraunhofer Institute for Algorithms and Scientific Computing SCAI contributes to the Life Science Informatics curriculum at b-it through the Department of Bioinformatics at SCAI. Two professors teaching at b-it are leaders in this department: Prof. Dr. Martin Hofmann-Apitius and Prof. Dr. Holger Fröhlich. Both are experienced in translational research with a focus on scientific challenges in the pharmaceutical and biotechnology industry. Therefore, research in the department represents the entire data- and knowledge-based value chain of translational biomedical research.

Semantic technologies, including Natural Language Processing and information extraction based on Large Language Models, help to represent biological and medical knowledge in rich, disease-specific knowledge graphs. These graphs represent, e.g., neurodegenerative diseases such as Alzheimer's or Parkinson's or neuro-psychiatric diseases such as Major Depression or Schizophrenia in computable cause-and-effect models. AI and Data Science technologies are applied applications, including models for improving treatments for patients (precision medicine) and drug discovery.

SCAI involves students from the LSI curriculum early on in collaborations with industry partners. This gives students a first glimpse of industrial research.

b-it Applied Science Institute

Hochschule Bonn-Rhein-Sieg

Hochschule Bonn-Rhein-Sieg (H-BRS) was founded in 1995 and has around 8,500 students, 150 professors and 400 research associates. The university campuses are located in Sankt Augustin, Hennef and Rheinbach.

The Department of Computer Science has a young and modern character. The technical equipment, the individual support for students, the good IT infrastructure and the excellent general study situation provide an optimal basis for successful studies. Research and teaching are closely linked in all courses. Thus, students not only benefit from the know-how of the individual research projects and professors, but can also actively participate in the successful projects.

The Autonomous Systems program (MAS) is offered by the Applied Sciences Institute at b-it which is a cooperative partnership between two renowned German centers of excellence: the Department of Computer Science at H-BRS and the Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS). The Autonomous Systems Group conducts cutting-edge interdisciplinary research to enable the intelligence necessary for the autonomy of robots in dynamic environments they share with humans. To meet the challenges of such environments, they develop reliable systems and ensure their safety by combining research from the fields of artificial intelligence, human-robot interaction, and intelligent manipulation.

Fraunhofer IAIS

The Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS, based in Sankt Augustin/Bonn and Dresden, is one of the leading scientific institutes in the fields of Artificial Intelligence (AI), Machine Learning and Big Data in Germany and Europe. Around 350 employees support companies in the optimization of products, services, as well as in the development of new technologies, processes and new digital business models. Fraunhofer IAIS is shaping the digital transformation of our working and living environments: with innovative AI applications for industry, health, and sustainability, with forward-looking technologies such as large-scale AI language models or Quantum Machine Learning, with offers for training and education or for the testing of AI applications for security and trustworthiness.

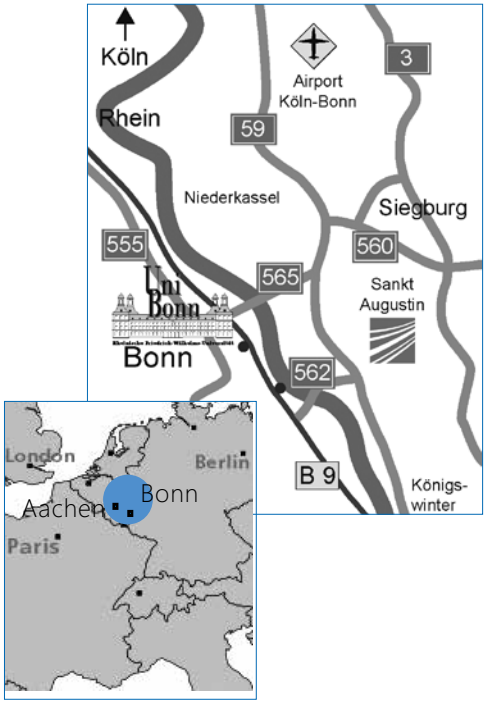
Hochschule Bonn-Rhein-Sieg.

As one of four leading partners, Fraunhofer IAIS conducts cutting-edge research in the "Lamarr Institute for Machine Learning and Artificial Intelligence", which is part of Germany's AI strategy and is permanently funded by the Federal Government and the State of North Rhine-Westphalia. The direct transfer of research results is ensured, among other things, by the "Competence Platform KI.NRW", which is also led by Fraunhofer IAIS. Furthermore, Fraunhofer IAIS coordinates the "Fraunhofer Big Data and Artificial Intelligence Alliance", which bundles the expertise of more than 30 Fraunhofer institutes and provides specialists from enterprises with an established training program in data science and AI. In addition, there are many years of close cooperation in research with the University of Bonn and b-it.

General Information

General Admission Requirements

- A first university-level degree (B.Sc., B.Eng.), as specified for the individual programs, with grades well above average is required. The Graduate Record Examination (GRE) is strongly recommended;
- All courses are held in English, thus fluency in English is vital. Depending on the particular b-it program, a proficiency level of B2 or B2+, per the Common European Framework of Reference for Languages, is required.
- Working knowledge of German is necessary to take up some of culture that the Aachen – Bonn – Cologne region has developed over the last 2,000 years. Therefore, a basic German language course is offered before start of the program and during the first year.
- Admission is coupled to placement in the Fraunhofer lab courses and therefore strictly limited. Application deadline has been March 1 for Fall admission but may change from year to year; check www.b-it-center.de for current admission details.



Fees and Finances

Semester fees of around 350 € per semester covers student activities, subsidized meals, and free public transportation in the whole state of North Rhine-Westphalia.

A student's monthly expenses, including study material, will be about 1.000 Euro. b-it does not offer formal scholarships but several student assistantships are available on a competitive basis. For information on funding from German sources please contact the DAAD – German Academic Exchange Service www.daad.de.

Studying in Bonn

Most of the teaching in b-it is concentrated in Bonn and its eastern neighbor, Sankt Augustin. Newcomers to Bonn soon grow very fond of the city – a fact confirmed by thousands of students and academics, German and foreign, who have come here to learn, teach or research. Since the German Bundestag moved its seat and parts of the Federal Government to Berlin in 1999, Bonn has attracted a number of international organiza-tions, especially United Nations bodies, and some major corporations. Among others, Deutsche Telekom and Deutsche Post have their headquarters there. Now Bonn is evolving into an internationally recognized science region – with the university as one of the dynamic forces driving this change. In addition, Bonn offers a wide variety of attractions and amenities. The city's most famous son, Ludwig van Beethoven, is the star attraction of a lively and varied arts and culture scene. The city boasts an opera house, several theatres, concert halls and other venues, as well as a range of fascinating museums.

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