

Annual report 2022

Institute for Business Cybernetics e. V.



Institut für
Unternehmenskybernetik

an der RWTH Aachen

One of our research focuses is applied AI. This annual report was translated by AI (deepl.com). Any errors you find reinforce the need for further work in this research area.



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Dear readers, loyal IfU members,

The year 2022 is drawing to a close and it is a pleasure for us to report to you and you from this year. A time of exciting achievements and progress.



Prof. Dr. rer. pol.
Kathleen Diener

We have undertaken a wide range of research activities in the field of mobile robotics and the impact of digital technology on organizational design and business competitiveness. The IfU was represented at various events.

At the UrbANT closing event, IfU and its project partners successfully demonstrated the automation and end-of-use function of a mobile delivery robot. With a presentation on autonomous systems as part of an innovation team, IfU was represented at an international conference on the importance of autonomy. In a lively discussion, the participants discussed the impact of autonomous decisions and how to ensure responsible behavior of semi-autonomous systems. The exchange was very stimulating and IfU was able to make many exciting contacts. In addition, IfU participated in a trade fair for elderly care and presented the DigiKomp Ambulant Sensor Mat. Visitors to the fair were able to experience the new technology for themselves right on the spot.



Christian Gülpen

In addition to our research activities, we have also taken a number of other initiatives this year. We have said goodbye to valued team members, welcomed new ones and elected the IfU Board. Prof. Sabina Jeschke and Prof. Klaus Henning are leaving the board. We would like to take this opportunity to thank them for their productive time together. We welcome Prof. Robert Schmitt as a new board member and look forward to an exciting future. The IfU has moved to a new location. You can now find the IfU with its BotCave at the following address:

Reumontstr. 48
52064 Aachen



Prof. Dr. rer. pol.
Frank T. Piller

All of these steps have helped to advance our joint institute and provide us with the means to continue our activities.

We would like to take this opportunity to recognize the hard work and dedication of our team members who made this year's progress possible. We would like to thank them for their tireless efforts and dedication to our cause.

We hope you will find this annual report informative and stimulating. We are proud of what we have accomplished this year and look forward to continuing our work in the future.

We look forward to an eventful and successful 2023 together! Cybernetic greetings, *your IfU Team*

Publicly funded research projects

"Cybernetics is the science of effective organization."
(Stafford Beer, neuropsychologist).



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DigiKomp Ambulant

The future of care Shaping together



Prof. Dr. rer. pol.
Kathleen Diener

Alexander Redlich,
M.Sc.



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The care sector is facing major challenges in view of the increase in the number of people in need of care, an above-average level of sick leave among employees and an increasing shortage of skilled workers. Physical and mental stress, as well as insufficient job satisfaction, also have a negative impact on caregivers' ability to work and jeopardize their retention in employment. The situation has also been significantly exacerbated by the Covid-19 pandemic. In order to secure the future of care in various care settings in Germany, innovative technical solutions should therefore contribute to maintaining the independence, self-determination and quality of life of those in need of care, as well as supporting and relieving the burden on care professionals and caregivers as well as family members.

The DigiKomp-Ambulant project, which started in July 2019, aims to develop new user-friendly solutions in close cooperation between developers and users and to enable needs-based support for outpatient care through innovative technology solutions. The starting point is the development of sensor technology that records the data (vital and movement data, etc.) considered essential by those in need of care, their relatives, the nursing staff and the doctors providing care. New networking software provides the basis for making important information available to caregivers even when they are not on site. In this way, ambulatory caregivers can gain competencies to deal confidently with people and technology: They are better prepared, can carry out upcoming activities in a targeted manner, and are in contact with everyone involved. This leaves more time for communication and relationship building through personal conversations. In this user-centered technology development process, IfU is particularly responsible for evaluating technology acceptance and user experience. The project was successfully completed in June 2022.

Project website: www.digikomp-ambulant.de

Contact: alexander.redlich@ifu.rwth-aachen.de

Project partners: St. Gereon, Franziskusheim, HTV Security GmbH, MA&T Project sponsors: IfU, nexus ag, KIT



Funded by: BMBF, ESF, EU, Together. Future. Design.



UrbANT

The urban, automated, user-oriented transport platform



Tobias Brünker,
M.Sc.



Christina Ionescu,
M.Sc.



Christoph Henke,
M.Sc.



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Many distances in cities can be covered comfortably by bicycle, on foot and by public transport. However, if large or heavy goods have to be transported, having your own car often seems indispensable.

The joint project UrbANT - Urban, Automated, User-Oriented Transport Platform - funded by the German Federal Ministry of Education and Research (BMBF) aims to develop, manufacture and test an individual, electrically driven micromobility vehicle that allows pedestrians in particular to carry heavy and large-volume goods safely and comfortably. On the one hand, the micromobility vehicle will be able to follow the user in an automated manner, but it will also offer the potential for fully automated use without a human driver.

Within the project, IfU is developing and integrating a follow-up function and autonomous navigation of the micromobile in urban environments. By means of the following function to be developed, the micromobile is to be enabled to follow a user automatically (e.g. carrying shopping home) and to actively avoid surrounding traffic. With the autonomous navigation function, the micromobile will be able to cover distances automatically without a user. The sensor technology used will enable it to fully detect its surroundings and, for example, detect obstacles such as people and avoid them. UrbANT achieved its goal at the end of the year and is thus considered to have been successfully completed.

Project website: www.urbant.de/de

Contact: tobias.mueller@ifu.rwth-aachen.de, christoph.henke@ifu.rwth-aachen.de

Project partners: DITF, BE POWER, BAST, easy2cool, Ford, IfU, ika, im, iTec, neomesh



Project sponsor: VDI|VDE-IT



Funded by: BMBF



DemoSens

Robot assisted disassembly of EV batteries for high quality recycling



Christina Ionescu,
M.Sc.

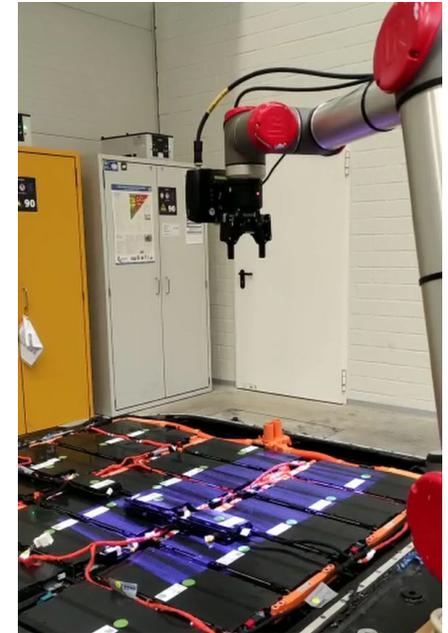
Konstantin Zähl,
M.Sc.

Christoph Henke,
M.Sc.



As part of the DemoSens project, the recycling of lithium-ion batteries from electric vehicles (hereinafter LIB) is to be comprehensively digitized and automated along the entire process chain from dismantling to sorting to mechanical reprocessing. Until now, the dismantling of LIB has been carried out manually and with a low dismantling depth (e.g. removal of the cable harness). Battery modules and cells that have been exposed and crushed for material separation are then processed using classical separation methods such as sifting and screening. A sub-area of the project is the construction of a pilot plant consisting of industrial robots equipped with suitable tools in order to automate the disassembly steps that have so far been carried out manually.

Within the DemoSens project, the Institute for Business Cybernetics (IfU) e.V. contributes its expertise in the areas of machine learning and adaptive robot systems. In the current state, a demonstrator setup consisting of robot, depth imaging camera and battery has been built. Using the point cloud of the depth camera and instance segmentation as well as other computer vision methods, the robot can automatically recognize the different components and their 6D pose (localization+orientation). This is then used to derive the robot pose for the respective disassembly operation. The setup is currently being tested for its positioning accuracy using a measuring mandrel; the final pilot system (industrial robot+tools) is currently being procured.



Project website: www.greenbatt-cluster.de/de/projekte/demosens

Contact: christina.ionescu@ifu.rwth-aachen.de

Project partners: Münster University of Applied Sciences, IfU, IME, IWARU, PEM Project executing organization: PtJ Supported by BMBF



Reinforcement Learning in Continuous Production Processes Using the Example of High-Modulus Fiber Tape Production

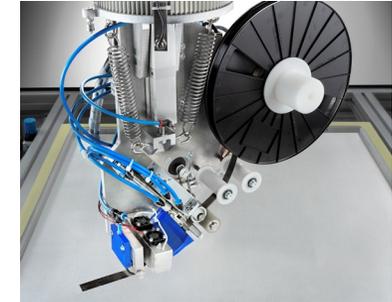


Christina Ionescu,
M.Sc.

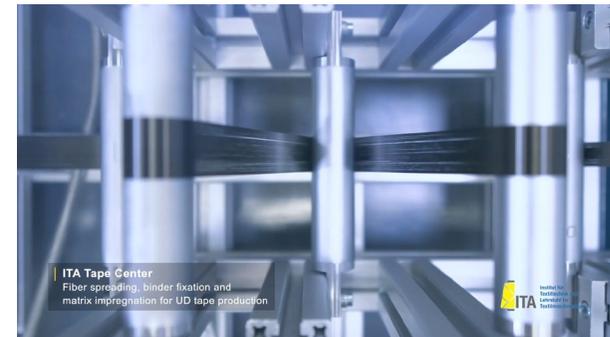
Christoph Henke,
M.Sc.



Motivation: Lightweight construction is considered one of the key technologies for reducing CO2 emissions. Compared to metallic lightweight materials, fiber-reinforced plastics have a higher potential for lightweight construction. However, high material prices and high labor costs due to manual manufacturing processes have so far prevented widespread use (especially outside the aviation industry). These deficits can be addressed by using spread tapes made of reinforcing fibers (e.g. carbon fibers), so-called tapes. In contrast to conventional semi-finished reinforcement products such as scrims or woven fabrics, tapes can be further processed in automated **tape laying (ATL)** with little waste.



The aim of the project is to further improve the width consistency of tapes in the spreading process. In addition, the robustness of the controlled spreading process with respect to disturbance variables is to be optimized and the commissioning times after a material change are to be shortened. To this end, additional sensor technology for recording the width will be integrated into the system. The width can thus be detected before and after each spreader bar. This allows the control to be implemented individually for each spreader bar.



Project website: <https://intelliline-aif.de/>

Contact: christina.ionescu@ifu.rwth-aachen.de

Project partner: ITA of RWTH Sponsored by: IGF, AIF



RaCPro

Development of a robot-assisted draping workstation for the production of components made of fiber-reinforced plastics



Konstantin Zähl, M.Sc.

Christoph Henke, M.Sc.

Motivation: The forming (draping) of bendable, sometimes sticky textile layers is a time-consuming and error-prone process that requires a lot of routine and a sensitive understanding of the material in order to avoid displacement of fibers and folds, holes or other types of errors. In SMEs, there are often not enough experts with this understanding of the material, which can lead to overload.

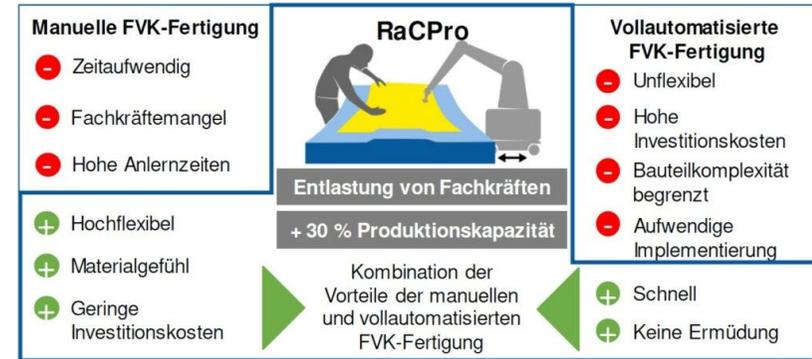
The aim of the project is to support skilled workers in the production of FRP components and increasing reproducibility and productivity through partial automation. With the introduction of imitation learning, the complexity of the programming effort is to be SMEs without years of expertise can use robots in their projects.

The kickoff meeting took place on 18.10.22 at the Institute of Textile Technology (ITA) in the presence of numerous representatives of the project monitoring committee took place. As part of the kickoff a design thinking workshop was held with the participants. Since the start of the project, several company visits have already been carried out for process analysis and the collection of interviews.

Project website: <https://racpro-aif.de/>

Contact: konstantin.zaehl@ifu.rwth-aachen.de

Project partners: ITA, IfU, IMA Project Management Agency: ITA Funded by: IGF, AIF



Institut für Unternehmenskybernetik



Bundesministerium für Wirtschaft und Klimaschutz

MASON

Design and evaluation of a mobile handling robot for location-independent order picking in the food industry



Tobias Brünker,
M.Sc.

Christoph Henke,
M.Sc.

David Schnermann,
M.Sc.



Motivation: The global transport of general cargo such as foodstuffs is usually carried out with the aid of standardized (deep-sea) containers. In order to keep logistics and freight costs as low as possible and to achieve the highest possible **packing density** in the container, the general cargo (packages) are not loaded onto pallets but stacked by hand in the container **without any carrier platform**. This approach eliminates the need for additional **load securing with straps or film wraps**, which would generate further costs and PVC waste. Today, however, the loading process without a pallet with a press fit of the packages against the container wall takes place purely manually and thus stands in stark contrast to the degree of automation in modern goods distribution centers. In these, even mixed pallets are already picked using modern gripper and **robot technology**.

Aim of the project: Automated, single-sort loading of deep-sea containers based on novel algorithms for grippers and also industrial robots with precise image- and AI-based **colli classification** as well as highly reliable **IoT communication** will sustainably avoid waste, save costs and improve the working conditions of logistics personnel while maintaining the packing density. Together with industry partners, a mobile robotics system is being developed and tested for this purpose.

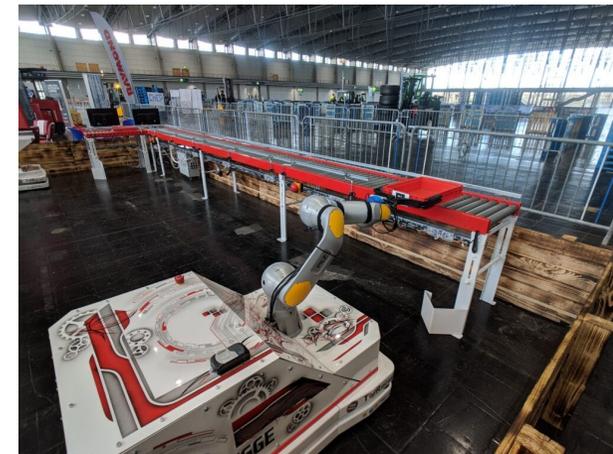
Project website: <https://mason-projekt.de/>

Contact: christoph.henke@ifu.rwth-aachen.de

Project partners: STS, IfU Project executing organization: IFL Funded by: IGF, AIF



Bundesministerium
für Wirtschaft
und Klimaschutz



PaiRS

Peer-to-peer exchange of digital competencies between companies in the StädteRegion Aachen



Prof. Dr. rer. pol.
Kathleen Diener

Alexander Redlich,
M.Sc.



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The networking of companies, processes, knowledge and competencies are crucial components for a successful digital transformation. In the Aachen city region, there is currently no formally regulated inter- and transdisciplinary knowledge exchange between companies, startups and institutions that makes it possible to share relevant experiences and promote digital skills among employees. This is where the joint project "PaiRS" comes in with the development of a pairing recommendation system.

The exchange of expertise between companies, startups and employees in the Aachen city region in the area of digitization is promoted with a digitization platform. The integrated recommendation system determines the digitization needs of employees and, based on this, brings them together with employees from other companies who have precisely the competencies, experience and knowledge of digitization that those seeking help lack. This drives the P2P exchange of employees from different companies and promotes learning opportunities for digitization projects. The personal, low-threshold exchange of experiences enables employees to overcome their fears and reservations about digitization. In order to reward companies for making their own individual competencies and experiences available to other members, an incentive and reward system is implemented in the PaiRS platform. Both sides benefit from the cooperation and expansion of their digital competencies and knowledge. The PaiRS platform is developed in the first iteration and is already being tested so that it can be released in 2023.

Project website: www.aachen.digital/pairs/

Contact: alexander.redlich@ifu.rwth-aachen.de

Project partners: DigitalHUB Aachen, Computer Science 5 RWTH Aachen, IfU



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Sponsored by: BMWK Unternehmen Rheinisches Revier



Events

"The fundamental principle of cybernetic thinking is the idea of circularity."
(Heinz von Förster, electrical engineer)



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UrbANT closing event



Project closing event for the project UrbANT "urban, automated, user-oriented transport platform" at the ika of RWTH Aachen University conducted.

Demonstration of the automation and end-of-use function in the project consortium.

On 30.11.2022, the official project closing event for the UrbANT project took place at the ika of RWTH Aachen University. Here, the developments and investigations of the participating project consortium of the past years were presented and demonstrated.

Within a demonstration scenario, the participants were able to experience the autonomous driving functions of the mobile delivery robot live and interact with it. If the participants stood in the way of the robot, it planned a path around them and automatically avoided obstacles. This was part of the presentation of one of the three systems, which included a parcel station for autonomous delivery of goods in urban areas.

In addition to the autonomous driving functions, the user-following function was also tested on site. Another so-called shopping set-up was used here, which enables the large-volume and refrigerated transport of goods, with the robot automatically following the person ahead and avoiding obstacles in the process.

We would like to thank the entire project consortium and project sponsor for the excellent cooperation and great results!

Contact: christoph.henke@ifu.rwth-aachen.de



Christoph Henke,
M.Sc.

Project kickoff RaCPro



Kickoff meeting for the RaCPro project "Development of a robot-assisted draping workstation for the production of components made of fiber-reinforced plastics" held at the ITA of RWTH Aachen University.

On 18.10.2022 the official project kickoff took place at the Institute of Textile Technology (ITA) of RWTH Aachen University together with numerous representatives of the project accompanying committee. In addition to the presentation of the project RaCPro - "Development of a robot-assisted draping workstation for the production of components made of fiber-reinforced plastics" and the contents of the research partners of the Institute of Textile Technology (ITA), the Institute for Information Management in Mechanical Engineering (IMA) of RWTH Aachen University and the Institute for Business Cybernetics e.V., a guided tour through the ITA pilot plant took place.

In the second part of the kick-off, the IMA conducted a design thinking workshop with the direct participation of the project committee. Within a SWOT analysis, the basic challenges of the automation of draping workplaces were worked out in groups, but also their chances and potentials. On this basis, personas were developed as exemplary users of the draping workplace in the following section. Finally, a first value proposition canvas was developed.

On behalf of the entire RaCPro team, we would like to thank all participants for their numerous and active participation and look forward to the start of the joint project!



Konstantin Zähl,
M.Sc.



Christoph Henke,
M.Sc.

Autonomy in the Digital Age: Rethinking Relationships between Humans, Technology and Society



International Conference of the Research Group "Autonomy and Autonomous Systems" of the Universities of Bonn & RWTH Aachen

On November 20-22, 2022, the conference "Autonomy in the Digital Age: Rethinking Relationships between Humans, Technology, and Society" took place at the University of Bonn. IfU was actively represented at this conference with a presentation on "Autonomous machines as members of innovation teams: Collaboration between human and machine intelligence in engineering, design and new product development".

An event whose focus was on stimulating conversations between disciplines. Philosophers, engineers, social scientists and humanities scholars discussed issues related to "autonomy and technology". The exchange opened up new perspectives. Keynote speakers included Karin Knorr Cetina (University of Chicago) and Lucy Suchman (University of Lancaster).

The IfU is currently involved in a research initiative that aims to explore the meaning of autonomous life in our digital societies; and which wants to question the humanistic concept of autonomy even in our technological reality and analyze the implications of our interaction with (semi-)autonomous systems. It is relevant to investigate how humans can interact with autonomous systems and which decisions can be delegated to them. The danger of a loss of control and the development of a technosphere that functions according to its own logic will also be discussed.



Konstantin Zähl,
M.Sc.



Prof. Dr. rer. pol.
Kathleen Diener



"Autonomy and autonomous systems"

Contact: kathleen.diener@ifu.rwth-aachen.de



Leading trade fair for geriatric care in Essen



DigiKomp-Ambulant booth and closing event at the geriatric care fair in Essen, Germany

From 26-28.04.2022 the leading fair for elderly care took place in Essen. Within the framework of the DigiKomp-Ambulant research project, the IfU also participated. As exhibitors at the fair, the project partners were able to jointly present the results of the successful research project to the public: The DigiKomp Ambulant Sensor Mat. Visitors to the trade fair were able to experience the new technology for the simple recording of vital signs in outpatient care for themselves and lay down on a nursing bed with the sensor mat installed. The vital signs were then recorded live on a large screen. This generated a great deal of interest and many visitors came to the stand to find out more about DigiKomp-Ambulant.

The focus of the DigiKomp-Ambulant project was in particular to develop innovations for solving problems not only for, but above all together with ambulatory caregivers in a targeted manner and thus to ensure their acceptance. It was therefore particularly exciting and gratifying that the trade audience at the trade fair was not only enthusiastic about the project, but also expressed interest in many other fields of application that extend far beyond outpatient care.

The DigiKomp-Ambulant final event also took place during the trade fair, where Alexander Redlich from IfU gave a presentation on the topic of "Factors influencing nursing staff's intention to use digital technologies". The crowds and the interest in the research results of DigiKomp-Ambulant were great and so the IfU was able to make many exciting contacts and impart knowledge about technology acceptance and usage intention in elderly care.

Contact: alexander.redlich@ifu.rwth-aachen.de



Alexander Redlich,
M.Sc.

Images and graphics: Institute for Business Cybernetics e.V.

Open and User Innovation Conference



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The IfU participates with the RWTH Institute for Technology and Innovation Management in the 19th edition of the international OUI Conference.

The central role of customers and users as initiators and contributors in the innovation process was first postulated by MIT professor Eric von Hippel (Hippel 1978) with the so-called "customer-active paradigm". Many users carry out independent development activities, which often result in highly innovative solutions. Of particular importance is the fact that users not only create solutions for their own use, but also pass them on to third parties, usually free of charge. Such innovation behavior differs significantly from the behavior within the framework of the traditional supplier-driven innovation paradigm.



An interdisciplinary research community has formed around Eric von Hippel, the **Open and User Innovation Society**, with the common interest of integrating the phenomenon of user innovation into the traditional innovation literature. Researchers from various disciplines (e.g., innovation management, strategic management, organizational design, marketing, intellectual property rights management, entrepreneurship, and public policy) meet annually to share current research findings and plans related to open and user innovation.

ETH zürich

In this year's edition, the OUI Conference was hosted by the Chair of Strategic Management and Innovation at ETH Zurich. Due to the ongoing challenges posed by the Covid 19 pandemic, OUI2022 was again streamed virtually from June 20-21, 2022. Last year, IfU hosted and organized the OUI Conference itself together with the RWTH Institute for Technology and Innovation Management (TIM).

IfU was represented again this year, with Prof. Frank Piller chairing the plenary session on "Open Source Frontiers" and Alexander Redlich presenting a research concept on digital ecosystems and platforms. The exchange with the best innovation researchers from all over the world led to inspiring technical discussions and networking with many old acquaintances and also new contacts. IfU would like to thank the OUI Society and ETH Zurich for hosting the event.



Alexander Redlich,
M.Sc.

We are already looking forward to next year's OUI edition!

Contact: alexander.redlich@ifu.rwth-aachen.de

Science Communication

"Cybernetics is the epistemology concerned with the generation of knowledge through communication."
(Gordon Pask, psychologist)



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Christoph Henke,
M.Sc.

Christina Ionescu,
M.Sc.



Robotics AG with the Academy of German Cooperatives

Science communication for employees of Volksbank Friedrichshafen-Tettngang based on current research topics and our Oscars - the mobile autonomous service robots.

On October 21, 2022, a robotics course was held with employees of Volksbank Friedrichshafen-Tettngang as part of the established cooperation between ADG (Academy of German Cooperatives) and TIM-RWTH.

At the beginning, the IfU presented its current research topics such as UrbANT or DemoSens. The respective issues, potentials and relevance for the economy were then discussed together with the participants from different perspectives.

This was followed by a hands-on experience section: robots to touch, experience and steer yourself. Using the example of Oscar - IfU's specially developed learning platform - the basics of mobile autonomous robotics were demonstrated. The participants were able to inspect the platforms in teams, steer them themselves and understand how a mobile robot perceives the world. In the third part, there was initially a theoretical insight into the developments and the functional principle of Deep Learning using the example of computer vision. Afterwards, the participants were able to immerse themselves in the work of a scientific employee at IfU. Afterwards, the participants were able to immerse themselves in the work of a research assistant at IfU and use open source code, install packages and use them to realize object detection via their webcam.

Contact: christoph.henke@ifu.rwth-aachen.de

Project partner: TIM



Seminar on Artificial Intelligence and Autonomous Robotics



Christoph Henke, M.Sc.

Christina Ionescu, M.Sc.



Guest lecture of the IfU for the German Armed Forces Command

Seminar on Artificial Intelligence and Autonomous Robotics at the Biggese Academy in Attendorn, Germany

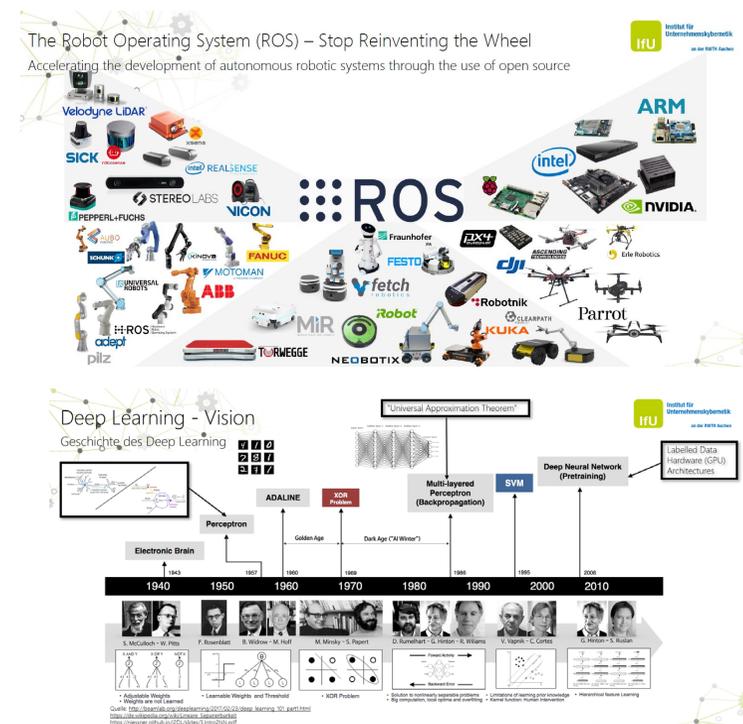
In April 2022, the IfU was represented with a guest lecture at the Biggese Academy. The Academy Biggese is a member of the Network for Political Education in the German Armed Forces and offers seminars lasting several days for military and civilian members of the German Armed Forces. Here, lectures are held on a wide variety of topics, such as globalization or dealing with media and their contents, and many more.

First, the IfU gave an overview of the current research topics at the institute and then presented the Robot Operating System (ROS) as the de facto standard for the development of autonomous systems. After a presentation of sensor systems, environment perception and kinematics of mobile autonomous robot systems, our exhibit Oscar was used again.

In another part, there was an introduction and deep dive into artificial intelligence and deep learning based on computer vision. Here, both a theoretical overview of the developments in research as well as application examples and the latest gadgets in our everyday life were addressed and discussed with the participants.

IfU enjoyed the exchange with the very interested participants and events in a similar format are planned for the future.

Contact: christoph.henke@ifu.rwth-aachen.de



The Institut für Unternehmenskybernetik e.V. participates in the teaching program of the RWTH Aachen University by offering the lecture *Robotics and Multiagent Systems* in the course Cybernetics for Engineers I. Here we teach students the basics of distributed artificial intelligence and robotics.

Cybernetics for Engineers I - Robotics and Multiagent Systems

Located in the bachelor program of mechanical engineering and industrial engineering at RWTH Aachen University and lead-managed by the Chair of Information Management in Mechanical Engineering (IMA), the lecture "Cybernetics for Engineers I" imparts knowledge in general, biological and technical cybernetics. In addition to the theoretical input from exciting lectures on topics such as bionics, neuroscience or artificial intelligence, students also apply the methods they have learned to current research topics and develop holistic approaches to solutions in teamwork.

Within the lecture *Robotics and Multiagent Systems*, students are taught the properties and dynamics as well as models of distributed artificial intelligence, starting from bionics to swarm intelligence. Based on the example of the Sense-Think-Act cycle, a structural introduction of autonomous robot systems is given. In this context, autonomous systems perceive their environment on the basis of sensor systems, convert this into an environment representation suitable for decision-making and derive decisions (actuators). The lecture leads through the basics of state estimation, heterogeneous sensor systems and robot kinematics, as well as environment mapping and path planning.

Based on this, the unit topic on the use of model predictive control for mobile packaging was carried out. Mobile manipulators are robot systems, which consist of a combination of a mobile robot and a multi-axis robot arm. These systems have the potential to perform location-independent handling tasks in both industrial and service robotics applications. However, the control of these systems is highly complex and control methods are needed that provide efficient control within the high-dimensional and redundant state space. Model predictive control is a class of methods that allows to integrate system constraints, external constraints (obstacles), the kinematic model of the system and to optimize trajectory planning with respect to a cost function.

Contact: christoph.henke@ifu.rwth-aachen.de



Practical example of 3D environment mapping using low-cost hardware



Christoph Henke,
M.Sc.

People at IfU

"Cybernetics is the epistemology concerned with the generation of knowledge through communication."
(Gordon Pask, psychologist)



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Board of Directors & Scientific Management



The IfU Executive Board, in close consultation with the Scientific Board of Trustees and the Management Board, steers the work of the institute. He is responsible for the affairs of the association and is elected every three years at the general meeting.



Dipl.-Ing. Michael Bernas

Member of the Executive Board

Head of Research Production Systems,
Festo AG & Co. KG, Esslingen



Prof. Dr. rer. pol. Frank Piller

Scientific Director and Vice Chairman of the Board

Professor and Co-Director,
Institute for Technology and
Innovation Management at
RWTH Aachen University



Dr.-Ing. Christian Jacobi

Member of the Executive Board

Managing Director of Agiplan GmbH,
Mülheim an der Ruhr



Prof. Dr.-Ing. Robert Schmitt

Member of the Executive Board

Chair of Production Metrology and Quality
Management of the WZL & Information
Management in Mechanical Engineering (IMA)

The IfU Board of Trustees

The members have elected their new IfU Board of Trustees. The board of trustees supports the scientific work of the IfU especially in the areas of business cybernetics and mobile robotics.



Doris Aschenbrenner



Dieter Begaß



Maren Bennewitz



Paul Flachskampf



Thomas Gries
stellv. Vorsitzender



Eckart Hauck



Christiane Michulitz



Herbert Nöckel



Gerald Pörschmann



Astrid Rosenthal-von
der Pütten



Sigrid Brell-Cokcan



Karl Schultheis



Markus Schwaninger



Jean Severijns



René Vossen
Vorsitzender

New employees:inside



David
Schnermann



since november
2022



Research associate at IfU in
mobile robotics

07/2022



M. Sc. in Development and Design
at the RWTH Aachen

07/2019-
05/2021



Student Assistant at the MSE of RWTH
Aachen University
Focus on automation of construction
machinery

08/2019



B. Sc. in Mechanical Engineering with
focus on development and design
at the RWTH Aachen

Our new IfU home

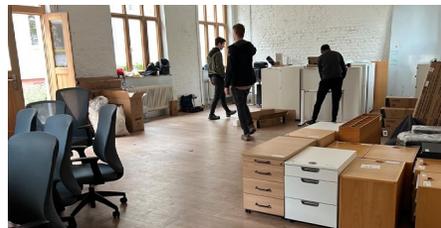
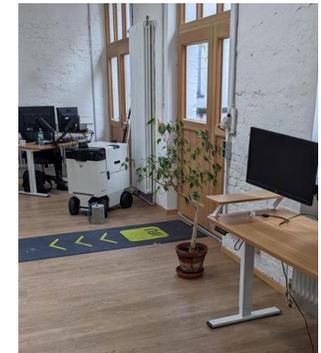


Packing boxes and disassembling bots. Our move out in the TZA. A long time of WG of IMA and IfU ends.

It was a great time that we will always remember fondly.



Arrive and build up.



We are settling in. First Christmas party in the new four walls.

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