



November 13th, 2023 | 09:00 am

Schloss Seggau | Seggauberg 1 | 8430 Leibnitz | Austria

„ROBOTICS & AUTOMATION: INNOVATIONS FOR A SUSTAINABLE INDUSTRY!“

European Robotics and Automation Talks (ERAT) 2023

About Us



*As an **ASSOCIATION FOR AUTOMATION TECHNOLOGIES**, **AT STYRIA** brings together companies, research facilities and educational institutions. Automation is an extensive field resulting in the diversity of our members. They range from single person businesses for large enterprises including all levels of expertise and education.*

***AUTOMATION, DIGITIZATION AND CONNECTIVITY** will be the central factors in enabling innovation and remaining internationally competitive as a business location. Due to the wide range of technologies, cooperation is required for sustainable success in this area.*

*With almost 125 members our network employs over 55.000 people, providing products and services around the world. Together we hold extensive knowledge in **ELECTRONICS, MECHANICAL ENGINEERING, AND INFORMATION TECHNOLOGIES**, which guarantees the effective execution of projects in a fast growing and technology driven area.*

GMAR

***GMAR** is the Austrian platform for measurement, automation and robotics. In bringing together stakeholders such as scientific institutions, universities, producers, system integrators, and users the GMAR Network has become an important national and European focal point.*

Automation and robotics are essential technologies driving the sustainable economic growth in Austria. Due to our cooperation with our partners in all Austrian States, and various European countries we are connecting rather successfully e.g. science with industry, industry with industry in all fields of automation & robotics & measurement.

***GMAR** is supported by the Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology, and under the patronage of the Austrian Association for Electrical Engineering ("OVE").*

Keynote



Mag. Patricia Neumann
Siemens AG Austria

How Technology drives Sustainable Transformation

Siemens strategy is shaped to address the big challenges like climate change or demographic change.

Combining the real and digital world, acting globally and locally are the drivers for sustainable growth – for society and companies.

Speaker



Mag. Ulrike Haslauer
compact electric

ESG: Environmental, social and governance !

Risk or business opportunity? How can automation support ?

The new regulation and impact on real estate.

Possible solutions and impact on our industries.

To be able to set meaningful reduction, optimization, and regulation measures, it takes more than just the data from the annual energy bill. It requires a detailed recording and analysis of KPIs (Key Performance Indicators) to determine the current state and any potential for savings and optimization.

The introduction of ESG criteria and rankings is intended to promote sustainable finance.

In the real estate industry, one of the main consumers of energy and responsible for around 40% of CO2 emissions, there is great potential for savings, especially with the planned CO2 tax in mind. The value of a property is also related to its sustainability and environmental friendliness, as an “environmentally harmful” property is more difficult to rent out than a “green” one.

Let me invite you to have a look, how a new project is built obeying ESC circumstances. Central Hub as best practice for ESG is one of the biggest projects of compact electric, a new Office Park fulfilling ESG standards.

We took the chance to grow in a new business market ESG.

Speaker



Univ.-Prof. Dipl.-Ing. Dr.techn. Franz Haas

TU Graz

Innovations and advances in the field of robotic drive systems

Manufacturing technology is currently being transformed in many areas, with robotics playing a central role in research at the Institute of Production Engineering at TU Graz beside precision manufacturing, 3D printing and production for e-mobility. In line with this momentum, many new challenges (e.g. energy efficiency) are emerging, which primarily affect robotics drive technology. The talk will therefore provide an overview of the latest developments in robot drive systems and link them to current requirements in production. The focus will then be on specific system solutions. A detailed analysis of the requirements is beneficial in the selection of drive motors, gearboxes and encoders. In the second part, a totally new gearbox principle is presented that does not require revolving gears. Power is transmitted via guided piston segments with an integrated special tooth design, driven by a crankshaft and geared to an internally toothed hollow part. The simultaneous meshing of several teeth increases the transmitted torque and the system stiffness, allowing compact and precise power transmission solutions for the robots of the future.

Speaker



Ladislav Dvorak

RoboTwin s.r.o.

EIT Manufacturing Best Practice: Easy robot teaching using motion tracking

RoboTwin introduces no-code robotics to manufacturing, enabling workers to teach robots directly. The system records a worker's demonstration of a task on the first product, generates a robot program, and allows the robot to complete the rest of the production series. This approach simplifies and accelerates the teaching process for industrial robots like spray painting and grinding, eliminating the need for a dedicated robot programmer.

Speaker



Univ.-Prof. Dr. Markus Fallenböck

University of Graz

Machine Data and AI: Who ist the creator? Who gets the money?

The lack of restrictions under data protection law raises the question of legal positions and thus of security between the companies involved, especially in the case of (machine-generated) B2B data. These companies can only invest in the expansion of this business if there is legal certainty about the power of disposal and its economic exploitation. In view of the fact that there are currently more than 35 billion networked devices and a global market volume of more than 200 billion dollars, questions need to be resolved in the area of intellectual property law and the protection of trade secrets (know-how protection).

AI - who "owns" the data and results?

AI will drive the increase of machine data. Using this as an example, this presentation deals with the legal power of disposal over the data produced in the process. The following questions will be addressed: Who is the creator? Is copyright protection possible? Which other protections and rights are possible? What happens with the basic data? Etc...



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„ROBOTICS & AUTOMATION: INNOVATIONS FOR A SUSTAINABLE INDUSTRY!“

European Robotics and Automation Talks (ERAT) 2023

The Association of Automation Technologies Styria and GMAR have joined forces in order to establish a new conference - **EUROPEAN ROBOTICS AND AUTOMATION TALKS** - dedicated to trending topics in Automation and Robotics.

Our goal is to connect **PRODUCERS, USERS, DEVELOPERS & SYSTEMINTEGRATORS** from Austria and various other European Countries. At this year's ERAT one will not only have the possibility to listen to **NEW SOLUTIONS MADE IN EUROPE** but also have the opportunity to network with participants such as producers, system integrators, users (SME & Large Enterprises), potential users, and scientists.

Welcoming

08:45 am Peter Reichel, OVE/GMAR
Helmüt Röck, AT Styria
Alexander Pogany, BMK
Alexander Numrich, GMAR

08:55 am „Welcome Note“

Keynote

09:00 am Mag. Patricia Neumann, CEO Siemens AG Austria

Lectures

09:30 am Mag. Ulrike Haslauer, compact electric

09:55 am Franz Haas, TU Graz



AT STYRIA
Plattform Automatisierungstechnik

GMAR

B2B

10:25 - 11:10 am Exhibitor time and Networking

Parallelsessions A & B

11:10 am

Session A:

„Building a Greener Future: Exploring the Sustainability Aspects of Additive Manufacturing“

Session B:

„Automated Navigation in Challenging Unstructured Environments“

Lunch

12:30 - 13:15 pm Buffet

Lectures

13:15 pm

Ladislav Dvorak, RoboTwin s.r.o.

Parallelsessions C & D

13:30 pm

Session C:

„Industrial Automation“

Session D:

„Sensor Systems and Sensing Technologies in Robotics“

B2B

14:50 - 16:00 pm Exhibitor time with hands-on and networking



AT STYRIA
Plattform Automatisierungstechnik

GMAR

Afternoon

- ▶ 16:00 pm Ruth Aigner
- ▶ 16:05 pm Innovation 1
- ▶ 16:15 pm Innovation 2
- ▶ 16:25 pm Innovation 3
- ▶ 16:35 pm Univ.-Prof. Dr. Markus Fallenböck, University of Graz
- ▶ 17:00 pm Coffee break

Parallelsessions E & F

- ▶ 17:10 pm Session E:
„Autonomous mobile systems in logistics“

Session F:
„Safety Aspects and Standardization in Collaborative Robotics“

Final

- ▶ 18:35 pm Closing Ceremony
- ▶ 18:45 pm Dinner



Parallelsession A

Building a Greener Future: Exploring the Sustainability Aspects of Additive Manufacturing

MODERATION: FH-Prof. Dr. Mathias Brandstötter

Professorship for Robotics and Mechatronic Systems and Head of the ADMiRE Research Center



This session critically examines the confluence of sustainability and additive manufacturing, providing valuable insights into the role of additive manufacturing in fostering a greener future. The session endeavours to elucidate the environmental ramifications of additive manufacturing, including its impact on the environment, material efficiency, waste reduction, energy consumption, and carbon footprint. Furthermore, it explores cutting-edge sustainability practices, materials, and technologies within the realm of additive manufacturing, unveiling the manifold opportunities and challenges that arise in the quest for a more sustainable and ecologically conscious future. By bringing together multidisciplinary perspectives, this session aims to deepen our understanding of the potential of additive manufacturing as a transformative force for sustainable development.

TALK 1: Promoting Sustainable Regional Development through Additive Manufacturing: A SI AT Cross-Border Initiative for a Resilient and Circular Economy

We introduce AddCircles, a project aimed at empowering regional businesses through Additive Manufacturing (AM). This cutting-edge technology perfectly suits our region, allowing us to create high-value, sustainable products. AddCircles' main goal is to transition our region into a resilient and circular economy by improving resource efficiency in manufacturing, promoting recycling, and using natural materials. This will be achieved through collaborative networks spanning various value chains and two knowledge-sharing pilot projects. It is a transformative initiative for our region, harnessing AM's potential for sustainable growth. Join us at the talk to learn how you can be part of this exciting journey!



Maja Mešl,
FTPO, Slovenia

Parallelsession A

Building a Greener Future: Exploring the Sustainability Aspects of Additive Manufacturing

TALK 2: Product Carbon Footprint of Parts Fabricated by Material Extrusion

The importance of the product carbon footprint is growing fast in industrial procurement. Reasons for that are regulations, market pull and increasing carbon taxes. This talk is about the carbon footprint of 3D-printed plastic parts by material extrusion. Different approaches and scenarios are presented and results are discussed.



Matthias Katschnig,
Hage3D

TALK 3: Lightweight Biobased Composites for Improved Functionality by Additive Manufacturing

With a strategic vision for the years ahead, ALPEX Technologies GmbH has outlined one of its three key priorities as pioneering research and development in BIO composite component technologies. Acknowledging the increasing global demand for sustainability across diverse markets, ALPEX is committed to addressing this imperative. As a specialized equipment manufacturer focused on tooling for composites, ALPEX is dedicated to facilitating the transition towards more sustainable materials and manufacturing technologies. By aligning its endeavors with the surging interest in bio-based materials, ALPEX not only ensures its relevance in the industry but also positions itself to meet the evolving market requirements and play a pivotal role in advancing eco-friendly manufacturing practices. In the upcoming presentation, ALPEX will showcase its substantial achievements in the BIO composite component technology field and provide a comprehensive overview of prevailing market demands and emerging sustainability trends.



David Kampenhuber,
AlpeX Technologies



Chethan Savandaiah,
Wood K plus

Parallelsession A

Building a Greener Future: Exploring the Sustainability Aspects of Additive Manufacturing

TALK 4: METALS IN BIOMEDICAL ADDITIVE MANUFACTURING APPLICATIONS

Metals in additive manufacturing applications are an increasingly important area in both research and industrial production of complex shaped parts. In medicine, the use of metals can be traced far back in history, when gold was the first metal used to restore teeth.

With the advent of AM technologies, many new opportunities opened up for the production of customized medical products and bespoke implants. Therefore, it is not surprising that most of the metals researched and produced for use in the AM industry are metals mainly used in medical products, such as Ti-6Al-4V, AISI 316L, Co-Cr, Ti cp, Ta, Mg and so on. The production of metal powders for use in PBF and DED applications is far from sustainable unless it is done on a large scale in base metal factories, such as steel mills. Nevertheless, the use of the powder material in AM machines brings benefits that exceed the energy and resource losses associated with powder production, so the sustainability of the process should be considered in the overall context of production. To evaluate the sustainability of metal AM processes, we need to consider several important factors, the most important of which are the shape complexity of the parts and the ability to produce parts with functionally graded microstructure.



Igor Drstvenšek,
University of Maribor, Slovenia

Parallelsession B

Automated Navigation in Challenging Unstructured Environments

MODERATION: Assoc.Prof. Dr. Gerald Steinbauer-Wagner

Associate Professor at the Institute for Software Technology at the Graz University of Technology



The automation of the navigation of robots and vehicle in challenging unstructured environments such as offroad areas, remote alpine regions, forests, mines, or disaster sites will be the basis for interesting use cases such as inspection of protection structures, support of mountain rescuers, forestry, agriculture in remote areas, or mining. Besides the potential in applications such type of navigation posts a number of challenges such as lack of detailed maps, difficulties in understanding rich complex environments, controlling vehicles in complex uneven terrain. In this session we will have brief motivating presentations of companies and research organizations working in the area of offroad navigation. The presentations re followed by a moderated Q&A session with all participants.

TALK 1: Offroad Navigation of Utility Vehicles (tentative)



Prof. Dr. Karsten Berns,
University of Kaiserslautern

Parallelsession B

Automated Navigation in Challenging Unstructured Environments

TALK 2: Autonomous Navigation of Ground Vehicles in Subterranean and Field Environments

In the talk, selected autonomous navigation solutions developed in the Computational Robotics Laboratory will be presented. The lab is a part of the Artificial Intelligence Center and Center for Robotics and Autonomous Systems at the Czech Technical University in Prague, Czechia. Within the lab, we address robotic information gathering with ground robotic platforms such as multi-legged and wheeled platforms. The talk focuses on deployments in subterranean terrains and field environments where relying on a global navigation satellite system is impossible. The talk will present results from autonomous system deployment motivated by the DARPA Subterranean Challenge (SubT) and the achievements of the CTU-CRAS-NORLAB team. Furthermore, recent deployments in data collection scenarios for communication signal propagation will be presented. Finally, results on autonomous navigation using geometry-based terrain assessment will be shown for a vehicle from 300 kg to 3000 kg weight category.



Prof. Jan Faigl,
Czech Technical University in Prague

TALK 3: Navigation in underground mining and tunnelling applications - Demands and current state of the art!

Similar to many other technical operations, mining and tunnelling application are striving to develop their operation towards autonomous systems. Main drivers are increased safety - by keeping people out of hazardous areas – and improvement of the operation's reliability and performance in general. Autonomous navigation is a key component for such a successful setup. Nevertheless, the constraints are special: Operation below the surface, dark and dusty environment, vibrating machine structures and in many cases the need for ATEX-certified equipment are big challenges to establish a successful navigation solution. The presentation will figure out possible concepts, their technical limitations and experience so far.



Hubert Kargl,
Sandvik Mining and Construction G.m.b.H.

Parallelsession B

Automated Navigation in Challenging Unstructured Environments

TALK 4: Challenges of dual use approach in off-road applications

In the last years a rapid increase in requests for UGVs with off-road autonomous navigation capabilities in both the military and civilian domains has been registered. Due to their peculiar requirements, these sectors require innovations, new approaches and tailored solutions to the problem of autonomous driving.

In this talk, IDV will give an insight on the common challenges and their possible solutions to tackle the new problems coming from the intricate world of off-road autonomous driving. While autonomous vehicles have made significant strides on urban roads, the unpredictable and harsh terrains encountered in off-highway applications pose a unique set of challenges on the hardware, the software, and the legislative and homologation processes. Moreover, integrating these technologies into on-field military missions demands a further step towards the understanding of the rules driving such domain.

Dual-use technologies or commercial off-the-shelf (COTS) systems are crucial to the successful development of robotic systems. Leveraging onto fast advances of tested and proven COTS technologies on both electronics, computing, software and hardware helps reducing the risks associated with development.

As IDV navigates through these challenges, the goal is to examine how can be possible to perform the technology transfer from the civilian to the military sector and on which sublevels, exposing the need for dual-use autonomous driving technologies.



Ivan Enzo Gargano,
IDV, Italy

Parallelsession C

Industrial Automation

MODERATION: FH-Prof. DI Dr.techn. Udo Traussnigg

CAMPUS 02 University of Applied Sciences, Head of Department Automation Technology



In a wide variety of industries, automation is a key driver for innovating products, optimizing processes and perfecting production.

Different objectives such as functionality, costs, time, quality, resources, environment etc. can be the focus.

Due to the constant integration of new technologies, both traditional companies and young start-ups are represented in the scene, which is also shown in this session.

The session reports on the challenges that arise in practice due to the often existing and restrictive framework conditions, how even large companies benefit from cooperation and how young, dynamic companies manage to open up new perspectives through new technologies.

Talk 1: Making industrial complexity visible

EXARON is a technical simulation office specializing in the visualization of complex industrial processes. For this purpose, leading simulation software in factory and production planning is used and combined with industry-standard extended reality (XR) technologies. The digital models created in this way can be visualized realistically and location-independent as well as tested, manipulated, optimized and learned quickly and flexibly – without wasting resources, polluting the environment and endangering people.



Thomas Kaufmann,
EXARON GmbH



Patrick Gröller,
EXARON GmbH

Talk 2: Redefining the status quo in programming

Selmo, Sequence Logic Modeling, rethinks machine programming. As a real alternative to manual programming, Selmo offers a programming standard that creates a universally uniform structure in the operating and programming of machines. For the first time, a uniform operating system for machines is possible, constantly informing about all processes in real-time and ensuring that the machines operate with maximum availability. Selmo stands for the controlled digitization and automation of logical production processes.



DI DI (FH) Markus Gruber,
Selmo Technology GmbH

TALK 3: PC-based Control with Metris X

Automation and Digitalization plays a tremendous important role in making IoT in an industrial context possible. METRIS X (by ANDRITZ) as an unique platform to cover both automation and digitalization hemispheres for various industries and a powerful and scalable hardware (by BECKHOFF) is the key to help our customer to meet their business requirements.



Gerhard Schiefer,
ANDRITZ AG



Ing. Walter Eichner, MBA,
BECKHOFF Automation GmbH

TALK 4: Overview of different solutions from standard products and individual customer solutions

Procedure and the road from layout in reality, Customized solutions depending on the production area and customer capacities, Implementing customer requirements based on continually highly expectation.



Dr. Florin Sabou,
NEOTRONIK AUTOMATION SRL

Parallelsession D

Sensor Systems and Sensing Technologies in Robotics

MODERATION: Univ.-Prof. Dipl.-Ing. Dr. Hubert Zangl

Professor for Sensors and Actuators, Institute of Smart Systems Technology, Alpen-Adria-University Klagenfurt



The autonomous physical interaction of machines and robots with unknown objects and especially also with humans in unstructured environments remains a major challenge. Sensors and accurate sensing of the environment will play an essential role in solving these challenges. The applications are wide-ranging, from automation in industrial and domestic environments such as logistics, autonomous driving, building automation, and the Internet of Things, to the health sector with applications in assisted living, care, and the medical field.

In addition to the provision of data by means of sensors, also sensor signal processing and the understanding of sensor data are highly relevant and need to be considered together with the sensors themselves. Classical methods often reach their limits with the large number of input variables recorded as well as the complex interactions, so AI methods are used. AI with all its areas from perceiving and understanding the environment, planning movements and understanding, predicting and reacting to the commands of humans is a core component of every robot as well as many automation systems.

In order to fully utilize the capabilities of the approaches, accurate simulations of sensors in the application scenarios are of interest. The session will address these various aspects of sensor systems and sensing technologies in robotics.

TALK 1: Intelligent Sensor Systems for Piece Picking Robots

The robots are coming. The need of industrial robots and cobots in intralogistics paired with high-end sensor systems is becoming higher and higher. While the mechatronic systems are state-of-the-art, in the future it will be more necessary to use smart sensor-systems, AI and intelligent software. This talk gives you some answers to the “why” and a compact overview of the the robotics world in TGW.



Martin Tiefenbrunner,
TGW

Parallelsession D

Sensor Systems and Sensing Technologies in Robotics

TALK 2: Extrinsic Calibration of a Multiple Radar System for Proximity Perception in Robotics

The simultaneous use of multiple small and low-cost radars has recently become feasible due to their increasing availability and functionality. Calibrating a radar-only system is particularly challenging when dealing with devices having low number of antennas and therefore limited angular resolution; such setup is though beneficial for collaborative and safety-oriented applications in robotics. We present an extrinsic calibration method for a multi-radar system deployed in a robotic cell. The calibration procedure only requires to move a single radar-signal reflector within the perceived area. The method is based on data sequential collection and pre-processing, combined with the closed-form registration of 3D point clouds and uncertainty analysis.



Barnaba Ubezio,
AAU

TALK 3: Highly accurate stereo visual odometry for the city and racetrack

Localization constitutes a fundamental building block of any autonomous system. This is especially emphasized for autonomous vehicles that participate in urban traffic and need to maintain highly accurate estimates of their pose for navigation purposes. But besides urban traffic, autonomous vehicles are also making their way to the racetrack, which presents novel challenges - although not plagued by dynamic objects, the scene is often low in texture, visually similar across the track, and captured with velocities above 200 km/h. In this talk we will present a stereo visual odometry solution, dubbed SOFT2, which has been for the past years the most accurate localization algorithm on the KITTI dataset, and its version adapted for rolling shutter cameras and the racetrack.



Ivan Markovic,
FER

Parallelsession D

Sensor Systems and Sensing Technologies in Robotics

TALK 4: Time-of-Flight imaging for 3D sensing in robotics

As the number of robots is increasing in all the different markets the demand for more intelligent robotic systems that can act autonomously increases as well. Hence, also the need for interaction between humans and robots is getting more important. At Infineon we are developing 3D image time-of-flight (ToF) sensors that are capable to provide more detailed and more accurate information on the robot's surrounding enabling more sophisticated robotic applications for industrial as well as for consumer markets.

This talk will introduce 3D sensing with ToF image sensors and will show on how to use it in selected robotic applications (e.g. SLAM and obstacle avoidance).



Armin Berger,
Infineon

Parallelsession E

Autonomous mobile systems in logistics

MODERATION: Alexander Numrich

Robot 01, GMAR Network



Automated guided vehicles (AGVs) and autonomous mobile robots (AMRs) are tools to optimize productivity by automating the transportation of various materials.

Both systems do have the same challenge: materials in a warehouse need to be transported from/to A-B-C-D. AGVs and AMRs are equipped rather differently.

Understanding the advantages of both solutions is crucial: the pros and cons are depending on the areas of use.

The session “Autonomous mobile systems in logistics” will be focusing on advanced industrial solutions.

TALK 1: Accelerated AMR development through multipurpose simulation

A rapidly growing market presents manufacturers of autonomous mobile robots (AMR) like AGILOX with a difficult challenge: How can new products and functions be implemented and tested quickly and efficiently while meeting the diverse requirements of customers? Simulation environments and toolchains, which are increasingly being used to create digital twins in the intralogistics domain, play an important role here. They can be utilized for many tasks including testing of system components in recreated scenarios, virtual commissioning in greenfield and brownfield applications, as well as the generation of synthetic training data for machine learning methods. For AGILOX, the NVIDIA Isaac simulation environment has proven to be a solution that can fulfill all these purposes.



Wolfgang Pointner,
AGILOX Services GmbH

Parallelsession E

Autonomous mobile systems in logistics

TALK 2: AMR secure the production of the future

In times of labor shortage, companies struggle to keep up or extend their production capacities. Automation becomes a key factor to not only be prepared for the future, but also to secure the current state of companies. Autonomous mobile robots represent a flexible, simple and affordable solution for challenges like labor shortage, varying throughputs and changing processes and are the answer to prepare a company for all challenges which lie ahead.



Mag. Gregor Schubert-Lebernegg,
KNAPP Industry Solutions GmbH

TALK 3: 3D Vision in Robotics for Flexible logistics

3D Vision is an enabling factor in Robotics. Specifically it increases robotic platforms' perception capabilities. Logistics applications can benefit from augmented perception of Pallet/Load Localization & Shape estimation in order to make the whole workflow more efficient and flexible. In this talk I'll focus on 3D technologies and applications for automatic pallet identification, localization and picking in large warehouses and automatic truck loading.



Mariolino De Cecco,
University of Trento, Italy

TALK 4: Panel Discussion

Parallelsession F

Safety Aspects and Standardization in Collaborative Robotics

MODERATION: Dipl.-Ing. Dr. techn. Michael Rathmair

Deputy Director of the Institute, Research Group Leader Industrial Robot System Technologies



When humans and robots work together in fenceless applications, the safety requirements for the operating personnel receive the highest priority. The newly published Machinery Regulation and the revised standard ISO 10218 form the basis for the safety assessment of collaborative robot applications, taking into account state-of-the-art robotics technologies. In the session, requirements will be discussed from various practical points of view and best practices will be developed in small groups with the interactive involvement of the audience in order to propagate towards the goal of implementing efficient and flexible collaborative applications in the industrial field.

TALK 1: Designing roadmaps for improving intralogistics with AGVs and AMRs

This presentation addresses the problem of establishing efficient intralogistic systems, focusing on the generation of roadmaps and movement constraints on a given layout and the coordination of multiple Automated Guided Vehicles (AGVs) or Autonomous Mobile Robots (AMRs). By analysing the system throughput, the optimal fleet size for the system can be determined. The approach is validated through various examples and benchmarked against existing methods in the literature.



Primož Podržaj,
University of Ljubljana, Slovenia



Rok Vrabič,
University of Ljubljana, Slovenia

Parallelsession F

Safety Aspects and Standardization in Collaborative Robotics

TALK 2: Safety and Acceptance Concerns in Human-Centric Manufacturing Technologies for Industry 5.0

In contemporary industries, the philosophy of human-centered workplace design and the integration of operator 5.0 concepts are gaining prominence. This paradigm shift involves customizing the operators' work environment to enhance both their well-being and capabilities, marking a significant stride towards a more personalized and efficient workforce. To enhance risk management, careful attention must be directed towards designing workstations that are not only optimized but also ergonomic, alongside creating favorable environmental working conditions. Within this scope, the prominence of human factors becomes evident, influenced by the array of workforce diversities, including individual abilities, physical capacities, gender, age, and varying levels of confidence in technology. Within this evolving landscape, cutting-edge assistive technologies, particularly collaborative robots and passive exoskeletons, emerge as compelling choices for strategic implementation in production and logistics systems.



Cecilia Scoccia,
Università Politecnica delle Marche

Parallelsession F

Safety Aspects and Standardization in Collaborative Robotics

TALK 3: Trends and revisions of European standards and directives in the field of robotics

Safety and security are the most essential requirements for every machine and plant. The Machinery Directive 2006/42/EG regulates the placing of safe, complete, and incomplete machines on the market. At the end of June, the EU-wide machinery regulation was published, which will replace the machinery directive in the future. This innovation is relevant to all areas of the machinery. Especially for robotics, there is currently an intense revision in the field of standardization. In this talk, we will give an in-sight into the current trends and revisions of the European standards and directives relevant to stationary industrial robots and their applications.



*Michael Rathmair,
Joanneum Research ROBOTICS*



*Clara Fischer,
Joanneum Research ROBOTICS*

TALK 4: Q&A, Discussion

Exhibitor

EPLAN GmbH

Company

EPLAN provides software and service solutions in the fields of electrical, automation and mechatronic engineering. We develop one of the world's leading design software solutions for machine, plant and panel builders.

"Efficient engineering" is our focus: EPLAN is the ideal partner to streamline challenging engineering processes. No matter whether small or large enterprises, we strive to enable our customers to apply their expertise more efficiently.

Products

EPLAN connects software solutions from every engineering discipline – from preplanning and project planning to the design of switchgear and cable harnesses. Cloud-based applications enable you to collaborate across projects and create a standardised database right through to automated engineering. Furthermore, our integrations and standard interfaces enable bi-directional data exchange with your ERP, PLM and PDM systems. This means that you will become more efficient when working on your EPLAN project because digital data flows seamlessly from one solution to another and is further enriched in every process step.



Contact

EPLAN GmbH

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www.eplan.at

Exhibitor

Selmo Technology Selmo

Company

Selmo Technology is an innovator in the controlled digitization and automation of manufacturing processes. Our patented technology sets a new standard by introducing software standardization and, for the first time, a unified operating system for machines. It also enables the standardized and automated creation of programs based on process models of production facilities, leading to a significant increase in the efficiency and quality of your production.

Selmo – For software that never lets you down!

Products

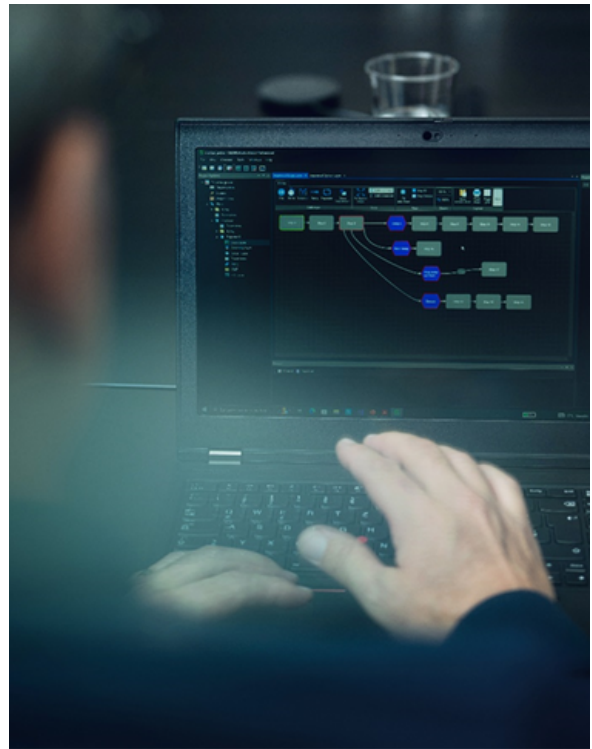
Selmo stands for state-of-the-art Technology. Our future-oriented solution? The Software Defined Standard. This open approach unifies programming, improves process stability, and increases machine availability.

Exhibition - Time Slot I:

Experience the latest technology in automation based on a real-time model of a production line

Exhibition - Time Slot II:

Gain insights into the Software Defined Standard: An Industry First.



Contact

Markus Gruber
einfach@selmo.at
+ 43313620755

Exhibitor



Omron Electronics Ges.m.b.H

Company

OMRON Corporation is a global leader in the field of automation based on its core technology of "Sensing & Control + Think". OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to social systems, healthcare, and environmental solutions. Established in 1933, OMRON has about 29,000 employees worldwide, working to provide products and services in around 120 countries and regions. For more information, visit OMRON's website: <http://industrial.omron.eu>

Products

As a leader in industrial automation, OMRON has extensive lines of control components and equipment, ranging from vision sensors and other input devices to various controllers and output devices such as servomotors, as well as a range of safety devices and industrial robots. By combining these devices via software, OMRON has developed a variety of unique and highly effective automation solutions for manufacturers worldwide.

Exhibition - Time Slot I:

„Live Show / Hands on“

Exhibition - Time Slot II:

„Live Show / Hands on“



Contact

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Exhibitor

Standortagentur Tirol GmbH - Cluster Mechatronik Tirol



STANDORTAGENTUR
TIROL



Kofinanziert von der
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Company

Standortagentur Tirol offers professional support and advice to help you on your road to success.

Products

Innovation, growth, location development and marketing: Standortagentur Tirol has a comprehensive range of services to assist your company or research institute with your growth or start-up projects in Tyrol and will support you in establishing regional, national and international networks. Standortagentur Tirol develops joint projects with you based on the Tyrolean skills triangle of technology, health and tourism, balancing economical and ecological, social and cultural as well as regional and global issues. Our common goal: achieving market leadership, increasing competitiveness, safeguarding existing jobs, and creating new long-term jobs.



Contact

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Exhibitor



fruitcore robotics GmbH

Company and Products

With the Digital Robot Platform, fruitcore robotics offers all the components for automation in industry - from project planning to ongoing operation: Economical. Flexible. Efficient.

The centerpiece of the Digital Robot Platform are the self-developed and AI-supported intelligent industrial robots that fruitcore robotics produces in Germany. In addition, the holistic approach of the company from Lake Constance includes central control software, pre-configured automation modules and supporting services as well as a hybrid training program.

So what can you expect at our booth:

You can experience the Digital Robot HORST live on site. You will get an insight into the intuitive control and programming of our robot system and the innovative features of our control software.

Exhibition - Time Slot I:

Simple graphical programming with free movement of the robot via the touch panel to define waypoints. Demonstration of the graphical palletizing function.

Exhibition - Time Slot II:

Software features such as loading 3D worlds and reference coordinate systems and defining macro buttons to simplify the creation of programs.



Contact

fruitcore robotics GmbH
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Kassow Robots

kassow robots
strong · fast · simple

Company

Founded by our CEO Kristian Kassow, a cobot pioneer well known in robotics industry, Kassow Robots is currently producing five 7-axis cobots in Copenhagen / DK. Since April 2022, Bosch Rexroth is the majority owner of the Danish company having more than 60 sales partners worldwide.

Products

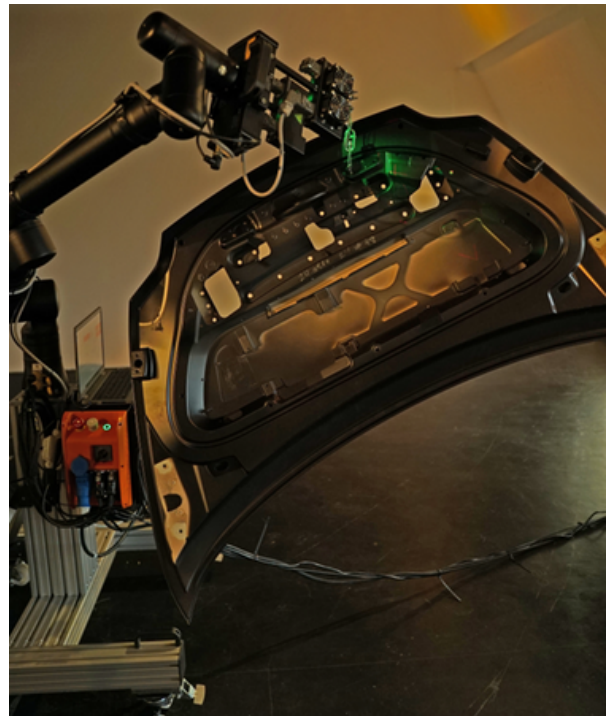
With the claim "Strong, Fast, Simple", Kassow Robots cobots contribute to easy automation. The lightweight robots are uniquely efficient and strong. They have a long reach of up to 1800 mm and payloads of up to 18 kg. Due to the 7th axis, they can be used in the most confined spaces - and provide super flexible and cost-efficient industrial automation.

Exhibition - Time Slot I:

Strong Fast Simple: Check out a KR810 7-axis cobot: the easy-to-use operation and the opportunity to reach around the corner.

Exhibition - Time Slot II:

Strong Fast Simple: Check out a KR810 7-axis cobot: the easy-to-use operation and the opportunity to reach around the corner.



Contact

Kassow Robots ApS
Ulrich Möller, Sales Manager DACH
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0173/9079280

Exhibitor

ecoplus

Company

For 60 years, in our role as the **Business Agency of Lower Austria**, we have been a reliable partner of people in business as well as investors and initiators of regional and international projects. We act as an essential interface between business, politics, and science.

the **ecoplus clusters in Lower Austria** are flexible and innovative industry networks in regional strength areas. They act as an economic hub and driver of innovation for companies in Lower Austria in the following fields of the future: plastics, mechatronics, sustainable building and renovation, food, and the electric mobility initiative of Lower Austria, „E-mobile in Lower Austria“.

The **Mechatronics Cluster** connects all the players involved in mechanical and plant engineering to learn together for the tasks that lay ahead. In this context, the Mechatronics Cluster:

·brings major future trends in industrial production into the sector,

- initiates and coordinates cross-company cooperation projects,
- links electric mobility with higher-level networks of renewable forms of energy,
- makes companies economically and technologically fit for climate-neutral production.

The Mechatronics Cluster is a joint initiative of the Provinces of Lower Austria and Upper Austria.

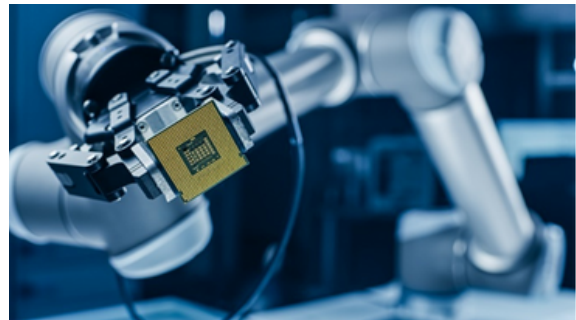
Contact

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Co-funded by the
European Union



Exhibitor



Company

The integration of various technologies into one complete solution is what we are specialized in. We use the latest technologies from mechatronics, automation, digital product development, and artificial intelligence. LCM stands for the reliable implementation of the latest research findings into marketable solutions and products that are precisely tailored to the needs of our customers.

At ERAT 2023 we show examples of customized end-of-arm-tools (EOAT) and robot applications.

Science becomes **reality**



Exhibition - Time Slot I:

Insights

- Test stand automation
- Automated workflow for a robot application

Exhibition - Time Slot II:

Insights

- Automated garbage management
- Optimized components for your EOAT



Contact

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Exhibitor



Company

Hello, we are digifai 😊. We develop software and solutions that make the design and operation of machines safer and more efficient. With over 20 years' experience in industrial automation, we have developed a number of ground-breaking solutions:

👉 With twin, our high-end simulation software, you can test machines before you build them. This reduces risk and saves time and money.

👉 Our IoT platform control helps you to operate machines optimally. control connects, visualizes, notifies, analyzes and orchestrates process data independently from any location. You already have the source data – control shows you the relevant correlations.

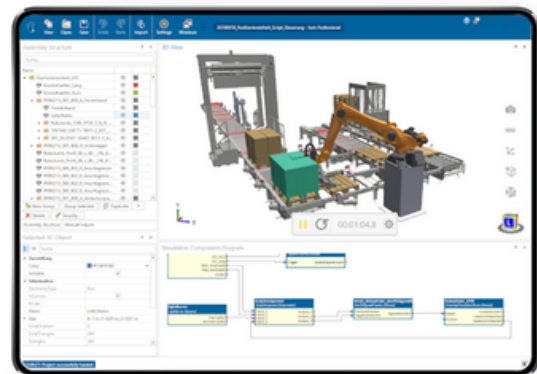
What you can expect at our stand

Early and comprehensive testing using simulation and virtual commissioning on the digital twin reduces risks in the engineering of machines. We will show you live how our high-end simulation software twin helps to

- validate machine concepts at an early stage of an automation project.
- test control software on the digital twin without the need for the real machine.
- create an interactive 3D HMI without additional effort.

Exhibition - Time Slot I:

We will show you how to create physics-based digital twins for virtual commissioning in just a few minutes. Starting with a CAD model of a machine, we add virtual sensors and actuators and finally control this digital twin with a real PLC. Join in and try it out for yourself 🙌!



Exhibition - Time Slot II:

We will show you how to create stunning 3D HMIs using digital twins created with our high-end simulation software twin. Join in and try it out for yourself 🙌!

Contact

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Exhibitor



EIT Manufacturing

EIT Manufacturing was established in 2019 with a vision that global manufacturing will continue to be led by Europe.

Supported by the European Institute for Innovation and Technology (EIT), an organisation of the EU, it brings together a growing network of top-tier industrial partners, leading academic and research institutions from across the region and innovative startups, scaleups and SMEs that are essential for industrial innovation. EIT Manufacturing furthermore connects and integrates the areas of education, innovation and business creation by striving to accelerate faster innovation and ensuring that Europe's workforce is ready to meet tomorrow's challenges.

What you can expect from us:

Among the diverse innovation initiatives led by EIT Manufacturing, we facilitate corporate collaborations with startups through various channels. One prominent avenue is our annual innovation call, aimed at supporting high Technology Readiness Level (TRL) research and innovation projects, easing market entry for ventures. Moreover, we extend targeted invitations and consultations to Small and Medium-sized Enterprises (SMEs) and startups, encouraging the formation of consortia for EIT Manufacturing funded projects.

Additionally, we host the BoostUp Challenge and BoostUp Bridge initiatives that focus on startups and scale-ups across Europe, by addressing key industrial challenges.

Through these programs, we foster innovative solutions along with meaningful partnerships between corporations and emerging ventures.

Exhibition - Time Slot I:

Discover comprehensive information about the opportunities EIT Manufacturing can provide you with.

Exhibition - Time Slot II:

Gain detailed insights in the diverse potentials such as financial opportunities we can offer your company.



Contact

David Kames
Senior Project Manager
david.kames@eitmanufacturing.eu

Exhibitor

Universal Robots



About us

Universal Robots is a leading provider of collaborative robots (cobots) used across a wide range of industries and in education. Founded in 2005 and headquartered in Odense, Denmark, Universal Robots aims to create a world where people work with robots, not like robots. Its mission is simple: Automation for anyone. Anywhere. Since introducing the world's first commercially viable cobot in 2008, Universal Robots has developed a product portfolio reflecting a range of reaches and payloads and has sold over 75,000 cobots worldwide. An extensive ecosystem has grown around the company's cobot technology creating innovation, choice for customers and a wide range of components, kits and solutions to suit every application.

Our Products

Universal Robots' e-Series, first introduced in 2018, includes cobots with different payloads and reach to suit work in widely variable industrial applications. In 2022, Universal Robots announced the addition of UR20 - the first of an innovative next generation of cobots which will complement the company's highly successful e-Series. The cobot boasts an all-new joint design and will allow for even faster cycle times as well as the ability to handle heavier loads.

UR20 has a payload of 20 kg

UR16e has a payload of 16 kg

UR10e has a payload of 10 kg

UR5e has a payload of 5 kg

UR3e has a payload of 3 kg

Exhibition - Time Slot I: 10:25 - 11:10 Uhr

We will introduce our cobot and demonstrate the easy programming.

Exhibition - Time Slot II: 14:35 – 15:20 -Uhr

Our demo application will demonstrate the ease of use and possibilities with our cobots.

Contact

David Scherrer

Area Sales Manager Austria

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Cell: +43 664 1252041

November 13th, 2023 | 09:00 am

Schloss Seggau | Seggauberg 1 | 8430 Leibnitz | Austria

„ROBOTICS & AUTOMATION: INNOVATIONS FOR A SUSTAINABLE INDUSTRY!“

European Robotics and Automation Talks (ERAT) 2023



digifai

AGILEX



Selmo



UNIVERSAL ROBOTS

kassow robots
strong · fast · simple

KNAPP



SIEMENS



OMRON



UNIVERSITY
OF TRENTO - Italy

LEM LINZ
CENTER OF
MECHATRONICS



AT STYRIA
Plattform Automatisierungstechnik

GMAR



WISTO



compact
electric

MIEL®

Wir bedanken uns bei allen Vortragenden und Partnern!