# Curriculum Vitae of ERWIN RAUCH


**Personal information**

**ERWIN RAUCH**

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**Education**

- 2023: **National Scientific Habilitation (ASN)** for Full Prof. level in the scientific sector IIND-04/A (Manufacturing technology and systems – former ING-IND/16).
- 2019: **National Scientific Habilitation (ASN)** for Assoc. Prof. level in the scientific sector IIND-04/A (Manufacturing technology and systems – former ING-IND/16).
- 2013: **PhD (Dr.-Ing.), Research Doctorate**, dissertation titled "Concept of a changeable and modular production system for franchising models", Supervisor: Univ.-Prof. Dr.-Ing. Dr.-Ing. E.h. Dr. h.c. Dieter Spath, University of Stuttgart, Germany, grade: "summa cum laude".
- 2004-2007: **Dipl.-Wirtsch.-Ing., Master in Business Administration** with specialization in Accounting-Auditing-Consulting and Logistics, TUM Business School, Munich, Germany.
- 2004-2006: **M.Sc., Master of Science in Mechanical Engineering** with specialization in Production Management, Technical University of Munich (TUM), Germany.
- 2001-2004: **B.Sc., Bachelor of Science in Production and Logistics**, Politecnico di Torino / Free University of Bolzano, Italy.
- 1996-2001: **Technical High-School degree** in Mechanical Engineering, Bolzano, Italy.

**Appointment**

- **Since 02/2026 Full Professor in Manufacturing Systems and Technologies (IIND-04/A)** – Free University of Bolzano, Faculty of Engineering
- **02/2023 – 01/2026 Endowed Professor in Manufacturing Systems and Technologies (IIND-04/A)** – Free University of Bolzano, Faculty of Engineering, endowed professorship for "Sustainable Manufacturing" at the campus NOI Techpark Bruneck)
- **07/2022 – 01/2023 Associate Professor in Manufacturing Systems and Technologies (IIND-04/A)** – Free University of Bolzano, Faculty of Science and Technology
- **2014-2022 Assistant Professor in Manufacturing Systems and Technologies (IIND-04/A)** – Free University of Bolzano, Faculty of Science and Technology
- **Since 2023 Founder and Head of the new "Sustainable Manufacturing Lab"** at the NOI Techpark in Bruneck – https://sustainablemanufacturinglab.unibz.it/
- **Since 2014 Head of "Smart Mini Factory" laboratory for Industry 4.0** at the Faculty of Science and Technology – https://smartminifactory.it/
- **Since 2023 Delegate for Third Mission** at the Faculty of Engineering

- **2016-2022 Second Member (Vice-Director) of the study course council for the Master in Industrial Mechanical Engineering (LM-33)**, coordination of the international Double Degree program with Otto v. Guericke University of Magdeburg (Germany)
- **Member of the Ph.D. Collegium** in "Sustainable Energy and Technologies" (2014 – 2018 and 2023-2025) and "Advanced Systems Engineering" (2019 - 2022), Faculty of Science and Technology, unibz.
- **Advisory Board Member** Fraunhofer Italia Research.
- **Member of the International Advisory Board of IGIP** (International Society for Engineering Pedagogy)
- **Steering Board Member** and coordinator of research projects of EPIEM (European Professors of Industrial and Engineering Management)
- **Scientific Committee Member** of the International Association of Learning Factories (IALF)
- **Executive Committee Member and Publication Committee Chair** of the International Association of Axiomatic Design (IAAD)
- **Board of Directors** of the Axiomatic Design Research Foundation (ADRF)
- **Director** of the European Research Centre for Axiomatic Design (ERCAD) funded by ADRF
- **Editor in Chief** of the Journal Production & Manufacturing Research (Taylor & Francis – Q2 in Scopus)

**Professional experience**

- 2020 – 2023: **Instructor of online courses for C-level executives and vice presidents – Smart-Manufacturing-Network**, a brand of Manufacturing Leaders Ltd., masterclasses on Industry 4.0 Technology & Data: Digital Manufacturing in the Factory of the Future.
- September 2018 – today: **Contract Professor** – **Management Center Innsbruck (Austria)**, lecturer in the in the course "Production Engineering and Operations III" and "Systems Engineering" (in English), Master in Industrial Engineering.
- February 2017 – February 2018: **Contract Professor** – **International School of Management (Germany)**, lecturer in the course "International Operational Management" (in English), Master in International Management, Campus Munich (Germany).
- February 2013 – February 2014: **Contract Professor - Free University of Bolzano (Italy)**, lecturer in the course "Production Planning and Control", Bachelor in Industrial and Mechanical Engineering.
- February 2012 – February 2017: **Associate Partner at Matt & Partner Management Consulting** in Bolzano (Italy).
- February 2007 – February 2012: **Consultant at Matt & Partner Management Consulting** in Bolzano (Italy) - Project management in international consulting projects (manufacturing systems planning, factory planning, lean and operations management, logistics and supply chain management, production planning and control).
- 2009 – 2011: **Research Assistant** in the research project "Design of lean and agile material handling systems in make-to-order production", Free University of Bolzano (Italy).
- 2007 – 2013: **Teaching Assistant** in numerous courses at the Faculty of Science and Technology, Free University of Bolzano (Italy).
- 2006 – 2007: **Business Analyst at ifp Consulting** in Munich (Germany), Institute for Production and Logistics, Prof. Dr.-Ing. Joachim Milberg – Technical Management Consulting for Bosch and ZF Sachs.

**Experience in academic teaching**

Current lectures at Free University of Bolzano:

- A.y. 2024/25 – today: Lecturer in **Technologies and Production Processes for Energy Engineering (Part on Sustainable Manufacturing)**, Free University of Bolzano, Master in Energy Engineering (LM30), 6 ECTS, 24 hours lecture, Language: English.
- A.y. 2014/15 – today: Lecturer in **Production Systems and Industrial Logistics**, Free University of Bolzano, Bachelor in Industrial and Mechanical Engineering (L9), 10 ECTS, 36 hours of exercise and laboratory, Language: German.
- A.y. 2014/15 – today: Lecturer in **Digital Production Planning and Quality Assurance**, Free University of Bolzano, Bachelor in Industrial and Mechanical Engineering (L9), 8 ECTS, 64 hours lecture, Language: German. Former course title "Production Planning and Control" before 2020/21.
- A.y. 2023/24 – today: **Innovation Management and Sustainable Production**, Free University of Bolzano, Bachelor in Industrial and Mechanical Engineering (L9), 3 ECTS, 8 hours lecture, optional course for undergraduates, Language: German.

**Areas of scientific interest**

*Focus from 2014 – 2020*

**Planning, Design and Management of Smart Factories within Industry 4.0**

The overarching aim includes the investigation of methods and technologies for the planning, design and management of production systems following the concept of digital transition towards a digitalized and factory 4.0. Especially small and medium sized enterprises need specific tools and methods for mastering the digital transformation and to manage the step from a smart factory (using IoT, MES etc.) towards an intelligent factory (using digital twin, AI etc.). In addition new technologies like human-robot collaboration and worker assistance systems empower a new level of flexible and human-centred manufacturing system design.

**Industry 4.0 and Smart Manufacturing for SMEs**

- Analysis of specific needs and challenges of SMEs
- Implementation of Industry 4.0 in SMEs
- Design guidelines and roadmaps for introducing Industry 4.0
- Industry 4.0 assessment for SMEs

Study of methods, tools and roadmaps for the introduction of Industry 4.0 technologies and concepts in SME companies. The aim is to study which of the currently existing or emerging Industry 4.0 technologies are especially applicable for small, medium as well as large enterprises. This includes the development of Industry 4.0 assessment models based on maturity levels of implementation, the definition and testing of Industry 4.0 implementation roadmaps and the investigation of applications in a lab environment as well as in industrial case studies.

**Digitalization in Production and Intelligent Manufacturing**

- Industrial IoT, connectivity and interoperability in cyber-physical production systems
- Digital twin modelling/simulation in digital manufacturing
- Application of artificial intelligence and machine learning in manufacturing

The aim is to study methods for the digitization in production through the use of IoT solutions and simulation to create a digital twin of cyber-physical production systems. Digitalization plays an important role in the operation of a factory by realizing an uninterrupted vertical data integration from the Enterprise Resource Planning (ERP) level over Manufacturing Execution Systems (MES) to the production shopfloor. A main goal in this research field is how companies can eliminate paper-based operational processes and use digital software tools in all levels of manufacturing system design, production planning and quality control. Based on recent advancements in artificial intelligence (AI) and machine/deep learning, an aim is also to study fields of application of AI in manufacturing. In Google scholar I am one of the 10 most cited scholars for Digital Manufacturing.

**Design of Flexible Industrial Human-Robot Collaborative Assembly Systems**

- Design guidelines for human-robot collaborative workspaces
- Safety and (physical/cognitive) ergonomics in human-robot collaboration
- Design for collaborative assembly (DfCA)

Industry 4.0 technologies such as collaborative robotics represent a great opportunity (especially for small and medium-sized enterprises), to combine the potential of automation with the flexibility in producing individual products in small batch sizes. The implementation of such collaborative workplaces is still critical, as there is still a lack of design guidelines with regard to safety and ergonomics. While the robot itself is safe, this can change depending on the situation, which makes it difficult for many companies to take advantage of this technology. It is therefore necessary to develop methods for risk assessment, design guidelines for safe and ergonomic collaborative assembly systems and to investigate the impact on physical and cognitive ergonomics.

*Focus from 2020 – 2026*

**Sustainable Manufacturing within Industry 5.0**

The sustainable transition towards green factories of the future still needs digital technologies acting as enabler for sustainability. Ecological as well as social sustainability in manufacturing enterprises and especially SMEs are addressed. Circular manufacturing and decarbonization strategies play a major role. Methods like lifecycle analysis (LCA) or Energy Audits are used for identifying and quantifying the potential of ecological sustainability. Furthermore, manufacturing systems and factories are complex socio-technical systems, which is why complex system design methods are helpful and valuable. A particular concern is also the development of modern concepts of engineering education and learning factories for qualification and up-/reskilling.

**Decarbonization and Eco-intelligent Factories**

- Lifecycle Assessment (LCA)
- Sustainable Factory Design Decomposition (SFDD)
- Sustainability Performance Monitoring and Reporting

I use lifecycle assessment (LCA) methods, software and databases to assess company's carbon footprint, whether for specific products or the entire organisation. Based on these insights, effective decarbonisation strategies can be derived. Further in my research group we are working on innovative ways for the design of net zero emission factories through MBSE decomposition and intelligent Sustainable Digital Twins. A further goal is complexity reduction and efficient sustainability performance measurement, monitoring and CSRD-ESRS reporting based on data-driven system architectures.

**Circular Economy in Manufacturing**

- Circular Economy Guidelines
- Reconfigurable manufacturing systems design (micro-level)
- Industrial Symbiosis (meso-level)
- Smart assistance systems in manufacturing and assembly

To minimise waste and keep resources in circulation, my research group analyses company's current processes, manufacturing systems and value/supply chains, identifying opportunities for circular and cascading production methods. Therefore we conducted studies to derive a set of guidelines for CE for sectors relevant to the territory like automotive, construction and wood manufacturing. On a micro-level flexible and reconfigurable design of manufacturing systems is key for increasing circularity of factories itself. On a meso-level we study the potential of Industrial Symbiosis applying circular economy principles among multiple similar or diverse organizations and networks (e.g industrial parks).

**Resource Efficiency and Zero Waste Management**

- Energy Audit and flow analysis
- IoT based Energy monitoring and optimization
- Dynamic supply chain risk assessment
- Recycling and zero-waste strategies

We analyse company's material and energy flows within factories and along the supply/value chain, tracking them digitally to optimise resource usage. Through the adoption of digital technologies, we develop solutions for data collection, energy monitoring as well as AI/ML approaches for energy prediction and optimization strategies. Digital technologies further allow dynamic risk management along the supply chain for early detection of disasters or unplanned events. Zero waste management includes the prevention of waste through the use of sustainable materials and eco-design of products as well as waste-to-value concepts and recycling strategies.

**Ethical and Social Sustainability**

- Work 4.0 and human-centered manufacturing
- Empowering humans through worker assistance systems
- (Human) value sensitive design of socio-technical systems
- Biological transformation in manufacturing

A human-centred workplace should allow operators to optimise effectiveness and efficiency through appropriate assistance systems. This research includes the investigation of the most promising worker assistance systems for different kinds of user groups empowering workers and compensating deficits (e.g. aging workforce or disabled workers). A specific focus in this research lies in the integration of the human in smart factories addressing aspects of social sustainability as well as ethics. Based on a human-value sensitive design approach also ethical aspects of introducing emerging technologies are addressed. Incorporating human values into the design of technical systems, such as trustworthy and ethical AI assistance tools, is essential for empowering workers and for facilitating diversity and inclusiveness in manufacturing.

*Focus from 2014 – 2025*

**General research fields**

For my research on smart manufacturing and sustainable manufacturing I used principles and methods taken from Systems Engineering and especially Axiomatic Design to manage complexity and improve robustness and resilience of

manufacturing systems. Moreover, I am also active in researching innovative Engineering Education methods, especially determined by researching advances of learning factories as well as problem-based and experience-based learning.

**Systems Engineering for Complex Systems Design**

- Systems Engineering and Ontology Modelling
- Design of complex systems with Axiomatic Design
- Application for smart and sustainable manufacturing

Manufacturing systems are large socio-technical systems showing a high degree of complexity in their design. According to complexity theory, factories underly time dependent complexity as their system range moves over time outside the originally defined design range. In my research I apply and develop Axiomatic Design theory as one of the most common design theories in Systems Engineering. While Axiomatic Design has been originally developed at MIT, I have actually one of the most active research groups worldwide working with Axiomatic Design. In Google scholar I am the 2nd most cited scholar in Axiomatic Design using this methodology in straight collaboration with colleagues from USA. This led the Axiomatic Design Research Foundation from to nominated me in the Board of Directors and to fund the European Research Centre for Axiomatic Design which I lead as Director.

**Engineering Education**

- Industry 4.0/5.0 learning factories
- Qualification and training of employees in digital and green skills
- Innovative didactic concepts for HEI and VET

The way engineering education is delivered has changed significantly with the introduction of digital technologies, Industry 4.0 an increasing focus on sustainability. In particular, many universities have looked at learning factories as a practical and innovative learning method in recent years. Since 2012, I am working on the establishment and further research and development of the learning factory concept for students and professionals at the Free University of Bolzano. Through close contact with colleagues from the renown International Association of Learning Factories (IALF) I am testing and developing new forms of practice-oriented teaching paired with the latest concepts of smart and sustainable manufacturing and disseminating this learning concept to other countries (e.g. setting up 6 makerspaces in Ethiopia and Djibouti as well as 7 learning factories in Latin America). Due to my expertise I have been nominated to be part of the International Advisory Board of IGIP, a renown International Society for Engineering Pedagogy.

**Research projects and third party fund raising**

The undersigned is/was involved in the following 86 research projects in the role of PI, Co-Investigator or team member. Projects are ordered according to funding schemes going from international/European to national/local grants and commissioned industry projects. **Total acquired volume for unibz in 86 projects is € 7.4 mio**: ~ € 4.0 mio. with international/European projects (55%), ~ € 1.9 mio. with national/regional research projects (25%), ~ € 0.88 mio. with unibz grants (12%) and ~ € 0.62 mio. with commissioned/industry projects (8%). **Third party funding rate of >88%.**

<u>International/European Grants (21 projects):</u>

| | |
|---|---|
| **2025 – 2028** | **AMARU 5.0 – Latin American Learning Factory Network for Smart and Sustainable Engineering Education** |

Role: PI
Duration: 01.10.2025 – 31.09.2028
Funding Body: Erasmus+ Capacity Building for HE
Budget unibz: € 101.041,00 (total budget € 800.000,00)
Research consortium with partners from Austria, Colombia, Argentina, Brazil and Mexico.

**2025 – 2028** **ROBO TOOL - A Toolkit for Designing Human-Centered Collaborative Robotic Assembly Systems**
Role: Team member
Duration: 01.06.2025 – 31.05.2028
Funding Body: Autonomous Province Bolzano - Joint Projects CH-I
Budget unibz: € 299.173,00
Joint project with SUPSI.

**2025 – 2027** **MIM - Manufacturing Innovation Management for SME Considering Ambidexterity with Integration of Virtual and Remote Innovation- and Learning-Factories**
Role: Partner and PI unibz
Duration: 01.01.2025 – 31.12.2027
Funding Body: Autonomous Province Bolzano - Joint Projects Germany (DFG)
Budget unibz: € 262.000,00
Joint project with TUM Technical University Munich.

**2023 – 2026** **MADE-for-UAS – Methodology and Didactics Education for Universities**
Role: Co-I unibz
Duration: 01.12.2024 – 30.11.2027
Funding Body: Erasmus+ Capacity Building for HE
Budget unibz: € 53.319,00 (total budget € 452.517,00)
Research consortium with partners from Austria, Germany, Ethiopia and Djibouti.

**2024 – 2027** **TRAINEE - Advanced MR Training foR HumAn-Centric ProductIon EmpoweriNg Engineering TalEnt**
Role: Co-I unibz
Duration: 01.11.2024 – 31.10.2027
Funding Body: Erasmus+ KA 2-3
Budget unibz: € 69.891,00 (total budget € 325.000,00)
Research consortium with 4 partners University of Malta, Royal Institute of Technology (KTH), University of Rijeka, University Politehnica of Bucharest

**2024 – 2026** **R3D – Redundancy for resilience in smart factories of the future through hybrid mobile robotic systems**
Role: Co-I unibz
Duration: 01.01.2024 – 31.12.2026
Funding Body: Autonomous Province Bolzano - Joint Projects Germany (DFG)
Budget unibz: € 225.500,00
Research project with RWTH Aachen.

**2024 – 2026** **SMF4INFRA - Smart Mobile Factory for Infrastructure Projects**
Role: team member
Duration: 01.01.2022 – 31.12.2024
Funding Body: Autonomous Province Bolzano - Joint Projects Switzerland (SNF)
Budget unibz: € 266.403,00 (total budget € 934.572,00)
Joint project with ETH Zürich and Eurotube Hyperloop research organization.

**2023 – 2027** **EE4M – Engineering Excellence for Mobility Value Chain**
Role: Partner and PI unibz
Duration: 01.01.2023 – 31.12.2026
Funding Body: Erasmus+ KA 2-3 (Centre of Vocational Excellence CoVEs)
Budget unibz: € 514.199,00 (total budget € 3.535.985,00)
Research consortium with 14 international partners.

**2023 – 2026** **SUSEE - Smaller Universities for Sustainability in Engineering Education**
Role: Partner and PI unibz
Duration: start date to be defined, already aquired
Funding Body: Erasmus+ Cooperation Partnership
Budget unibz: € 97.750,00 (total budget € 400.000,00)
Research consortium with partners from Poland, France and Germany.

**2023 – 2026** **EDU-CIRC - Cross-border network for education and training in the circular economy and decarbonization in production**
Role: PI
Duration: 21.11.2023 – 31.07.2026
Funding Body: Interreg Italy-Austria
Budget unibz: € 368.424,00 (total budget € 930.120,00)
Research consortium with partners from Austria.

**2023 – 2026** **SME 5.0 – A Strategic Roadmap Towards the Next Level of Intelligent, Sustainable and Human-Centred SMEs**
Role: Co-I unibz and Project Manager (PI Prof. Dominik Matt)
Duration: 01.01.2023 – 31.12.2026
Funding Body: HORIZON-MSCA-2021-SE-01
Budget unibz: € 248.400,00 (total budget € 1.168.400,00)
Research consortium with 16 partners: Technical University Munich - Germany, Technical University Graz – Austria, KTH – Sweden, Montanuniversität Leoben - Austria, Technical University Kosice - Slovakia, University of Malta, Purdue University – USA, Worcester Polytechnic Institute – USA, Chiang Mai University - Thailand, Universidad de Salvador – Argentina, University of Stellenbosch – South Africa, Deakin University – Australia, Elcom sro – Slovakia, Komptech GmbH

– Austria, Endian srl – Italy).

**2023 – 2026** **EtD-FaM – Ethiopia-Djibouti Female Makerspaces**
Role: Partner and PI unibz
Duration: 01.12.2023 – 30.11.2026
Funding Body: Erasmus+ Capacity Building for HE
Budget unibz: € 47.404,00 (total budget € 379.348,00)
Research consortium with partners from Austria, Germany, Ethiopia and Djibouti.

**2022 – 2025** **SESTO SENSO - Physical Cognition for Intelligent Control and Safe Human-Robot Interaction**
Role: Co-Investigator for unibz
Duration: 01.09.2022 – 31.08.2025
Funding Body: Horizon Europe (RIA)
Budget unibz: € 300.000,00 (total budget € 5.619.026,00)
Consortium with other 13 European academic and industrial partners: Università degli Studi di Genova, University of Oxford, Centro Ricerche Fiat, Idiap Research Institute, University of Zaragoza, University of Ljubljana, University of Latvia, The Centre for Research and Technology Hellas, University of Bologna, Ocado innovation, INERTIA Technology, RISE Research Institutes of Sweden, Institut Franco-Allemand de Recherches de Saint Louis

**2022 – 2024** **SMF4INFRA - Smart Mobile Factory for Infrastructure Projects**
Role: team member
Duration: 01.01.2022 – 31.12.2024
Funding Body: Autonomous Province Bolzano - Joint Projects Switzerland (SNF)
Budget unibz: € 266.403,00 (total budget € 934.572,00)
Joint project with ETH Zürich and Eurotube Hyperloop research organization.

**2020 – 2023** **ETAT - Education & Training for Automation 4.0 in Thailand**
Role: PI unibz
Duration: 15.01.2020 – 14.01.2023
Funding Body: Erasmus+ KA 2-3
Budget unibz: € 63.966,00 (total budget € 997.757,00)
Research consortium with 13 partners: Carinthia University of Applied Sciences, University of Antwerp, University of Porto, University of Oviedo, Slovak University of Technology in Bratislava, Rajamangala University of Technology Tawan-ok, Rajabhat Rajanagarindra University, King Mongkut's University of Technology North Bangkok, King Mongkut's Institute of Technology Ladkrabang, Kasetsart University, Edunet World Association, Eastern Economic Corridor Office, Burapha University

**2019 – 2022** **ICARUS - An Innovative Higher Education Institution Training Toolbox to EffeCtively AddRess the EUropean**

**InduStry 4.0 Skills Gap and Mismatches**
Role: PI unibz
Duration: 01.09.2019 – 28.02.2022
Funding Body: Erasmus+ KA 2-3
Budget unibz: € 62.000,00 (total budget € 325.000,00)
Research consortium with 4 partners University of Malta, Royal Institute of Technology (KTH), University of Minho, University Politehnica of Bucharest

**2017 – 2021** **SME 4.0 – Industry 4.0 for SMEs**
Role: Co-I unibz and Project Manager (PI Prof. Dominik Matt)
Duration: 01.01.2017 – 31.12.2021
Funding Body: H2020 MSCA RISE 2016
Budget unibz: € 311.500,00 (total budget € 783.000,00)
Research consortium with 8 partners: Montanuniversität Leoben - Austria, Technical University Kosice - Slovakia, Elcom sro – Slovakia, Massachusetts Institute of Technology – USA, Worcester Polytechnic Institute – USA, Chiang Mai University - Thailand, SACS MAVMM – India). First EU H2020 project of unibz as project coordinator.

**2019 – 2020** **WIRECOBOTS - Wire harness assembly using collaborative robots to increase efficiency and ergonomics**
Role: team member (PI Prof. Renato Vidoni)
Duration: 15.04.2019 – 14.12.2020
Funding Body: ESMERA – EU Cascade funding
Budget unibz: € 100.000,00 (total budget € 200.000,00)
Research project and pilot implementation with the company Carretta srl.

**2019 – 2020** **CoHoMe - Comparison and Homogenization Of Safety Measurements**
Role: team member (PI Prof. Renato Vidoni)
Duration: 15.06.2019 – 14.03.2020
Funding Body: COVR – EU Cascade funding
Budget unibz: € 20.000,00 (total budget € 100.000,00)
Research project with Joanneum Research and Technical University Graz.

**2018 – 2021** **E-EDU 4.0 - Engineering Education 4.0**
Role: Co-I (PI Prof. Dominik Matt)
Duration: 01.05.2018 – 30.04.2021
Funding Body: European Regional Development Fund (ERDF) - Interreg Italy-Austria
Budget unibz: € 180.000,00 (total budget € 1.150.000,00)
Research consortium with 5 partners: Carinthia University of Applied Sciences – Austria, HTL Höhere Technische Bundeslehranstalt Wolfsberg – Austria, Friuli Innovazione Centro di ricerca e di trasferimento tecnologico – Italy, t2i– trasferimento tecnologico e innovazione – Italy, Camera di Commercio di Treviso e Belluno – Italy.

**2018 – 2019** **A21 - A21DIGITAL TYROL VENETO**
Role: team member (PI Prof. Dominik Matt)
Duration: 01.03.2018 - 31.12.2019
Funding Body: European Regional Development Fund (ERDF) - Interreg Italy-Austria
Budget unibz: € 155.000,00 (total budget € 300.000,00)
Research consortium with A21-Austria and University of Verona.

National/Regional Grants (14 projects):

**2025-2025** **CEI50SD – Toolkit for Analysing Circular Economy in SMEs Applying System Dynamics**
Role: PI
Duration: 15.04.2025 – 30.11.2025
Funding Body: Autonomous Province of Bolzano – Mobility Fund
Budget unibz: € 39.100,00
Project in collaboration with Universidad del Salvador in Buenos Aires (Argentina).

**2024-2027** **INCLUSION 5.0 – Driven Design of Production Systems for Improving Inclusion and Equality of Disabled Workers**
Role: PI
Duration: 01.06.2024 – 31.05.2027
Funding Body: Autonomous Province of Bolzano – 5th Research Call
Budget unibz: € 182.328,00 (total budget € 416.500,00)
Project in collaboration with Fraunhofer Italia Research.

**2024-2027** **PNRR – Doctorate 40. cycle**
Role: PI
Duration: 01.11.2024 – 31.10.2027
Funding Body: PNRR funding for doctorate 40. cycle
Budget unibz: € 60.000,00
Funding for 1 doctorate position co-funded by industry.

**2023-2026** **START – Sustainable Data-Driven Manufacturing**
Role: PI unibz
Duration: 01.07.2023 – 30.06.2026
Funding Body: MISE - Ministero dello Sviluppo Economico
Budget unibz: € 551.875,00 (total budget € 6.873.292,69)
Research consortium with Gresmalt spa, Sacmi spa, Università di Sassari and Università della Calabria.

**2023-2026** **PNRR – Doctorate 39. cycle**
Role: PI
Duration: 01.11.2023 – 31.10.2026
Funding Body: PNRR funding for doctorate 39. cycle
Budget unibz: € 76.000,00
Funding for 2 doctorate positions co-funded by industry.

**2023-2025** **SFDD – Sustainable Factory Design Decomposition**

Role: PI
Duration: 01.02.2023 – 31.01.2025
Funding Body: Autonomous Province of Bolzano – Mobility Fund
Budget unibz: € 154.600,00
Research proposal for funding a 2-year position of a senior researcher, project in collaboration with Purdue University.

**2022-2023** **ASSIST4RESILIENCE – Increasing Resilience in Manufacturing - Development of a Digital Twin Based Worker Assistance**
Role: PI
Duration: 01.01.2022 – 31.12.2023
Funding Body: Autonomous Province of Bolzano – Mobility Fund
Budget unibz: € 169.500,00
Research proposal for funding a 2-year position of a senior researcher

**2022-2023** **SEQP – Smart Enterprise Qualification Program**
Role: Principal Investigator
Duration: 01.02.2022 – 31.03.2023
Funding Body: European Social Fund (ESF)
Budget unibz: € 56.729,00
Interdisciplinary proposal for a qualification program for professionals from industry (Faculty of Science and Technology and Faculty of Computer Science)

**2020-2022** **SUSTAINABLE SMEs 4.0 – Development of a Methodology for the Long-Term Sustainable Introduction of Industry 4.0 in SMEs**
Role: PI
Duration: 26.04.2020 – 24.10.2022
Funding Body: Autonomous Province of Bolzano – mobility fund
Budget unibz: € 28.625,00
Research project with Prof. David Cochran, Purdue University, USA.

**2021-2022** **CAMP-2022 - Digital and Technology Summer Camp 2022**
Role: PI
Duration: 14.10.2021 – 31.08.2022
Funding Body: European Social Funding (ESF)
Budget unibz: € 35.716,80
Project for technology transfer to schools in collaboration with Bitz Fablab.

**2021-2021** **CAMP-2021 - Digital and Technology Summer Camp 2021**
Role: PI
Duration: 17.06.2021 – 31.07.2021
Funding Body: European Social Funding (ESF)

Budget unibz: € 35.825,00
Project for technology transfer to schools in collaboration with Bitz Fablab.

**2021-2021** **PCK – Women in Construction**
Role: PI
Duration: 01.01.2021 – 30.10.2021
Funding Body: European Social Funding (ESF)
Budget unibz: € 1.600,00
Project for qualifying women in construction in advanced technologies.

**2020-2021** **BUILD UP – Costruiamo il Futuro**
Role: PI
Duration: 01.09.2020 – 30.04.2021
Funding Body: European Social Funding (ESF)
Budget unibz: € 1.600,00
Project for qualifying non-EU foreigners who fall under the definition of vulnerable.

**2017 – 2020** **COCKPIT - Collaborative Construction Process Management**
Role: Team member
Duration: 01.01.2017 – 31.12.2020
Funding Body: ERDF (EFRE/FESR) call 2015
Budget unibz: € 503.200,00
Interdisciplinary project with the Faculty of Computer Science and Fraunhofer Italia.

Internal unibz Grants (12 projects):

**2025-2026** **RE-FACTORY - CirculaR Economy FACTORY for Fostering Circularity in Manufacturing**
Role: PI
Duration: 01.07.2025 – 31.12.2026
Funding Body: UNIBZ 2025 call
Budget unibz: € 150.000,00
Infrastructure project for setting up a laboratory for testing and developing R-Strategies for Sustainable Manufacturing

**2024-2026** **START-UP – Sustainable Manufacturing Lab**
Role: PI
Duration: 16.05.2024 – 15.05.2026
Funding Body: UNIBZ 2025 call
Budget unibz: € 70.000,00
Start Up Fund for Endowed Professorship

**2020-2022** **SMART APP- Automated Process Planning in Cyber Physical Production Systems of Smart Factories**
Role: PI
Duration: 01.10.2020 – 30.09.2022
Funding Body: UNIBZ ID 2020 call
Budget unibz: € 130.400,00
Interdisciplinary project proposal with the Faculty of Computer

Science

**2020-2023** **MASTERMIL - Mastering the digital transformation in the family business: Getting ready for the Millennial generation**
Role: team member (PI Prof. Alfredo De Massis)
Duration: 01.09.2020 – 31.08.2023
Funding Body: UNIBZ ID 2020 call
Budget unibz: € 173.000,00
Interdisciplinary project proposal with the Faculty of Economics and Management

**2019-2022** **ASSIST4WORK - Social sustainability in production through age-appropriate and disability-friendly workplace design using assistance systems**
Role: Co-I (PI Prof. Dominik Matt)
Duration: 15.01.2019 – 14.07.2022
Funding Body: UNIBZ CRC 2018 call
Budget unibz: € 98.000,00
Project in collaboration with the social enterprise gwb Bolzano and Fraunhofer Italia.

**2017-2021** **EYE TRACK - Expand more information panel Industrial Usability of Eye Tracking for Manufacturing and Design in SMEs**
Role: PI (changed to Co-I from 01.03.2019)
Duration: 01.11.2017 – 31.01.2021
Funding Body: UNIBZ CRC 2017 call
Budget unibz: € 63.000,00
Project in collaboration with Technische Fachoberschule Max Valier Bozen, University of Modena and Reggio Emilia, Fraunhofer Italia Research, Landesverband der Handwerker, Barbieri electronics, Planit srl.

**2017-2020** **SMART SHOPFLOOR - Development of a software prototype for intelligent Shop Floor Management through Industry 4.0 technologies**
Role: Co-I (PI Prof. Dominik Matt)
Duration: 01.01.2017 – 31.12.2020
Funding Body: UNIBZ CRC 2016 call
Budget unibz: € 70.000,00
Project in collaboration with Innovaalp and Anytime srl.

**2015-2016** **DIMASY – Design of decentralized and distributed manufacturing systems and their coordination in manufacturing networks**
Role: PI
Duration: 01.01.2015 – 31.12.2016
Funding Body: UNIBZ CRC 2014 call
Budget unibz: € 34.500,00
Project in collaboration with Fraunhofer Italia Research and Tecnomag GmbH.

**2015-2017** **REBU - Business Model Reconfiguration and Innovation**
Role: Co-I
Duration: 01.01.2015 – 31.03.2017
Funding Body: UNIBZ CRC call 2014
Budget unibz: € 39.050,00.
Project with industrial partners Fraunhofer Italia – Italy, University of Udine – Italy, Frener & Reifer GmbH – Italy.

**2014-2017** **Future-LPD - Experts survey to assess the transfer of lean methods from production to product development**
Role: PI
Duration: 01.12.2014 – 31.01.2017
Funding Body: UNIBZ RTD call
Budget unibz: € 4.300,00.

**2013-2016** **FISSMEs - Field study to determine requirements for flexible and agile manufacturing and assembly systems for SMEs**
Role: team member (PI Dr. Pasquale Russo Spena)
Duration: 01.11.2013 – 30.04.2016
Funding Body: UNIBZ CRC call 2013
Budget unibz: € 32.000,00.

**2008-2011** **Design of lean and agile material handling systems**
Role: team member (PI Prof. Dominik Matt)
Duration: 20.11.2008 – 30.11.2011
Funding Body: UNIBZ CRC call
Budget unibz: € 21.000,00.

Commissioned Research/Industry grants (39 projects):

**2025-2026** **ADRF-1 – Axiomatic Design Research Foundation**
Role: Principal Investigator
Duration: 17.06.2025 – 31.12.2026
Funding Body: ADRF foundation, Cambridge, USA
Budget unibz: USD 10.000,00 (yearly funding)

**2025-2026** **AUTOTEST-2 – Scientific Support in Production Planning and Control**
Role: Principal Investigator
Duration: 07.08.2025 – 22.01.2026
Funding Body: LG-14
Budget unibz: € 18.750,00
Autotest GmbH, Franzensfeste

**2025-2025** **BRIGL-1 – Sustainable Innovation on the market and in the organization**
Role: Principal Investigator
Duration: 01.05.2025 – 31.08.2025
Funding Body: LG-14
Budget unibz: € 7.500,00
Nordpan AG, Olang

**2025-2025** **NOI-2 – Support in the development of DiSTT course offerings**
Role: Principal Investigator
Duration: 04.02.2025 – 30.06.2025
Funding Body:
Budget unibz: € 6.000,00
NOI Techpark Bolzano

**2025-2025** **NORDPAN-2 – Lifecycle Analysis (LCA) Gluelam2SPW**
Role: Principal Investigator
Duration: 21.08.2025 – 20.09.2025
Funding Body: LG-14
Budget unibz: € 3.200,00
Nordpan AG, Olang

**2025-2025** **RUBNER-HOLZBAU-1 – Lifecycle Analysis (LCA) Gluelam2GLT**
Role: Principal Investigator
Duration: 21.08.2025 – 20.09.2025
Funding Body: LG-14
Budget unibz: € 900,00
Rubner Holzbau AG, Brixen

**2025-2025** **BBT-SE-1 – Workshop/Training for Sustainability Management**
Role: Principal Investigator
Duration: 15.04.2025 – 15.07.2025
Funding Body: LG-14
Budget unibz: € 2.050,00
Brennerbasistunnel SE, Franzensfeste

**2025-2025** **TIP-TOP-1 – Value Stream Mapping for visualization and optimization of production**
Role: Principal Investigator
Duration: 15.04.2025 – 15.07.2025
Funding Body: LG-14
Budget unibz: € 18.000,00
Tip Top Fenster GmbH, Meransen

**2025-2025** **EUROCLIMA-1 – Scientific support for data-based CSRD sustainability reporting**
Role: Principal Investigator
Duration: 31.03.2025 – 31.12.2025
Funding Body: LG-14
Budget unibz: € 15.000,00
Euroclima AG, Bruneck

**2024-2027** **DUKA-PNRR - Monitoring sustainability performance in manufacturing for the digitalization of group-wide sustainability reporting**
Role: Principal Investigator
Duration: 01.11.2024 – 31.10.2027
Funding Body: industry funding PNRR doctorate 40. cycle

Budget unibz: € 27.700,00
Duka AG, Brixen

**2024-2026** **AES-3 – Scientific consulting, analysis and co-moderation in hackathon design, hackathon implementation, change process**
Role: Principal Investigator
Duration: 01.07.2024 – 31.12.2026
Funding Body: ERDF project Inmotion
Budget unibz: € 30.000,00
Automotive Excellence South Tyrol (AES)

**2024-2025** **PROGRESS-1 – Scientific support for data-based CSRD sustainability reporting**
Role: Principal Investigator
Duration: 01.12.2024 – 28.02.2025
Funding Body: /
Budget unibz: € 15.000,00
Progress Machine and Automation, Brixen

**2024-2025** **RIEPER-1 – Scientific support for data-based CSRD sustainability reporting**
Role: Principal Investigator
Duration: 20.09.2024 – 30.11.2025
Funding Body: /
Budget unibz: € 15.000,00
A. Rieper AG

**2024-2025** **IDM-1 – IDM-4 – Development of Sustainability Assessment for South Tyrol Sustainability Label**
Role: Principal Investigator
Duration: 01.05.2024 – 30.09.2025
Funding Body: /
Budget unibz: € 15.540,00
IDM Südtirol

**2024-2025** **LVH-1 – LVH-3 – Training Sustainability Assessment for South Tyrol Sustainability Label**
Role: Principal Investigator
Duration: 12.06.2024 – 31.03.2025
Funding Body: /
Budget unibz: € 6.710,00
Lvh-apa Südtirol (Confartigianato)

**2024-2024** **INTERCABLE-1 – Development of LCA Transport Routing Calculation Tool for ERP**
Role: Principal Investigator
Duration: 30.07.2024 – 31.12.2024
Funding Body: LG-14
Budget unibz: € 13.000,00
Intercable AG, Bruneck

**2024-2024** **NORDPAN-1 – Analysis and development of a bio-glue**

**solution for mono-use packaging**
Role: Principal Investigator
Duration: 01.05.2024 – 31.12.2024
Funding Body: LG-14
Budget unibz: € 15.000,00
Nordpan AG, Olang

**2023-2026** **FRAUNHOFER-PNRR - Resilience-Oriented Optimization of Modular and Reconfigurable Cyber-Physical Production Systems: A Complexity-Based Design Approach**
Role: Principal Investigator
Duration: 01.11.2023 – 31.10.2026
Funding Body: industry funding PNRR doctorate 39. cycle
Budget unibz: € 38.000,00
Fraunhofer Research Italia, Bozen

**2023-2026** **PROGRESS-PNRR - Development of a Data-based Sustainability Performance Measurement and Monitoring for ERP in the Precast Concrete Industry**
Role: Principal Investigator
Duration: 01.11.2023 – 31.10.2026
Funding Body: industry funding PNRR doctorate 39. cycle
Budget unibz: € 38.000,00
Progress Group, Brixen

**2023-2025** **PMA-1 - Digital Twin based kinematic and mechatronic modelling for testing and optimizing the performance and energy efficiency of machines**
Role: Principal Investigator
Duration: 01.01.2023 – 31.12.2025
Funding Body: LG-14
Budget unibz: € 54.000,00
Progress Group AG Brixen and Machineering GmbH Munich

**2018-2024** **Ha-Ka-1 – Training courses in the area of Twin Transition (digital & green)**
Role: PI
Duration: 01.04.2023 – 31.03.2026
Funding Body:
Budget unibz: € 31.960,00
Chamber of Commerce Bolzano

**2022-2023** **AES-1 – Feasibility Study for Live and Digital Carbon Footprint Tracking**
Role: PI
Duration: 01.11.2022 – 31.10.2023
Funding Body: LG-14
Budget unibz: € 27.000,00
Innovation Cluster Automotive Excellence South Tyrol.

**2022-2022** **NOI-1 – Implementation of a pilot application of a Sustainability Assessment**

Role: PI
Duration: 01.11.2022 – 31.12.2022
Funding Body: NOI Techpark South Tyrol
Budget unibz: € 7.200,00

**2022-2022** **GW-1 - Evaluation and proposal of robotic solutions for resistivity measurement and optimized layout scenarios**
Role: Co-Investigator
Duration: 01.07.2022 – 31.08.2022
Funding Body: LG-14
Budget unibz: € 8.000,00
Global Wafer Co. MEMC Electronic Materials S.p.A. – Sinich

**2021-2022** **TTM-1 - Adaptive Production Planning and Flexible Automation**
Role: Co-I (PI – Prof. Renato Vidoni)
Duration: 16.11.2021 – 31.08.2022
Funding Body: LG-14
Budget unibz: € 38.000,00
TTM - Thermo Tecno Management GmbH – Prad am Stilfser Joch

**2021-2022** **SAT – Development of a Sustainability Assessment Tool**
Role: Principal Investigator
Duration: 15.11.2021 – 31.03.2022
Funding Body: EEN – European Enterprise Network
Budget unibz: € 11.500,00
NOI Techpark AG, Forschungsförderungsgesellschaft Österreich FFG, Standortagentur Tirol, Oberösterreichische Wirtschaftsagentur, Steirische Wirtschaftsförderungs-gesellschaft

**2021-2021** **DIGIFAP – Digital factory planning and optimization for electric mobility component manufacturing**
Role: Co-I (PI Dr. Patrick Dallasega)
Duration: 18.08.2021 – 31.10.2021
Funding Body: NOI-Lab Bonus
Budget unibz: € 11.100,00
Intercable - Bruneck

**2021-2021** **DMI-1 – Industry 4.0 Assessment**
Role: PI
Duration: 01.06.2021 – 31.07.2021
Funding Body: NOI-Lab Bonus
Budget unibz: € 6.000,00
Doppelmayr Italia – Lana

**2021-2021** **DURST-1 – Automation concept for the production of a special nozzle**
Role: PI
Duration: 01.02.2021 – 30.06.2021

Funding Body: LG-14
Budget unibz: € 55.000,00
Durst Phototechnik – Brixen

**2020-2021** **SH-1 – Material flow simulation for warehouse automation**
Role: PI
Duration: 01.12.2020 – 21.04.2021
Funding Body: LG-14
Budget unibz: € 7.200,00
Sarner Holz – Sarnthein

**2020-2021** **ALPITRONIC-1 – Analysis of the Potential for Using Industry 4.0 Worker Assistance Systems in the Charging Station Assembly**
Role: PI
Duration: 15.09.2020 – 28.02.2021
Funding Body: LG-14
Budget unibz: € 20.000,00
Alpitronic - Bozen

**2021-2021** **SIM-EH-BZ II – Simulation Study of the Emergency Department in the Hospital of Bolzano**
Role: PI
Duration: 30.07.2021 – 29.09.2021
Funding Body: /
Budget unibz: € 5.000,00
Südtiroler Sanitätsbetrieb (SABES), Azienda Sanitaria dell'Alto Adige (ASDAA)

**2019-2019** **SIM-EH-BZ – Simulation Study of the Emergency Department in the Hospital of Bolzano**
Role: Co-I (PI Prof. Dominik Matt)
Duration: 01.07.2019 – 24.11.2019
Funding Body: /
Budget unibz: € 20.000,00
Südtiroler Sanitätsbetrieb (SABES), Azienda Sanitaria dell'Alto Adige (ASDAA)

**2018-2024** **SMF SEMINARS – Commissioned seminars of Smart Mini Factory**
Role: PI
Duration: 01.12.2018 – 31.05.2019
Funding Body: LG-14
Budget unibz: € 11.744,00

**2018-2019** **PROSTAHL – Collaborative robotics for the production of individual stainless steel furniture**
Role: PI
Duration: 01.01.2018 – 31.12.2024
Funding Body:
Budget unibz: € 12.000,00
Prostahl GmbH - Kaltern

**National and International collaboration**

National collaborations:

- Collaboration with **Fraunhofer Italia** Innovation Engineering Center IEC (Italy) in the field of research/publications and teaching in different projects/proposals (e.g. E-EDU 4.0, Assist4Work).
- Collaboration with Prof. Franco Fraccaroli and Maria Paola Paladino, Department of Psychology and Cognitive Science, **University of Trento** to prepare a research proposal for investigating psychological ergonomics in collaborative workspaces.
- Collaboration with Prof. Federico Brunetti from the **University of Verona** in the research project A21 Digital for developing the digitalization strategy of Veneto-SouthTyrol-NorthTyrol.
- Collaboration with Prof. Margherita Peruzzini from **Università degli Studi di Modena e Reggio Emilia** in the research project EyeTrack.
- Collaboration with Prof. Luca Pietrantoni and Dr. Federico Fraboni from **Università di Bologna** and Dr. Fabio Pini from **Università degli Studi di Modena e Reggio Emilia** in studying the cognitive ergonomics in human-robot collaboration (joint publications and research proposals).
- Collaboration with Prof. Rinaldo Rinaldi from the **University of Firenze** and Guido Cincinelli from **Leanprove A&C srl** in preparing a joint publication on collaboration stream mapping.
- Collaboration with Prof. Fiora Pirri from the **Sapienza University of Rome** in research (joint publication) on action forecasting in collaborative robotics.
- Collaboration with Prof. Carlo Gorla from **Politecnico di Milano**, Prof.ssa Francesca Maria Curà del **Politecnico di Torino** and Prof.ssa Giovanna Fargione dell'**Università degli Studi di Catania** in research preparing a research proposal on the characterization and industrialization of gear components through additive manufacturing technologies.
- Collaboration with Prof. Gabriele Arcidiacono from **G. Marconi University in Rome** in research on Axiomatic Design and healthcare system optimization (special issue and publications).
- Collaboration with Dr. Giulia Bruno from **Politecnico di Torino** in research on agile scheduling and simulation (joint publication).
- Collaboration with Dr. Taavi Vaimel and Ing. Carlos Paz Rocha from **Intercable srl** in research (joint publication) on the development of a vision based assistance system in assembly.
- Collaboration with Ing. Filippo Cividini from **Smart Robots srl Milan** in research (joint publication) on artificial intelligence based perception in human-robot collaboration.
- Collaboration with Ing. Andrea Ghedin from **Carretta srl** in research (joint publication) on the development of a human-robot collaboration work cell.

European collaborations:

- Collaboration with Prof. Helmut Zsifkovits, Dr. Manuel Woschank from **Montan University Leoben** in research (several publications) and preparing an Erasmus+ proposal.
- Collaboration with Prof. Michael Hofbaur from **Joanneum Research Robotics** in Klagenfurt in research on collaborative robotics (project CoHoMe).
- Collaboration with Vice-Dean Prof. Bernd Zunk from **Technical**

**University Graz** in the field of research (2 joint project proposals for EU projects).

- Collaboration with Prof. Gerhard Hilmer from **MCI Innsbruck** in teaching (contract lecturing on smart manufacturing)
- Collaboration with Prof. Fadi Donal from **UMIT Lienz** in teaching Industry 4.0 topics in an executive course for professionals in industry.
- Collaboration with Prof. Iva Kovacic from **Technical University of Vienna** preparing a research proposal for a FWF joint project.
- Collaboration with Dr. Fazel Ansari from **Technical University Vienna** in the IALF research working group on AI in manufacturing and preparing a joint article.
- Collaboration with Prof. Johannes Fottner and Dr. Dana Clauer from **Technical University Munich (fml)** in research on system design for autonomous guided vehicles in logistics (joint publications).
- Collaboration with Prof. Michael Friedrich Zäh, Dr. Susanne Vernim and Harald Bauer from **Technical University Munich (iwb)** in research (joint publication) and in the preparation of project proposals for a EU Horizon Europe RIA, VW Foundation and Joint DFG proposal.
- Collaboration with Prof. Christoph Lütge and Dr. Marjanne Thejls Ziegler from **Technical University of Munich (Institute for Ethics in Artificial Intelligence)** in research (joint publication) and the preparation of a EU project proposal.
- Collaboration with Prof. Mathias Hartmann and Prof. Wolfgang Dorner from **Deggendorf Institute of Technology** in the preparation of a DFG joint project on AI and digital twins.
- Collaboration with Prof. Burkhard Corves from **RWTH Aachen** in the preparation of a DFG joint project on redundancy in hybrid mobile robotics for smart factories.
- Collaboration with Prof. Peter Plapper from **University of Luxembourg** in the preparation of a FNR joint project proposal and in the research working group for HRC of IALF.
- Collaboration with Prof. Hartmut Zadek of the **Otto von Guericke University of Magdeburg** in teaching (Double Degree program of LM33) and research (H2020 proposal).
- Collaboration with Prof. Michael Freitag and Prof. Till Becker from **BIBA Bremer Institut für Produktion und Logistik GmbH and University of Bremen** in research on human factors in cyber-physical systems (Visiting PhD student Hendrik Stern).
- Collaboration with Professor Sven Seidenstricker from **Baden-Wuerttemberg Cooperative State University Moosbach (Germany)** and MSc. Robert Hammerl of the **University of Stuttgart (Germany)** in research.
- Collaboration with Prof. Daniel Hall from **ETH Zürich** in Switzerland in research (project SMF4INFRA – joint project) and the research institute **Eurotube Hyperloop**.
- Collaboration with Prof. Vladimir Modrak, Prof. Jan Pitel, Prof. Alexander Hošovský and Dr. Slavomir Bednar from **Technical University of Kosice** in research (project SME 4.0 and joint publications) and the preparation of several research proposals.
- Collaboration with the **Carinthia University of Applied Sciences, University of Antwerp, University of Porto, University of Oviedo, Slovak University of Technology Bratislava, EDUNET World Association** and **7 Thai Universities** in the Erasmus+ project ETAT.

- Collaboration with Prof. Vitalii Ivanov from **Sumy State University Ukraine** in the organization of DSMIE conference (co-editing the conference proceeding book).
- Collaboration with Prof. Katerina Adam from **National Technical University of Athens (NTUA)** in research (joint publication) and in preparing an Erasmus project proposal.
- Collaboration with Prof. Felipe M. Martin from **Universidad de Oviedo** in Spain in research (joint publication) on automation 4.0.
- Collaboration with Prof. Arkady Trachuk from **University under the Government of the Russian Federation** for a guest lecture on Digital Business Transformation and Industry 4.0.
- Collaboration with Prof. Christian Linder from **ESCP Europe Business School London** in research on human-centred manufacturing and Industry 4.0 in supply chain management (joint publications).
- Collaboration with Prof. Stevan Stankovski from **University Politehnica of Novi Sad** in Serbia, Prof. Cristian Mustata from **University Politehnica of Bucharest** in Romania, Prof. Carina Pimentel from **Universidade de Aveiro** in Portugal and Prof. Anabela Alves from **University of Minho** in Portugal in research (joint publication) on competence development through simulation.
- Collaboration with Dr. Sarah Hofmayr from **National University of Ireland Galway** in research on inclusive manufacturing and worker assistance systems (joint publication).
- Collaboration with Prof. Kerstin Johansen from **Jönköping University** in Sweden in research (special issue and panel discussion at IEOM 2022)
- Collaboration with Prof. Monica Bellgran and Dr. Seyoum Eshetu Birkie from **KTH Royal Institute of Technology –** Sustainable Production department in Sweden for setting up an Erasmus agreement as well as in research (special issue on smart, sustainable and resilient manufacturing).
- Collaboration with Prof. Emmanuel Francalanza and Prof. Jonathan Borg from **University of Malta** in research (joint publication, project ICARUS).
- Collaboration with Prof. Antonio Maffei from **KTH Royal Institute of Technology – Campus Stockholm,** Prof. Goran Putnik from **University of Minho** and Prof. Catalin Amza from **University Politehnica of Bucharest** in research and teaching (Erasmus+ project ICARUS, joint publications, joint research proposals).
- Collaboration with Prof. Tauno Otto and Dr. Tanel Aruväli from **Tallin University of Technology** in Estland in research (joint publication) on resilience in manufacturing through worker assistance systems.
- Collaboration with Dr. Helena Hashemi Farzaneh from TUM and **General Electric (GE) Additive Munich** in research (joint publication) on biological transformation in manufacturing.
- Collaboration with Dr. Marco Prüglmeier from **BMW AG Munich** in research (joint publication) on axiomatic design for autonomous mobile robots.

<u>International collaborations:</u>

- Collaboration with Prof. Nam P. Suh and Prof. Sang G. Kim from **Massachusetts Institute of Technologies (MIT)** in USA in research (book projects, special issue) and in teaching (summer schools and tutorials of Axiomatic Design).

- Collaboration with Prof. Chris Brown from **Worcester Polytechnic Institute (WPI)** in USA in research (several joint publications) and teaching (summer schools and tutorials) of Axiomatic Design.
- Collaboration with Prof. Joseph Sarkis from **Foisie Business School** in USA in research (joint book project on Industry 4.0 and Supply Chain Management)
- Collaboration with Prof. David Cochran from the Excellence Center in Systems Engineering at **Purdue University, USA** in research on sustainable manufacturing for SMEs (project Sustainable SMEs 4.0, guest lecture, joint publications).
- Collaboration with Prof. Carlos Antonio Meisel from **Universidad de Ibagué, Colombia** in the coordination and organization of the 1st International Summer School on Axiomatic Design for Industry 4.0.
- Collaboration with Prof. Korrakot Tippayawong and Prof. Wasawat Nakkiew from **Chiang Mai University** in Thailand in research (project SME 4.0, joint publications), for researcher exchange (hosting several visiting students) and for supporting to set up a learning factory lab at CMU.
- Collaboration with Prof. Prajaks Jitngernmadan from **Burapha University** in Thailand in research (joint publication) on automation 4.0.
- Collaboration with Dr. Nirut Naksuk from the **National Metal and Materials Technology Center (MTEC) at Bangkok Science Park** in researcher exchange.
- Collaboration with Dr. Steven Umbrello from **Institute for Ethics and Emerging Technologies, Boston, USA** in research (joint publication) and to prepare research proposals for investigating ethical aspects of Industry 4.0.
- Collaboration with Prof. Chiang Tsun-Li from from **Deakin University in Australia,** for preparing an EU MSCA research proposal, based on his experience on cybersecurity.
- Collaboration with **17 international experts from academia, industry and government** leading the focus group on AI in Manufacturing for the World Manufacturing Forum 2021.

**Research stays abroad**

- 06/2024-08/2024 **Visiting Research Scholar** in the EU project SME 5.0 – **Chiang Mai University**. Collaboration with Prof. Wasawat Nakkiew for preparing an Erasmus+ proposal.
- 06/2019-09/2019 **Visiting Research Scholar** in the EU project SME 4.0 – **Worcester Polytechnic Institute (WPI)**, Worcester Massachusetts (USA). Collaboration with Prof. Chris Brown and Prof. Joseph Sarkis (WPI) as well as Prof. Sang Gook Kim of Massachusetts Institute of Technology (MIT).
- 06/2018 and 06/2019 **Visiting Research Scholar** in the EU project SME 4.0 – **ELCOM sro**, Presov, Slovakia. Collaboration with Prof. Vladimir Modrak and Prof. Jan Pitel from Technical University of Kosice in case study research with the company Elcom.
- 11/2017-02/2018 **Visiting Research Scholar** in the EU project SME 4.0 at **Chiang Mai University and Bangkok Science Park** (Thailand). Collaboration with Prof. Korrakot Tippayawong, Prof. Wasawat Nakkiew and Dr. Nirut Naksuk from National Science and Technology Development Agency in Bangkok.
- 09/2017-11/2017 **Visiting Research Scholar** in the EU project SME 4.0 – **Worcester Polytechnic Institute (WPI)**, Worcester Massachusetts

(USA). Collaboration with Prof. Chris Brown and Prof. Joseph Sarkis (WPI) as well as Prof. Sang Gook Kim of Masschussetts Institute of Technology (MIT).

**Participation in exhibition events**

- Yearly participation at **Open Days** and **Science Live** events of unibz with demonstrators of the Smart Mini Factory Lab
- Participation of the Sustainable Manufacturing Lab at the **"DRIVE2TRANSFORM Automotive Transformation Conference" at NOI Bruneck** with an exhibition and demonstration of demonstrators, October 24-25 2025.
- Participation of the Sustainable Manufacturing Lab at the "**INMOTION Tech Festival 2025" at NOI Bruneck** with an exhibition and demonstration of demonstrators, May 10 2025.
- Participation of the Sustainable Manufacturing Lab at the "**INMOTION Tech Festival 2024" at NOI Bruneck** with an exhibition and demonstration of demonstrators, October 26 2024.
- Participation of the Sustainable Manufacturing Lab at the "**International Forum Mechatronik" at NOI Bruneck** with an exhibition and demonstration of demonstrators, September 28-29 2023.
- Participation of the Smart Mini Factory at the "**TechParcour Handwerk 2021" at NOI** with an exhibition and demonstration of Augmented Reality and assistance systems, August 30 2021.
- Coordination of the participation of the Smart Mini Factory at the "**TechParcour Handwerk 2020" at NOI** with an exhibition and demonstration of collaborative robotics, Augmented Reality and assistance systems, July 24 2020.
- Participation of the Smart Mini Factory at the "**EOS Digital Enterprise Day" at Castel Maretsch** with a demonstration of collaborative robotics and a talk on Industry 4.0, October, 17-18 2019.
- Coordination of the participation of the Smart Mini Factory at the "**TechParcour Handwerk 2019" at NOI** with an exhibition and demonstration of collaborative robotics, Augmented Reality and assistance systems, July 26 2019.
- Participation at the "**LUNA - Long night of the research 2019**" with an exhibition and demonstration in the Smart Mini Factory laboratory titled "Smart Factory".
- Coordination of the participation of the Smart Mini Factory at the "**SPC IPC Drives Parma 2018 – Cultura 4.0" at the fair of Parma** with a stand of the Smart Mini Factory lab, May 22-24 2018.
- Coordination of the participation of the Smart Mini Factory at "**Handwerk 2030" at NOI** with an exhibition and demonstration of Industry 4.0 technologies, July 13 2018.
- Participation at the "**LUNA - Long night of the research 2016**" with an exhibition and demonstration in the Smart Mini Factory laboratory titled "Hybrid assembly and human-robot collaboration".
- Participation at the "**Research Day 2015**" at the Free University of Bolzano (October 2015) on the topic: "Industry 4.0 - the intelligent and smart factory" - exhibition of actual research activities.
- Participation at the "**LUNA - Long night of the research 2014**" with an exhibition and demonstration in the "mini-factory"-laboratory titled "Simulation and optimization of manual assembly processes in the mini-factory!".
- Participation at the "**LUNA - Long night of the research 2012**" with

an exhibition and demonstration in the "mini-factory"-laboratory titled "How to increase productivity in the variant-driven production".

- Participation at the "**LUNA - Long night of the research 2010**" with an exhibition and demonstration titled "From a product idea to a finished product – Planning, simulation and realization of industrial production processes". Demonstration of material-flow simulation case studies with FlexSim Simulation software.

**Key Note/ Panel speeches**

- **12 Keynotes; 11 Panel Speaker Sessions**
- **Keynote Speaker at EXPAT 2025** – Keynote on "Digital Twin Technologies for Smart and Sustainable Factories", September 3, 2025, Horta-Azores, Portugal.
- **Keynote Speaker at 55th year Celebration of the Faculty of Engineering at Chiang Mai University** – Keynote on "Learning Factories for project- and problem-based Engineering Education", June 3, 2025, Chiang Mai, Thailand
- **Keynote Speaker and Panel Session Speaker at IASP 2025** – Keynote on "Smart and Sustainable Manufacturing in South Tyrol", May 9, 2025, Bolzano, Italy
- **Keynote Speaker at ICIEA 2025 Europe** – Keynote on "The Sustainable Factory: Strategies and Challenges for a Green Transition of Industry", January 8, 2025, Munich, Gemany
- **Keynote Speaker at V-MAE 2024** – Keynote on "SME 5.0 – Introduction of Industry 5.0 in Small and Medium Sized Enterprises", April 12, 2024, virtual conference.
- **Keynote Speaker at IEOM 2023** – Keynote on "Twin Transition towards Smart and Sustainable Manufacturing", December 27, 2023, Bangladesh, India.
- **Keynote Speaker at V-MECH 2023** – Keynote on "Twin Transition towards Smart and Sustainable Manufacturing", November 10, 2023, virtual conference.
- **Keynote Speaker at MMM 2023** – Keynote on "Twin Transition towards Smart and Sustainable Manufacturing – Double challenge or double chance?", May 2, 2023, Tallinn, Estonia.
- **Keynote Speaker at PROGRESS Sustainability and Innovation Summit 2023** – Keynote on "Towards Sustainable Production: Circular Economy, Decarbonization, and Beyond?", October 5-6, 2023, Brixen, Italy.
- **Keynote Speaker at Hong Kong Polytechnic University** – Keynote on "Unlocking the Potential of the Twin Transition towards Smart and Sustainable Manufacturing", February 17, 2023, Hong Kong, China.
- **Panel Chair and speaker at IEOM 2022** – Panel chair and speaker in the panel session on "Transition to Human-Centric and Resilient Manufacturing", July 27, 2022, Rome, Italy.
- **Panel speaker at the event Cusanus.Dialog – Climate Neutral Europe: How Industry is Meeting the Challenge** – panel discussion presenting first results of a sustainability assessment for industry, May 19, 2022.
- **Panel speaker at the event Trend Dialog in the project Talentregion Dolomit Live** – panel discussion on the future of industrial production, January 18, 2022.
- **Panel speaker at the World Manufacturing Forum 2021** –

presentation of the White Paper on "AI as an enabler for long-term resilience in manufacturing", October 20, 2021, Cernobbio, Italy.

- **Panel Chair and speaker at IEOM 2021** – panel chair and speaker in the session on Industry 4.0, August 4, 2021, online, Rome, Italy.
- **Panel speaker at ISPIM Innovation Conference 2021** – panel speaker in the session on Industry 5.0 – The Next Frontier, June 21, 2021, online, Berlin, Germany.
- **Panel speaker at EU Tech Chamber Advanced Manufacturing Council** – panel speaker in the session on Importance of Big Data in Advanced Manufacturing, April 9, 2021.
- **Panel-Speaker at the 11th International Conference on Industrial Engineering and Operations Management (IEOM 2021)** – panel speaker in the session on Global Engineering Education with a talk and panel-discussion about learning factories for teaching Industry 4.0, March 9, 2021, online, Singapore.
- **Key Note Speaker at TED´s 2020** – Key note presentation with the title "The second phase of Industry 4.0: the role of artificial and biological intelligence in manufacturing", Conference on Technology & Entrepreneurship in Digital Society, November 10, 2020, Moscow, Russia.
- **Panel Speaker at ESOF EuroScience Open Forum 2020** – panel presentation at largest interdisciplinary meeting on science and innovation in Europe in Trieste titled "Transfer of Industry 4.0 to Small and Medium Sized Enterprises", September 2-6, 2020, Trieste, Italy.
- **Key Note Speaker at DSMIE 2020** – Key note presentation with the title "Industry 4.0+: A look at the next level of intelligent and self-optimizing factories", 3rd International Conference on Design, Simulation, Manufacturing (DSMIE-2020), June 9-12, 2020, Kharkiv, Ukraine.

**Invited talks**

- **Invited Speaker at Event of Raiffaisenkasse Südtirol** "Enterprises of the future – Sustainability in the focus", presentation with the title „Guidelines and Best-Practice Examples for Circular Economy", October 7, 2025, Bozen, Italy.
- **Invited Speaker at European Forum Alpach**, presentation with the title „Futures of Intelligence and Data-driven Innovation in the Manufacturing Industry", August 17, 2025, Alpbach, Austria.
- **Invited Speaker at Event of Confindustria** "Zukunft der Logistik: Automatisierung durch KI meistern", presentation with the title „Automation and AI in Logistics", May 13, 2025, Neumarkt, Italy.
- **Invited Speaker at Bildungsausschuss Auer**, presentation with the title „KI im Unternehmen – Chancen und Anwendungen", October 29, 2024, Auer, Italy.
- **Invited Speaker at Digital Innovation Talks of Confindustria Alto Adige**, presentation with the title „Digitaler Zwilling in der Produktion zur Steigerung von Effizienz und Nachhaltigkeit", October 24, 2024, Bozen, Italy.
- **Invited Speaker at Event of Südtiroler Wirtschaftsring SWR**, presentation with the title „Smarte und nachhaltige Produktion", September 23, 2024, Bruneck, Italy.
- **Invited Speaker at Confindustria Pustertal event"**, presentation with the title „ Sustainability Reporting – what you should know about it", April 22, 2024, Bruneck, Italy.
- **Invited Speaker at Rotary Invited Speaker at Unternehmerforum Bruneck"**, presentation with the title „ KI als

Befähiger für eine nachhaltigere Produktion", April 8, 2024, Bruneck, Italy.

- **Invited Speaker at Rotary Club"**, presentation with the title „AI – What is AI and how we can benefit from it?", March 14, 2024, Neustift, Italy.
- **Invited Speaker at Wirtschaftsstammtisch Bruneck,** presentation with the title "Nachhaltigkeit von Produkten und in der Herstellung: Chancen für die lokale Wirtschaft", January 29, 2024, Bruneck, Italy.
- **Invited Speaker at Rotary Club"**, presentation with the title „ Duale Transformation der Arbeitswelt – Smarte und nachhaltige Konzepte", December 12, 2023, Brixen, Italy.
- **Invited Speaker at Autumn Event of Confindustria Alto Adige**, presentation with the title „Challenges for a sustainable production of the future", November 10, 2023, Bruneck, Italy.
- **Invited Speaker at International Forum Mechatronik 2023"**, presentation with the title „SUSTAINABILITY-CHECKUP - A Sustainability Assessment Tool for SME Companies", September 28, 2023, Bruneck, Italy.
- **Invited Speaker at Event of Chamber of Commerce "Nachhaltigkeit und KMUs"**, presentation with the title „Nachhaltigkeit ist nicht nur Umweltschutz: Vorteile von nachhaltigem Wirtschaften für KMU", October 19, 2023, Bozen, Italy.
- **Invited Speaker at NOI Day 2022**, presentation with the title „Von der Smart Mini Factory zum Digitalen Zwilling in der Produktion", October 20, 2022, Bozen, Italy.
- **Invited Speaker at NOI Event "Potenziale nutzen"**, presentation with the title „Smart Mini Factory – a laboratory for Industry 4.0", September 29, 2022, Lana, Italy.
- **Invited Speaker at Digital Day 2022**, presentation with the title „Digitalisierung als Befähiger für Nachhaltiges Wirtschaften", September 21, 2022, Bolzano Sheraton, Italy.
- **Invited Speaker at Dolomiti LIVE Workshop Sustainable Production in Automotive**, presentation with the title „ Reusability and Retrofitting of Production Systems", May 20, 2022, Bolzano, Italy.
- **Invited Speaker at IPEC 2022 (International Production Environmental Community)**, presentation with the title „AI as an enabler for long term resilience and sustainability in manufacturing", March 8, 2022, Nürnberg, Germany. Organized by IHK Nürnberg and Institute for Sustainability.
- **Invited Speaker at the Annual Meeting of the Italian Association of Ceramics 2021**, presentation with the title „ Dual Transformation - the digital and sustainable transformation in manufacturing", December 10, 2021, online, Italy.
- **Invited Speaker at SCET-NET event - Senza Confini Education and Training Network**, presentation with the title "Digital technologies and university skills", April 22, 2021.
- **Invited Speaker at Webinar - New skills and professionalism to support the digitalization process of SMEs** organized by the Chamber of Commerce Treviso- Belluno, presentation with the title "Evolution of the processes of digitalization of SMEs", April 20, 2021.
- **Invited Speaker at Online Event - DIGITAL COMPETENCIES: How the roles and approaches of trainers and teachers are changing** organized by t2i - trasferimento tecnologico e innovazione, presentation

with the title "Engineering Education Training Activities at unibz", March 29, 2021.

- **Invited Speaker at the Annual Meeting of the Italian Association of Ceramics 2020**, presentation with the title „Industry 4.0+ - the next challenge for industry", September 14, 2020, online, Italy.
- **Invited Speaker at "Der Mensch steht wieder im Mittelpunkt" - 10 Years of Fraunhofer Italia**, presentation with the title „Socially Sustainable Production", January 16, 2020, NOI Techpark Bolzano, Italy.
- **Invited Speaker at Cluster Event of the European Commission**, presentation with the title "Chances of Artificial Intelligence and Machine Learning for SMEs", December 10 2019, Brussel, Belgium.
- **Invited Speaker and Workshop Leader "Collaborative Robotics and Workplaces" - Digital Talent Day 2019**, Chamber of Commerce Bolzano, December 9 2019.
- **Invited Speaker at Workshop on Industry 4.0**, October 25 2019, presentation with the title "Industry 4.0 nella produzione e logistica" organised by Confindustria Macerata.
- **Invited Speaker at seminar on the integration of people with disabilities into the labour market,** Municipality of Bolzano, October 4 2019, title "Worker Assistance Systems for a better integration of disabled people in industrial companies".
- **Invited Speaker PhD Seminar Worcester Polytechnic Institute, Foisie Business School,** September 4 2019, Title "With Industry 4.0 towards the Smart and Digital Factory of the Future.
- **Speaker Executive Management Board meeting Chiang Mai University, Faculty of Engineering (Thailand)**, December 10 2018, Title "Industry 4.0 - Challenges and opportunities to rethink on higher education".
- **Speaker and moderator to the 1st Digital Laboratory of Confindustria Marche (Italy)**, October 18 2018, presentation with the title "Industry 4.0 for production and logistics" and moderation of round table discussion, organised by Confindustria Marche and Federmanager.
- **Speaker at MCI Management Center Innsbruck (Austria), WING-Kaminabend** May 11 2018. Presentation with the title "Innovative Aspects in Production Planning & Management".
- **Speaker at the Digital Day (Italy),** May 11 2018, round table discussion on Digitalization and Industry 4.0, organised by the Chamber of Commerce of Bolzano.
- **Speaker in a Workshop at Wirtschaftskammer Lienz (Austria),** January 25 2018, discussion on future Engineering Education, organised by Innos.
- **Speaker at the Student Award Ceremony at WPI (USA)**, November 13 2017, speech and Question-Answer-session on "Industry 4.0 – the new industrial revolution in Europe", organised by the SME (Society of Manufacturing Engineers) chapter in Worcester, MA.
- **Speaker at the round table of CV Forum 2017** (Italy), July 7 2017, congress of the Triveneto Accountants. Round table discussion on the topic of "Industry 4.0 and the profession of Accountants", moderated by Il Sole24ore journalist Katy Mandurino.
- **Speaker at the University of Malta (Malta)**, June 2 2017, seminar on Digital Factories for Innovative Product Development. Title "Industry 4.0 and Digitalisation -a challenge for SMEs".
- **Speaker at MCI Management Center Innsbruck (Austria), WING-**

**Kaminabend** September 25 2015. Title "From Lean Management to Smart Factory - The role of the engineer in the era of Industry 4.0, CPS and IoT.

- **Speaker at the Research Day 2015** at Bozen-Bolzano with the following presentation "Industry 4.0 - the intelligent and smart factory".
- **Speaker at the "Start-up Aperitifs" (Italy)**, May 28 2013 organised by the Chamber of Commerce of Bolzano. Title "Growing as an entrepreneur - Today's challenges".
- **Speaker invited to the round table (Italy)** on the topic "Ethics in business? And exists!" Published in "forum-schule-heute", No. 2, 2013.
- **Speaker "Treffpunkt Wirtschaft 2012" (Italy)**, 6 July 2012 organised by the Chamber of Commerce of Bolzano. Title "Companies in change - growth in organisation and processes".

**Presentation at conferences**

- **International Conference for Learning Factories (CLF 2025),** Stellenbosch, South Africa – presentation of 1 conference paper
- **International Conference on Industry of the Future and Smart Manufacturing (ISM 2025),** Valletta, Malta – presentation of 1 conference paper
- **International Conference for Axiomatic Design ICAD 2025** Cardiff, UK – presentation of 1 conference paper
- **International Conference SMILE 2025** Casablanca, Marocco – editor workshop, presentation of guidelines for academic publication.
- **International Conference on Design, Simulation, Manufacturing DSMIE 2024** Pilzen, Poland – presentation of 1 conference paper
- **20th International Conference on Remote Engineering and Virtual Instrumentation (REV2023) and International Edunet World Conference (IEWC 2023),** Thessaloniki, Greece – presentation of 1 conference paper
- **International Conference for Axiomatic Design ICAD 2023** Eindhoven, Netherlands – presentation of 1 conference paper
- **International Conference on Design, Simulation, Manufacturing DSMIE 2023** High Tatras, Slovakia – presentation of 1 conference paper
- **European Professors for Industrial Engineering and Management (EPIEM) Conference 2022**, Graz, Austria – presentation of 1 conference paper
- **International Conference on Design, Simulation, Manufacturing DSMIE 2022** Poznan, Poland – presentation of 1 conference paper
- **International Conference on Industry 4.0 and Smart Manufacturing (ISM) 2021**, Linz, Austria – presentation of 1 conference paper.
- **European International Conference on Industrial Engineering and Operations Management (IEOM) 2021**, Rom, Italy – presentation of 1 conference paper
- **International Conference on Industrial Engineering and Operations Management (IEOM) 2021**, Singapore,– presentation of 1 conference paper
- **International Conference on Flexible Automation and Intelligent Manufacturing 2021**, Athen, Greece – presentation of 1 conference paper
- **14th EPIEM Conference 2021,** Graz, Austria – presentation of 2 conference papers
- **International Conference on Design, Simulation, Manufacturing**

**DSMIE 2021** Kharkiv, Ukraine – presentation of 1 conference paper

- **International Conference CIRPe 2020** Leuven, Belgium - presentation of 2 conference papers
- **International Conference on Axiomatic Design (ICAD) 2019** Sydney, Australia - presentation of 3 conference papers
- **CIRP Learning Factories 2019** Braunschweig, Germany - presentation of 1 conference paper
- **IEEE International Conference on Industrial Engineering and Engineering Management (IEEM) 2018** Bangkok, Thailand – presentation of 3 conference papers
- **International Conference on Axiomatic Design (ICAD) 2018** Reykjavik, Iceland - presentation of 2 conference papers
- **CIRP Learning Factories 2017** Darmstadt, Germany – presentation of 1 paper
- **CIRP Design 2016** Stockholm, Sweden – presentation of 1 paper
- **CIRPe Web Conference 2015** Cranfield, UK – presentation of 1 conference paper
- **CIRP Conference on Life Cycle Engineering (LCE) 2015** Sydney, Australia – presentation of 2 conference papers
- **International Conference on Production Research (ICPR) 2014** Cluj-Napoca, Romania – presentation of 2 conference papers
- **CIRP Conference on Manufacturing Systems (CMS) 2014** Windsor, Canada – presentation of 2 conference papers
- **Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV)** Munich, Germany – presentation of 2 conference papers
- **AITEM 2013** Ancona, Italy - presentation of 1 conference paper
- **CIRP Conference on Intelligent Computation in Manufacturing Engineering (ICME) 2012** Naples, Italy - presentation of 2 conference papers
- **International Conference on Sheet Metal (SHEMET) 2011** Leuven, Belgium – presentation of 1 conference paper
- **International Multi-Conference on Engineering and Technological Innovation (IMETI) 2010** Orlando, FL, USA – presentation of 1 conference paper
- **CIRP Conference on Intelligent Computation in Manufacturing Engineering (ICME) 2010** Naples, Italy – presentation of 2 conference papers
- **Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV) 2009** Munich, Germany – presentation of 2 conference papers

**Awards and Recognitions in Research**

- **Stanford University's list of the World's Top 2% Scientists,** within the 0.8% of top scientists worldwide in the field of Industrial Engineering
- **Outstanding Professor in Sustainable Manufacturing Award 2023 –** 6th International Conference on Industrial Engineering and Operations Management Conference (IEOM 2023). Bangladesh, December 26-28, 2023
- **Outstanding Paper Award**, International Symposium on Industrial Engineering (ISIEA 2022).
- **Top 100 Industry 4.0 Thought Leader** in the 2021 Onalytica Who's Who report on Industry 4.0 (https://onalytica.com/wp-content/uploads/2021/06/Whos-Who-In-Industry-4.0.pdf).

- **Expert for the World Manufacturing Foundation (WMF) Report 2020** on the topic "Manufacturing in the Age of Artificial Intelligence.
- **Outstanding Professor in Industry 4.0 Award 2021 –** 4th European Industrial Engineering and Operations Management Conference (IEOM 2021). Rome, Italy, August 2-5, 2021
- **ADRF Park's Prize 2019-20** sponsored by the Axiomatic Design Research Foundation (ADRF).
- **South Tyrolean Research Award 2019**, awarded on December 19, 2019 in Bolzano, Italy (NOI TechPark).
- **Best Student Paper Award** for the paper "Smart Data Analytics in SME Manufacturing – an Axiomatic Design based Conceptual Framework", ICAD 2019, 13th International Conference on Axiomatic Design. Sydney, Australia, October 18-20, 2019.
- **Best Track Paper Award (Track Industry 4.0)** for the paper "Suitability of Industry 4.0 Concepts for Small and Medium Sized Enterprises: Comparison between an Expert Survey and a User Survey", IEOM 2019 9th International Conference on Industrial Engineering and Operations Management. Bangkok, Thailand, March 5-7, 2019.
- **Outstanding Paper Award** for the paper "Advanced Automation for SMEs in the I4.0 Revolution: Engineering Education and Employees Training in the Smart Mini Factory Laboratory", IEEM 2018 International Conference on Industrial Engineering and Engineering Management. Bangkok, Thailand, December 16-19, 2018.
- **Best Track Paper Award (Track Engineering Education)** for the paper "Safe Human-Machine Centered Design of an Assembly Station in a Learning Factory Environment", IEOM 2018 8th International Conference on Industrial Engineering and Operations Management. Bandung, Indonesia, March 6-8, 2018.
- **Best Track Paper Award (Track Sustainability in Supply Chain)** for the paper "Sustainable City Logistics through Shared Resource Concepts", IEOM 2018 8th International Conference on Industrial Engineering and Operations Management. Bandung, Indonesia, March 6-8, 2018.
- **Best Track Paper Award (Track Construction Management)** for the paper "Mobile On-site Factories – Scalable and Distributed Manufacturing Systems for the Construction Industry", IEOM 2015 5th International Conference on Industrial Engineering and Operations Management. Dubai, United Arab Emirates, March 3-5, 2015.
- **Overall Best Paper Award** for the paper "An AD based Design and Implementation Approach for Franchise-Networks with distributed manufacturing units", ICAD 2013 Seventh International Conference on Axiomatic Design. Worcester, USA, Juni 27-28, 2013.
- **Nomination for best dissertation 2013** – University of Stuttgart.

**Memberships**

- **AITEM** – Regular member of Associazione Italiana di Tecnologie Maufatturiere (Italian Association of Manufacturing Technologies, Ing-Ind/16 sector).
- **EuroScience** – Associate Member of European Association for the Advancement of Science and Technology, organizer of ESOF Euro Science Open Forum as the largest biennial interdisciplinary meeting on science and innovation in Europe. Session coordination at ESOF 2020 in Udine, Italy.
- **World Manufacturing Foundation** – expert in the World

Manufacturing Forum, focus group leader for the coordination of the White Paper "AI as an enabler for long-term resilience in manufacturing" for the World Manufacturing Forum 2021.

- **International Association of Learning Factories (IALF)** – Since 2020 the Smart Mini Factory Lab is official member of the IALF network. Erwin Rauch was member of the Scientific Committee and is member of the following working groups: (1) Digital Assistance Systems for Assembly, (2) AI for Manufacturing Systems, (3) Human-Robot Collaboration.
- **International Association of Axiomatic Design (IAAD)** – Member of the Executive Committee and Head of the Publication Committee (responsible for scientific publications and conference proceedings).
- **International Society for Engineering Pedagogy (IGIP)** – Member of the International Advisory Board
- **European Professors of Industrial and Engineering Management (EPIEM)** – Steering Board member and coordinator of research projects in EPIEM.
- **International Association for Technological Development and Innovations (IATDI)** – Member, keynote speaker in DSMIE conference in 2020 and Co-Editor of Conference Proceedings of DSMIE 2022.
- **EDUNET World Association** – Regular member. Association for promoting engineering education 4.0 in automation technology.
- **Marie Curie Alumni Association (MCAA)** – Regular Member.

**Editorial activity**

- **Editor in Chief** of Production & Manufacturing Research (Taylor & Francis) (ISSN 2169-3277), Scopus Q2, impact factor 3.5.
- **Editorial Board member** of Scientific Reports (Nature) (ISSN 2045-2322), inaugural member of the new Mechanical Engineering division, Scopus Q1, impact factor 5.133.
- **Editorial Board member** of Sustainability (MDPI), ISSN 2071-1050, Scopus Q2, impact factor 3.251.
- **Editorial Board member** of International Journal of Technoethics (IGI Global), ISSN 1947-3451, Scopus Q2, impact factor 0.87.
- **Editorial Board member** of Journal of Engineering Sciences, ISSN 2312-2498, Scopus Q2
- **Editorial Board member** of Proceedings on Engineering Sciences (University of Kragujevac), ISSN 2620-2832, Scopus Q3.
- **Editorial Board member** of Strategic Decisions and Risk Management, ISSN 2618-947X
- **Editorial Board member** of Frontiers in Control Engineering, specialty section Control and Automation Systems, ISSN 2673-6268.

**Guest Editor:**

- **Guest Editor for the Special Issue** "Implementing SDG 9 Through Industry 5.0: Sustainable Innovations for Future Smart and Sustainable Factories" – Production & Manufacturing Research (Taylor &Francis), Q2, Impact Factor 3.5, ongoing, closes 31 December 2025. Guest Editors: Prof. Erwin Rauch – Free University of Bolzano, Italy; Dr Mélanie Despeisse, Chalmers University of Technology, Sweden; Dr. Andrea Trianni, University of Technology Sydney, Australia; Dr. Matteo De Marchi, Free University of Bozen-Bolzano, Italy; Dr. Rafiq Ahmad, University of Alberta, Canada.
- **Guest Editor for the Special Issue** " Design Methods for Mechanical

and Industrial Innovation" – Machines (MDPI), Q2, Impact Factor 2.428, ongoing, closes 31 March 2023. Guest Editors: Prof. Alessandro Giorgetti - Università degli Studi Rome, Italy; Prof. Gabriele Arcidiacono – Giuglielmo Marconi University, Italy; Prof. Christopher Brown – Worcester Polytechnic Institute, USA; Prof. Erik Puik – University of Applied Sciences Utrecht, Netherlands; Prof. Dr. Nakao Masayuki – University of Tokio, Japan; Dr. Erwin Rauch – Free University of Bolzano, Italy.

- **Managing Guest Editor for the Special Issue** "Next Generation of Smart, Sustainable and Resilient Manufacturing Systems" – Scientific Reports (Nature), Q1, Impact Factor 5.133, ongoing, closes 31 December 2022. Guest Editors: Dr. Erwin Rauch – Free University of Bolzano, Italy; Prof. David S. Cochran – Purdue University, Fort Wayne, USA; Prof. Kerstin Johansen – Jönköping University, Sweden; Dr. Susanne Vernim – Technical University of Munich, Germany.
- **Guest Editor for the Special Issue** "Modern Automation Technologies and Virtual Engineering for Sustainable Manufacturing" – International Journal of Reliability, Quality & Safety Engineering (IJRQSE), Q3, ongoing, closes 1 August 2022. Guest Editors: Prof. Brian Prasad – Knowledge Solution, USA; Prof. J. Paulo Davim – University of Aveiro, Portugal; Dr. Erwin Rauch – Free University of Bolzano, Italy and Dr. Tao Peng – Zhejiang University, China.
- **Managing Guest Editor for the Special Issue** "Design for Sustainability—Axiomatic Design Science and Applications" – Sustainability (MDPI), Q2, Impact Factor 3.251, ongoing, closes 30 September 2022. Guest Editors: Dr. Erwin Rauch and Prof. Dominik Matt – Free University of Bolzano, Italy; Prof. Nam Suh – MIT Masschussetts Insitute of Technology, USA; Prof. Miguel Cavique – Nova University Lisbon, Portugal; Prof. Christopher Brown – Worcester Polytechnic Institute, USA; Prof. Gabriele Arcidiacono – Giuglielmo Marconi University, Italy.
- **Guest Editor for the Special Issue** "Unlocking the Potential of Sustainable and Circular Manufacturing Through Digitalization" – IEEE Engineering Management Review (IEEE), Q4, Impact Factor 1.587, ongoing, closed 1 June 2022. Guest Editors: Prof. Johannes Fottner, Prof. Michael F. Zaeh, Prof. Magnus Froehling, Dr. Susanne Vernim – Technical University Munich, Germany; Dr. Erwin Rauch – Free University of Bolzano, Italy and Dr. Seyoum Eshetu Birkie – KTH Royal Institute of Technology, Sweden.
- **Managing Guest Editor for the Special Issue** "Industry 4.0 for SMEs - Smart Manufacturing and Logistics for SMEs" – Sustainability (MDPI), Q2, Impact Factor 3.251, closed 31 March 2020. Guest Editors: Dr. Erwin Rauch – Free University of Bolzano, Italy and Dr. Manuel Woschank – Montanuniversität Leoben, Austria.

**Book Editing:**

- **Book Co-Editor** of the book "Manufacturing 2030 - A Perspective to Future Challenges in Industrial Production", Lecture Notes in Networks and Systems (Springer), to be published in October 2025, ISSN 2367-3370.
- **Book Co-Editor** of the book "Advances in Design, Simulation and Manufacturing VII - Manufacturing Engineering" (Springer), published in 2024, ISBN 978-3-031-61796-6.
- **Book Co-Editor** of the book "Managing and Implementing the Digital

Transformation", Lecture Notes in Networks and Systems (Springer), 2022, ISSN 2367-3370.

- **Book Co-Editor** of the book "Advances in Design, Simulation and Manufacturing - Manufacturing and Materials Engineering" (Springer), published in 2022, ISBN 978-3-031-06025-0.
- **Book Co-Editor** of the book "Industry 4.0 for SMEs - Smart Manufacturing and Logistics for SMEs" (MDPI), published in 2020, ISBN 978-3-03936-567-8.

**Reviewer activity**

- International Journal of Information Management (Elsevier) 14.098
- Trends in Food Science & Technology (Elsevier) 12.563
- Journal of Industrial Information Integration (Elsevier) 10.063
- Journal of Cleaner Production (Elsevier), impact factor 9.297
- Journal of Manufacturing Systems (Elsevier), impact factor 8.633
- International Journal of Production Research (Elsevier), impact factor 8.43
- International Journal of Production Economics (Elsevier), impact factor 8.31
- Automation in Construction (Elsevier), impact factor 7.700
- Computers in Industry (Elsevier), impact factor 7.635
- Journal of Business Research (Elsevier) impact factor 7.550
- Journal of Manufacturing Technology Management (Emerald), impact factor 7.547
- Sustainable Materials and Technologies (Elsevier), impact factor 7.053
- Technovation (Elsevier), impact factor 6.606
- Journal of Intelligent Manufacturing (Springer), impact factor 6.378
- International Journal of Contemporary Hospitality Management (Emerald), impact factor 5.667
- Manufacturing Letters (Elsevier), impact factor 5.533
- Robotics and Computer-Integrated Manufacturing (Elsevier), impact factor 5.666
- Computers & Industrial Engineering (Elsevier), impact factor 5.431
- Journal of Building Engineering (Elsevier), impact factor 5.318
- European Management Journal (Elsevier), impact factor 5.075
- Sustainable Production and Consumption (Elsevier), impact factor 5.032
- Environmental Impact Assessment Review (Elsevier), impact factor 4.549
- Engineering Science and Technology, an International Journal (Elsevier), impact factor 4.360
- Technology in Society (Elsevier), impact factor 4.192
- CIRP Journal of Manufacturing Science and Technology (Elsevier), impact factor 3.602
- International Journal of Advanced Manufacturing Technology, impact factor 3.320
- Sustainability (MDPI), impact factor 3.251
- IEEE Transactions on Engineering Management (IEEE), impact factor 2.81
- Applied Sciences (MDPI), impact factor 2.679
- International Journal of Industrial Ergonomics (Elsevier), impact factor 2.656
- International Journal of Agile Systems and Management (Inderscience), impact factor 2.50
- International Journal of Sustainable Engineering (Taylor & Francis), impact factor 2.298

- International Journal of Health Care Quality Assurance (Emerald), impact factor 2.038
- AI for Engineering Design, Analysis, Manufacturing (Cambridge Univ. Press), impact factor 1.671
- Systems Engineering (Wiley), impact factor 1.449
- Reviewer for many international Conferences (CIRP, IEEE, ICAD,…).

**Reviewer activity for funding agencies**

- **European Commission** in the evaluation of grant applications in the call TWIN-TRANSITION (Green and Digital).
- **National Research Council (NRC) Canada** for validation of research projects regarding Smart Factories and Cyber-Physical Production Systems.
- **Dutch Research Council (NWO)** for validation of research projects regarding Industry 4.0 and Smart Manufacturing.
- **Australian Research Council (ARC)** for validation of research projects regarding Industry 4.0 and Smart Manufacturing.
- **National Research and Development Agency Chile** for validation of research projects regarding Digitalization in Manufacturing.
- **Portuguese Foundation for Science and Technology (FCT)** in the exploratory projects call of the Massachusetts Institute of Technology (MIT) Portugal program; for validation of research projects in the field of Digital Transformation in Manufacturing.
- **KU Leuven (University of Leuven, Belgium)** for validation of research projects regarding sustainable and human-centred manufacturing.
- **University of Antwerp** (Netherlands) for validation of internal research projects for infrastructure grants
- **Technical University of Graz (Austria)** for validation of study curricula regarding sustainable and smart manufacturing.
- **Italian digital register of independent scientific experts** for the scientific evaluation of Italian research.
- **Finpiemonte** (Italy) for validation of research projects regarding Industry 4.0 (FESR 2014-2020)
- **Regione Marche** (Italy) for validation of research projects regarding Sustainable Production (FESR 2014-2020).

**Organization of workshops and conferences**

<u>Local conferences and events:</u>

- Nominated Chair for the **18th International Conference for Axiomatic Design (ICAD 2027)**, date tbd, to be held in Bruneck, Italy.
- Chair of the **16th International Conference for Learning Factories (CLF 2026)**, May 5-7, 2026 hold in Bolzano, Italy.
- Co-Chair of the **4th International Symposium on Industrial Engineering and Automation (ISIEA 2025) combined with the 18th European Professors for Industrial Engineering and Management (EPIEM) Conference**, June 18-20, 2025, hold in Bolzano, Italy
- Co-Chair of the **1st International Symposium on Industrial Engineering and Automation (ISIEA 2022)**, June 21-22, 2022 including a Special Session on Innovative Higher Education for Industry 4.0.
- Co-Chair of the **Bilateral Workshop on Smart and Sustainable Engineering Technologies**, November 11, 2021. Organized by the Free University of Bolzano and the Chiang Mai University in Bolzano.

- Co-Chair of the **Bilateral Workshop on Design of Smart Manufacturing Systems**, September 30, 2021. Organized by the Free University of Bolzano and Purdue University Fort Wayne, IN (online Workshop).
- Member of the **Organizing Committee of TFC21, The 21st ETRIA World Conference TRIZ FUTURE 2021**, Bolzano, Italy, September 22-24, 2021 (https://tfc21.events.unibz.it/).
- Co-Chair and lecturer at the **Summer School „Design of Complex Systems and AI in Design"** hosted by Free University of Bolzano with guest lecturers from Massachusetts Institute of Technologies (MIT) and Worcester Polytechnic Institute (WPI), July 13-15, 2021.
- Co-Chair and speaker at the **Online workshop "Introduction of Industry 4.0 in SMEs: Tools and potentials** for local SMEs within the project SME 4.0.
- Member of the Organizing Committee and lecturer at the **EUCLIDES International Week Industry 4.0: Technologies and Management**, 8-12 March, 2021, online, at Free University of Bolzano (https://industry40week.events.unibz.it/).
- Chair and organization of the international **"Workshop on Safety and Ergonomics for Collaborative Workspaces"**, January 31 2020 at the Free University of Bolzano
- Chair and speaker at **Project-Meeting of the Interreg Italia-Austria research project "Engineering Education 4.0"**, Bolzano (Italy), October 3rd 2019.
- Chair and lecturer at the **1st International Online Summer School on Axiomatic Design** hosted by Free University of Bolzano and Worcester Polytechnic Institute (WPI), USA, July 23-25 2019.
- Co-Chair and speaker at **2nd Stakeholder Workshop of the Interreg Italia-Austria research project "Engineering Education 4.0"**, Bolzano (Italy), May 29 2019.
- Co-Chair and speaker at **1st Stakeholder Workshop of the Interreg Italia-Austria research project "Engineering Education 4.0"**, Bolzano (Italy), February 22 2019.
- Co-Chair and speaker at **Kick-Off Event of the research project "ASSIST4WORK - Social sustainability in production through age-appropriate and disability-friendly workplace design using assistance systems"**, Bolzano (Italy), February 21 2019.
- Organizing committee of the **yearly meeting of Wissenschaftliche Gesellschaft für Arbeits- und Betriebsorganisation (WGAB) 2018** hosted at Bolzano, Italy, September 14-15 2018.
- Organizing committee of the **yearly annual meeting of Associazione Italiana Tecnologie Manifatturiere (AITEM) 2018** hosted at Bolzano, Italy, September 9-11 2018.
- Organizing committee and speaker at the **Summer School on Axiomatic Design** hosted at Bolzano, Italy, July 17-19 2018.
- Organizing committee and speaker at the **International Workshop "Eye tracking and biometric systems: breaking into industrial engineering"**, December 7 2017 at the Free University of Bolzano, Italy.
- Co-Chair and speaker at **Workshop with local SMEs in the EU project SME 4.0** to identify requirements of small and medium sized enterprises, Bolzano (Italy), June 9 2017.
- Co-Chair and speaker at the **"1st Annual Meeting SME 4.0 – Industry 4.0 for SMEs"**, February 8-9 2017 at the Free University of Bolzano,

Italy.

International conferences and events:

- Organization Committee of the **17th International Conference for Axiomatic Design (ICAD 2026)**, June 24-26, 2026, hold in Cambridge-Boston. USA.
- Member of the Program Committee of the **Manufacturing 2026 conference**, May 19-21, 2026, hold in Poznan, Poland.
- **Program Chair and Jury member of 7th Experiment International Conference EXPAT 2025**, 3-5 September, 2025, hold in Horta, Azores, Portugal.
- Member of the International Program Committee of the **6th International Conference on Innovative Intelligent Industrial Production and Logistics (IN4PL)**, 23-24 October, 2025 in Marbella, Spain.
- Program Committee Member of the **2025 International Conference on Smart Technologies & Education (STE 2025)**, 9-12 April, 2025 organized by EDUNET World Association.
- Program Committee Member of the **8th International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (DSMIE-2025)**, held in Porto, Portugal, on June 17–20, 2025.
- Member of the International Program Committee of the **5th International Conference on Innovative Intelligent Industrial Production and Logistics (IN4PL)**, 21-22 November, 2024 in Porto, Portugal.
- Member of the Programm Committee of the **IFAC 18th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2024)**, 28-30 August 2024, in Vienna, Austria.
- Member of the Programm Committee of the **19th International Scientific Conference on Industrial Systems (IS 2023)**, 5-6 October, 2023, in Novi Sad, Serbia.
- Co-Chair of the **International EDUNET World Conference (IEWC 2023)**, 1-3 March, 2023 organized by EDUNET World Association.
- Member of the International Program Committee of the **4th International Conference on Innovative Intelligent Industrial Production and Logistics (IN4PL)**, 15-17 November, 2023 in Rome, Italy.
- Member of the International Scientific Committee of the **International Conference on Innovation and Transformation in the Digital Age**, 28-30 November, 2022 organized by University College London, UK.
- Member of the International Program Committee of the **3rd International Conference on Industry 4.0 and Smart Manufacturing (ISM)**, 17-19 November, 2022 in Linz, Austria.
- Member of the International Program Committee of the **3rd International Conference on Innovative Intelligent Industrial Production and Logistics (IN4PL)**, 24-26 October, 2022 in Valletta, Malta.
- Member of the Scientific Committee of **15th European Professors of Industrial Engineering and Management (EPIEM) Conference 2022**, June 1-4, 2022 in Graz, Austria.
- Member of the Scientific Committee of **3rd International (virtual) Conference on Quality, Innovation and Sustainability – ICQIS2022**, May 3-4, 2022 in Aveiro, Portugal.

- Member of the International Program Committee of the **2nd International Conference on Innovative Intelligent Industrial Production and Logistics (IN4PL)**, 25-27 October, 2021 in Valletta, Malta.
- Member of the International Scientific Committee of the **7th Collaborative European Research Conference (CERC 2021)**, 9-10 September, 2021 in Cork, Ireland.
- Program Committee at **InterPartner 2021 International Conference on Advanced Manufacturing Processes**, September 7-10, 2021 in Odessa, Ukraine.
- Member of the Scientific Committee at **4th European Conference on Industrial Engineering and Operations Management (IEOM 2021)**, Rome, Italy August 2-5, 2021.
- Member of the **Organizing Committee** and **International Scientific Committee of "14th International Conference on Axiomatic Design (ICAD 2021)**, Lisbon, Portugal June 23-25, 2021.
- Member of the program committee at the **4th International Conference on Design, Simulation, Manufacturing: The Innovation Exchange**, June 8-11 2021, Lviv, Ukraine.
- Member of the Scientific Committee of **14th European Professors of Industrial Engineering and Management (EPIEM) Conference 2021**, 28 May, 2021 in Graz, Austria.
- Member of the **Expert Group of the World Manufacturing Report 2020** regarding "AI in Manufacturing", presented at the World Manufacturing Forum (WMF), Cernobbio, Lake Como, Italy, November 11-12, 2020.
- Session Coordinator and speaker in the Session "Transfer of Industry 4.0 from research to practice" at **ESOF EuroScience Open Forum 2020** in Trieste (www.esof.eu/en), September 2-6, 2020, Trieste, Italy.
- Program Committee at **"InterPartner 2020 International Conference on Advanced Manufacturing Processes"**, September 8-11, 2020 in Odessa, Ukraine.
- Member of the **International Scientific Committee at "Collaborative European Research Conference (CERC 2020)"**, Belfast, Northern-Ireland September 10-12, 2020.
- Member of the program committee and key note speaker at the "**3rd International Conference on Design, Simulation, Manufacturing: The Innovation Exchange**", June 9-12 2020, Kharkiv, Ukraine.
- Co-Chair and speaker at the **"4th Annual Meeting "SME 4.0 – Industry 4.0 for SMEs"**, February 19-20 2020 at Technical University of Kosice, Slovakia.
- Program Committee at **"InterPartner 2019 International Conference on Advanced Manufacturing Processes"**, September 10-13, 2019, Odessa, Ukraine.
- Program committee at the **"2nd International Conference on Design, Simulation, Manufacturing: The Innovation Exchange"**, June 11-14 2019, Lutsk, Ukraine.
- Co-Chair and speaker at the **"3rd Annual Meeting SME 4.0 – Industry 4.0 for SMEs"**, January 30-31 2019 at Chiang Mai University, Thailand.
- Member of **European Academic Committee at "2nd European IEOM Conference Industrial Engineering and Operations Management"**, Paris, France, July 26-27 2018.
- Co-Chair and speaker at the **"2nd Annual Meeting SME 4.0 –**

**Industry 4.0 for SMEs"**, May 24-25 2018 at Montanuniversität Leoben, Austria.

- **Organization of 3 workshops at industrial companies in New England USA** within the research project "SME 4.0 - Industry 4.0 for SMEs" in November 2017. Industry partners: IG Marston in Holbrook, MA 02343; Bel Air Finishing Supply Corporation in North Kingstown, RI 02852 and Donahue Industries Inc. in Shrewsbury, MA 01545.
- Co-Chair and speaker at **Workshop with local SMEs in the EU project SME 4.0** to identify requirements of small and medium sized enterprises, Worcester, MA (USA), September 28 2017.
- **Session Chair** of numerous international conferences.

**Technology transfer**

**Head of the two technology transfer labs on Digital and Green Manufacturing, namely the:**

**"Smart Mini Factory - laboratory for Industry 4.0" in Bolzano** (since 2016) with a budget of over 1,5 mio. Euro (capacity building funding of the Autonomous Province of Bolzano) with the aim to create a technology transfer lab for SMEs in the area of smart manufacturing, digital twin, automation and artificial intelligence in production. Leadership of 14 researchers, PhD students, project assistants and lab technicians

**"Sustainable Manufacturing Lab" in Brunico** (since 2023) with a budget of ~350k Euro (mix of unibz grants and external third party funding) to create a technology transfer lab for the sustainable transition of local SME companies. Leadership of 15 postdoc researchers, PhD students, project assistants and lab technicians

Both laboratories follow three missions:

- **Mission 1 (RESEARCH):** Conduct internationally competitive applied research on Smart and Sustainable Manufacturing (Industry 4.0 and 5.0).
- **Mission 2 (TEACHING):** Increase qualification regarding digital skills and green skills in South Tyrol. The two labs offer training courses on Industry 4.0 and sustainability topics for professionals from companies as well as for students and teachers from technical High Schools.
- **Mission 3 (INDUSTRY):** Collaboration with local industry and craftsmanship (commissioned research, sponsorship of phd students or participation in third party funding research programmes).

**Third mission**

- **Delegate of Third Mission for the Faculty of Engineering** at the Free University of Bolzano coordinating the Third Mission Board: introduced new formats for interaction between students, scholars, companies and schools (e.g. Industry Talk, Company Tours,…)
- **Organization of trainings and webinars on Industry 4.0 and sustainability topics for professionals from industry** in the Smart Mini Factory lab and the Sustainable Manufacturing Lab (>200 participants).
- **Organization of trainings and webinars on Industry 4.0 and sustainability topics for High School students and teachers** in the Smart Mini Factory lab and the Sustainable Manufacturing Lab (18 schools and >200 participants).
- **Coordination of the Digital Technology Summer Camp 2021 and 2022**: summer camp of 2 week training for high school students in collaboration with Bitz Fablab.
- **Yearly workshop at the Smart Mini Factory and Sustainable Manufacturing Lab** by a group of high school students, initiative

"Rendevouz mit dem Traumberuf".

- **Member of the Jury for the Digital Talent Competition** for high schools within the Interreg project Engineering Education 4.0 – coordination of the competition in South Tyrol. March 2021.
- **Member of the Jury for the Talent Competition** for high schools and students within the ERDF project INMOTION organized by Automotive Excellence South Tyrol.
- Yearly 2 x 4 hours of **lecture in "Tools and methods in Industrial Engineering"** for 5th classes at Technical Highschool Max Valier (~90 participants each year); during Covid as online format
- Collaboration with **associations and stakeholder groups** (Chamber of Commerce Bolzano, lvh, Innovalley, AES etc.).
- **Expert for interviews** on sustainability research and automotive for press media (Salto, ff) and TV (RAI Campus).
- 2019: **Radio lecturer for UNI Radio** on RAI Südtirol (three radio-lectures on Industry 4.0 in 2019). Link: http://www.raibz.rai.it/feed.php?id=83.
- **Lecturer in the diploma course "Praxislehrgang Digitale Transformation"** of the craftsmanship association lvh-apa with the module "Digital Production"
- **Lecturer in the diploma course "Lehrgang Innovation und Digitalisierung"** of the Chamber of Commerce of Bolzano with the module "Change Management"
- **TV-broadcast of collaboration with industry in "Sendereihe CAMPUS", Rai Sender Bozen**, December 6, 2018 (https://www.youtube.com/watch?v=LF4tNWEJ2uc)
- **Lecturer in the diploma course "Lehrgang Innovationsverantwortliche"** of the Chamber of Commerce of Bolzano with the module "Innovationen strukturiert planen"
- **White Papers with industry:** World Manufacturing Forum 2021 in collaboration with prestigious large international companies and innovative start-ups. White Paper 1 (undersigned in the lead): AI as an Enabler for Long-Term Resilience in Manufacturing (https://worldmanufacturing.org/wp-content/uploads/06_Rauch-1.pdf); White Paper 2 (undersigned as member of the editorial team): The Evolving Role of Competence Centres for Long Term Resilience in Manufacturing (https://worldmanufacturing.org/wp-content/uploads/04_Erdem-1.pdf). White Paper with the local company Solunio srl from Bruneck: Der Wandel vom traditionellen Lean ShopFloor Management zum Digitalen Shopfloor Management in Echtzeit. White Paper, 2019. Electronically published: https://www.produktion.de/whitepaper/digitales-shopfloor-management-in-echtzeit.html.
- **Industry 4.0 seminars and lab visit for high schools in South Tyrol** (~20-40 visits per year)
- Opening and tours/demonstrations in the Smart Mini Factory and Sustainable Manufacturing Lab during **Open Days and Science Live**
- **Coordination of "matura projects"** of the Technical High School in Bolzano and Brunico
- **Speaker and Workshop Leader** "Collaborative Robotics and Workplaces" - Digital Talent Day 2019, Chamber of Commerce of Bolzano, December 9 2019.
- **Presentations of the engineering study courses** at local High

Schools in Bozen, Schlanders, Meran, Brixen and Bruneck.

- **Coordination of the third mission project "Uni meets School" since 2010** – a project with High Schools of the Province of Bolzano, giving students the opportunity to gain 2 credit points in an optional course at the Free University of Bolzano.
- **Initiation and coordination of a Newsletter Series on Sustainability and Digitalization in cooperation with the Chamber of Commerce**, 8 newsletters with theoretical background on emerging technologies: https://www.handelskammer.bz.it/it/servizi/digitalizzazione/conoscenze-pratiche/articoli-specializzati .
- **Initiation and coordination of a Newsletter Series on Best Practices on Sustainability and Industry 4.0**, see best practices of Durst Group, Finstral, Progress 3D Innovation, alpitronic, Solunio and Mader. https://www.handelskammer.bz.it/de/dienstleistungen/digitalisierung/praxiswissen/best-practice.

**Institutional activities**

- **Since 2023 Delegate of the Dean for Third Mission** of the Faculty and coordination of the Third Mission Board
- **Member of the RIS3 working group "Automation/ Automotive",** appointment by the Autonomous Province of Bolzano.
- **Second member** of the study course council for the Master in Industrial Mechanical Engineering (LM-33) from the start of the program in 2016/17 until 2023.
- **Coordination of issues related to the Double Degree program** with Otto von Guericke University of Magdeburg (Germany) within LM-33.
- **Member of the Working group for establishing a Double Degree program** with Technical University Graz (Austria) in the Master LM33.
- **Member of the working group for the European Digital Innovation Hub** call – Work Package "Smart Manufacturing" for initiatives in "Test before Invest", Sept 2021 - Dec 2021
- **Member of the Working Group for the submission of an Erasmus Mundus Design Measure** for the development of an Erasmus Mundus Master on Digital and Sustainable Manufacturing (PI Prof. Renato Vidoni) together with other 3-5 European universities and a lump sum budget of 55.000 Euro (June 2021).
- **Member of the Working Group for the submission of an European Alliance proposal** which has been finally funded to create the SUNRISE alliance.
- Member of the PhD program **ASE (Advanced Systems Engineering)** a.y. 2019-20 – today.
- Member of the PhD program **SET (Sustainable Energy and Technologies)** a.y. 2018-19.
- **Responsible for Safety** in the Smart Mini Factory lab.
- **Member of the Delegation of South Tyrol** to strengthen research collaboration with the Technical University of Graz (16-18. November 2021).
- **Representation of unibz at Bernstein Conference 2021**, 23 September 2021, https://www.stol.it/artikel/chronik/valentin-braitenberg-award-fuer-eve-marder.
- Member in numerous **commissions for recruitment** of research and

teaching staff.

- Member of the **commission for selection of candidates** in the course LM-33 Master in Industrial Mechanical Engineering.
- Member of the **commission for selection of candidates** in the the AES PhD program.
- Member of the **AQ (Quality Assurance) commission** in the LM-33 Master in Industrial Mechanical Engineering.
- **Reference lecturer** in the MIUR database for the Master in Industrial Mechanical Engineering (LM-33).
- **Tutor** in the L-9 Bachelor in Industrial and Mechanical Engineering.
- **Tutor** in the LM-33 Master in Industrial Mechanical Engineering.
- **Presentation of the study programme** LM30 (Master in Energy Engineering) and LM-33 Master in Industrial Mechanical Engineering at Open Day and other events.
- **Presentation on Industry 4.0 and lab visit** for yearly English Intensive classes of the Language Centre of unibz.

**Further trainings**

- Regular **occupational safety trainings** for lab responsible
- **"ERC Training course"** on how to write a successful ERC proposal – Enspire-Science Consulting, 20.06.2018.
- Training course on **"E-Learning and video-lecturing"** – internal training course at Free University of Bolzano-Bozen, 25.09.2019.

**Language competence**

German: mother tongue
Italian: C1 - bilingualism certificate of the Province of Bolzano, A-level
English: C1 – Cambridge CAE

*I declare, pursuant to art. 76 of Presidential Decree 445/2000, that the information is true.*
*I authorize the processing of my personal data in accordance with Legislative Decree 30 June 2003, n. 196 "Code for the protection of personal data" and the GDPR 679/16 - "European Regulation on the protection of personal data".*

Bolzano February 02, 2026

# Publication list - ERWIN RAUCH

**Bibliometric data**

Total documents in Scopus = **222**

Number of citations in Scopus = **5.500**

H-index in Scopus = **41**

**Summary of publications** (published and accepted)**:**

| | |
|---|---|
| Journal articles | 69 |
| Books | 6 |
| Book chapters | 20 |
| Conference papers | 175 |
| White Papers / Reports | 4 |
| National and Trade magazines | 25 |
| **TOTAL** | **299** |

**Journal articles (69)**

1. CANO, A. K. S., ALI, M. B., **RAUCH, E.**, & MATT, D. T.: Environmental Performance Measurement in the Precast Concrete Sector Using a Fuzzy Logic-Based Stakeholder-Driven Indicator Selection. Results in Engineering, 2025, 106667. DOI: 10.1016/j.rineng.2025.106667. Scopus indexed (Quartile 1, impact factor 7.9).

2. ZARE, L., ALI, M. B., **RAUCH, E.**, & MATT, D. T.: Navigating Challenges of Small and Medium-Sized Enterprises in the Era of Industry 5.0, Results in Engineering, 2025, 106457. DOI: 10.1016/j.rineng.2025.106667. Scopus indexed (Quartile 1, impact factor 7.9).

3. NEZZI, C., DE MARCHI, M., VIDONI, R., & **RAUCH, E.**: A Multi-Purpose Simulation Layer for Digital Twin Applications in Mechatronic Systems. Machines, 2025, 13(8), 671. DOI: 10.3390/machines13080671. Scopus indexed (Quartile 2, impact factor 2.5).

4. FELDER, M., DE MARCHI, M., DALLASEGA, P., & **RAUCH, E.**: Smart Routing for Sustainable Supply Chain Networks: An AI and Knowledge Graph Driven Approach. Applied Sciences, 2025, 15(14), 8001. DOI: 10.3390/app15148001. Scopus indexed (Quartile 2, impact factor 2.5).

5. NEZZI, C., GUFLER, V., VIDONI, R., & **RAUCH, E.**: Kinematic and dynamic modeling of mechanical systems towards Digital Twins. Results in Engineering, 2025, 104874. Scopus indexed (Quartile 1, impact factor 7.9).

6. JAKOBS, L., HOFER, A., & **RAUCH, E.**: A framework and taxonomy for categorizing industrial symbiosis in manufacturing. Journal of Engineering Sciences (Ukraine), 2025, 12(1), B1–B10. DOI: 10.21272/jes.2025.12(1).b1. Scopus indexed (Quartile 2, impact factor 2.26).

7. KITTICHOTSATSAWAT, Y., **RAUCH, E.,** & TIPPAYAWONG, K. Y.: Designing sustainability measurement of a Thai coffee supply chain using axiomatic design and business model canvas. Results in Engineering, 2024, 24, 103443. DOI: 10.1016/j.rineng.2024.103443. Scopus indexed (Quartile 1, impact factor 7.9).

8. BATALEBLU, A. A., **RAUCH, E.**, & COCHRAN, D. S.: Resilient Sustainability Assessment Framework from a Transdisciplinary System-of-Systems Perspective. Sustainability, 2024, 16(21), 9400. DOI: 10.3390/su16219400. Scopus indexed (Quartile 2, impact factor 3.3).

9. BEN ALI, M., & **RAUCH, E.**: Sustainable Mobility Transition: A SWOT-AHP Analysis of the Case Study of Italy. Sustainability, 2024, 16(11), 4861. DOI: 10.3390/su16114861. Scopus indexed (Quartile 2, impact factor 3.3).

10. ARUVÄLI, T., DE MARCHI, M., & **RAUCH, E.**: Analysis of quantitative metrics for assessing resilience of human-centered CPPS workstations. Scientific Reports, 2023, 13(1), 2914. DOI: 10.1038/s41598-023-29735-1, Scopus indexed (Quartile 1, impact factor 4.3).

11. DE MARCHI, M., FRIEDRICH, F., RIEDL, M., ZADEK, H., & **RAUCH, E.**: Development of a resilience assessment model for manufacturing enterprises. Sustainability, 2023, 15(24), 16947. DOI: 10.3390/su152416947. Scopus indexed (Quartile 2, impact factor 3.3).

12. KITTICHOTSATSAWAT, Y., BOONPRASOPE, A., **RAUCH, E.**, TIPPAYAWONG, N., & TIPPAYAWONG, K. Y.: Forecasting arabica coffee yields by auto-regressive integrated moving average and machine learning approaches. AIMS Agriculture & Food, 2023, 8(4), 1052-1070. DOI: 10.3934/agrfood.2023057. Scopus indexed (Quartile 2, impact factor 1.3).

13. GUALTIERI, L.; **RAUCH, E.**; VIDONI, R.: Human-Robot Activity Allocation Algorithm for the Redesign of Manual Assembly Systems into Human-Robot Collaborative Assembly. International Journal of Computer Integrated Manufacturing, 2023, 36(2), 308-333. DOI: 10.1080/0951192X.2022.2083687. Scopus indexed (Quartile 1, impact factor 9.7).

14. Kittichotsatsawat, Y., **Rauch, E.**, Woschank, M., & Tippayawong, K. Y.: Development of product supply chain strategy using BMC and axiomatic design. Journal of Engineering Sciences (Ukraine), 2023, 10(2), A43-A58. DOI: 10.21272/jes.2023.10(2).a6. Scopus indexed (Quartile 2, impact factor 2.26).

15. GUALTIERI, L.; FRABONI, F.; DE MARCHI, M.; **RAUCH, E.**: Development and evaluation of design guidelines for cognitive ergonomics in human-robot collaborative assembly systems. Applied Ergonomics, 2022, 104, 103807. DOI: 10.1016/j.apergo.2022.103807. Scopus indexed (Quartile 1, impact factor 4.30).

16. MARK, B. G., **RAUCH, E.**, MATT, D. T.: Systematic selection methodology for worker assistance systems in manufacturing. Computers & Industrial Engineering, 2022, 166, 107982. DOI: 10.1016/j.cie.2022.107982. Scopus indexed (Quartile 1, impact factor 5.431).

17. GUALTIERI, L.; **RAUCH, E.**; VIDONI, R.: Development and validation of guidelines for safety in human-robot collaborative assembly systems. Computers and Industrial Engineering, 2021, 163, 107801. DOI: 10.1016/j.cie.2021.107801. **Scopus indexed** (Quartile 1, impact factor 5.431).

18. MARK, B.G.; **RAUCH, E.**; MATT, D.T.: Worker assistance systems in manufacturing: A review of the state of the art and future directions. Journal of Manufacturing Systems, 2021, 59, pp. 228-250. DOI: 10.1016/j.jmsy.2021.02.017. **Scopus indexed** (Quartile 1, impact factor 8.633).

19. MATT, D. T.; **RAUCH, E.**: Biological Transformation in Manufacturing: Overview and Fields of Application. IEEE Engineering Management Review, 2021, 49(4), pp. 115-122. DOI: 10.1109/EMR.2021.3126748. **Scopus indexed** (Quartile 3, impact factor 1.590).

20. FRANCALANZA, E.; BORG, J.; **RAUCH, E.**; PUTNIK, G. D.; ALVES, C.; LUNDGREN, M.; AMZA, C.: Specifications for a Digital Training Toolbox for Industry 4.0. FME Transactions, 2021, 49(4), 886-893. DOI: 10.5937/fme2104893F. **Scopus indexed** (Quartile 2, impact factor 1.77).

21. BORG, J.; FRANCALANZA, E.; **RAUCH, E.**; PUTNIK, G.; AMZA, C.; LUNDGREN, M.; ALVES, C.; ZAMMIT, M.S.; VELLA, P.: An Industry 4.0 Training Framework Addressing 'COVID-19 Type' Disruptions on Manufacturing. Digital Manufacturing Technology, 2021, 1(1), pp. 60-80. DOI: 10.37256/dmt.112021921.

22. GUALTIERI, L.; **RAUCH, E.**; VIDONI, R.: Emerging Research Fields in Safety and Ergonomics in Industrial Collaborative Robotics: a Systematic Literature Review. Robotics and Computer-Integrated Manufacturing, 2021, 67, 101998. DOI: 10.1016/j.rcim.2020.101998. **Scopus indexed** (Quartile 1, impact factor 5.666, **listed as one of the most downloaded articles in the last 90 days**.

23. GUALTIERI, L.; **RAUCH, E.**; VIDONI, R.: Methodology for the definition of the optimal assembly cycle and calculation of the optimized assembly cycle time in human-robot collaborative assembly. International Journal of Advanced Manufacturing Technology, 2021, 113(7-8), pp. 2369-2384. DOI: 10.1007/s00170-021-06653-y. **Scopus indexed** (Quartile 1, impact factor 3.320).

24. PALOMBA, I.; GUALTIERI, L.; ROJAS, R.; **RAUCH, E.**; VIDONI, R.; GHEDIN, A.: Mechatronic re-design of a manual assembly workstation into a collaborative one for wire harness assemblies. Robotics, 2021, 10(1), 43. DOI: 10.3390/robotics10010043. **Scopus indexed** (Quartile 2, impact factor 2.940).

25. EMER, A.; UNTERHOFER, M.; **RAUCH, E.**: A Cybersecurity Assessment Model for Small and Medium-Sized Enterprises. IEEE Engineering Management Review, 2021, 49(2), 9424999. DOI: 10.1109/EMR.2021.3078077. **Scopus indexed** (Quartile 3, impact factor 1.590). Contribution: conceptualization, methodology, supervision, writing-reviewing-editing.

26. BROZZI, R.; **RAUCH, E.**; RIEDL, M.; MATT, D.T.: Industry 4.0 roadmap for SMEs: validation of moderation techniques for creativity workshops. International Journal of Agile Systems and Management, 2021, 14(2), pp. 276-291. DOI: 10.1504/IJASM.2021.118064. **Scopus indexed** (Quartile 1, impact factor 2.500).

27. ROJAS, R.; **RAUCH, E.**; MATT, D.T.: Research Fields and Challenges to implement Cyber-Physical Production Systems in SMEs: A Literature Review. Chiang Mai University Journal of Natural Sciences, 2021, 20(2), e2021022. DOI: 10.12982/CMUJNS.2021.022. **Scopus indexed** (Quartile 3, impact factor 0.492).

28. **RAUCH, E.**; UNTERHOFER, M.; NAKKIEW, W.; BAISUKHAN, A.; MATT, D.T.: Potential of the Application of Additive Manufacturing Technology in European SMEs. Chiang Mai University Journal of Natural Sciences, 2021, 20(2), e2021023. DOI: 10.12982/CMUJNS.2021.023. **Scopus indexed** (Quartile 3, impact factor 0.492).

29. **RAUCH, E.**; VICKERY, A.R.: Systematic Analysis of Needs and Requirements for the Design of Smart Manufacturing Systems in SMEs. Journal of Computational Design and Engineering, 2020, 7(2), pp. 129-144. DOI: 10.1093/jcde/qwaa012. **Scopus indexed** (Quartile 1, impact factor 5.860).

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**Conference Papers (175)**

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2. EMER, A., SANDFORTH, G., NEZZI, C., **RAUCH, E.**, MATT, D.: An Axiomatic Design Approach to Data Collection Modeling for Sustainability Reporting in Manufacturing. International Conference on Responsible Consumption and Production (EURECA-PRO 2025). Accepted paper.

3. JAKOBS, L., MARK, B., **RAUCH, E.,** MATT, D.: Mapping Industry 4.0 Technologies to Key Functions in Industrial Symbiosis. International Conference on Responsible Consumption and Production (EURECA-PRO 2025). Accepted paper.

4. BEN ALI, M., FASIL, R.M., RAUCH, E.: Female University Makerspaces: Conceptual Design for Sustainable and Tech-Integrated Learning. 7th Experiment@ International Conference (EXPAT 2025). Accepted paper in press.

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Bolzano February 02, 2026