ISM

4ᵗʰ International Conference on Industry 4.0 and Smart Manufacturing

ISM 2022

Program

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ISM 2022

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ISM 2022
A new blended format

The ISM 2022 conference will be held in a blended way, meaning that all the plenary and parallel sessions and conference events will be streamed online on Microsoft Teams^{TM}, where online participants will not only be able to watch and listen to the talks but also interact with the participants on site and give their talk. This program (in the PDF format) as well as the Program-at-a-Glance include the links to the online rooms. Click on "> Join the online room" from your PC to enter the sessions.

Participation as online observer is free!

If you are attending remotely, you can find some useful information on how to connect at: https://www.msc-les.org/ism2022/venue/#participation.

ISM 2022
COVID-19 Prevention & Control Guidelines

What to know before travelling to Austria
- No Pre-Travel-Clearance is required when entering Austria but we highly recommend to keep yourself updated with the latest news and regulations regarding entry requirements into Austria as they could change from the moment this program has been published. You can find updates at https://entry.ptc.gv.at/en.html.
- Please DO NOT attend the event if you are positive or notice an acute respiratory infection (with or without fever) with symptoms such as cough, sore throat, shortness of breath, upper respiratory catarrh, sudden loss of sense of smell or taste, or if you have been in contact with persons with COVID-19 symptoms.

At the event
- People that are tested positively on Covid-19 (and also those with a traffic restriction) are not allowed to enter the facilities of FH Upper Austria.
- Wearing a mask is not mandatory but highly recommended, especially in crowded areas or while commuting with the bus shuttle.
- All participation rooms will be adequately ventilated and each room will operate with a reduced capacity. The maximum number of attendants will be indicated and available seats will be a priori indicated. Hand sanitizers will be provided in the rooms.
- Monitor your health daily and be alert for symptoms. Conference in-presence attendees should uphold a responsible behavior also outside the conference venue and inform the organizing team of any possible risk.

Time zone: Central European Time (CET; UTC+01:00)

Nov 2nd, 08:00 – 09:00

Round up & Shuttle Bus Transfer Linz > Hagenberg
only for in-person participants

Nov 2nd, 09:00 – 10:00
Conference Registration Desk @Foyer 2.0

Attendees' Welcome & Reception

Nov 2nd, 10:00 – 10:45
Room Audimax

Opening Ceremony & Welcome Messages
> Join the online room

Opens and introduces: Francesco Longo, ISM 2022 General Co-Chair, University of Calabria, Italy

> Welcome Messages

Markus Achleitner	Ministry of Economy, Science & Research, Upper Austria
Gerald Reisinger	University President, University of Applied Sciences Upper Austria
Michael Affenzeller	Provost, University of Applied Sciences Upper Austria and ISM 2022 General Co-Chair
Berthold Kerschbaumer	Dean, Faculty for Informatics, Communications and Media, University of Applied Sciences Upper Austria, Austria
Bruno Buchberger	Founder of the Softwarepark Hagenberg, Austria
Stephan Winkler	Scientific head, Softwarepark Hagenberg, Austria
Agostino Bruzzone	ISM 2022 Mentor Chair, University of Genoa, Italy
Weiming Shen	ISM 2022 Program Co-Chair, Huazhong University of Science and Technology, China
Antonio Padovano	ISM 2022 Program Co-Chair, University of Calabria, Italy

Nov 2nd, 10:45 – 11:15

Networking Coffee Break

ISM Plenary Talks

Chair: Francesco Longo, ISM 2022 General Co-Chair, University of Calabria, Italy

> Industrial Innovation Post Digitalisation

Alois FERSCHA
Johannes Kepler University, Austria

Envisioning a foreseeable "post digitalisation" era in industrial innovation, we identify massive potential in the miniaturization and autonomisation of seamlessly embedded AI technologies towards a ground breaking, rigorous and ubiquitous "cognification" of industrial systems. Current trends include the deployment of AI technology in industry, involving centralized, edge and cloud-based back-end AI, with very complex algorithmic machine learning strategies, massive computational effort for model training and inference and intricate generation and handling of huge data sets. Our research, in contrast, aims for a radically miniaturized, radically dispersed, federated, resource- efficient, low power, low algorithmic complexity, live, online, human brain inspired, real-time AI that operates on- device, and reliably even in harsh environments. We attempt for autonomic ondevice AI, and its amplification to collective on-multiple-device AI. Thus we address (i) the miniaturization of AI systems (hardware, algorithms, methods), (ii) the orchestration of dispersed AIs, (iii) the opportunistic self-organization of limited resource ensemble AIs, (iv) reinforcement-, federated- and transfer-learning models and methods to operate embedded AIs, as well as (iv) the mapping of all the related findings into the cognification of products and production systems of the future.

Biographical Sketch
Alois Ferscha studied Computer Science at the Technical University of Vienna (TU Wien) and the University of Vienna (Uni Wien), and was with the Department of Applied Computer Science at the University of Vienna at the levels of assistant and associate professor (1986-1999). In 2000 he joined the Johannes Kepler University Linz as full professor where he founded and heads the Institute of Pervasive Computing. He is the scientific head of the Research Studio PCA (Pervasive Computing Applications), and president of the Austrian Scientific Society for Production ÖWGP. In 2015 he proposed the COMET K1 Centre Pro 2 Future (Products and Production Systems of the Future), which was granted and founded in 2017, and which he heads as CSO. He has successfully proposed, scientifically guided, actively researched, lead and completed more than 25 national (FFG, IKTdZ, PdZ) and international (EU FP6, FP7) projects in the domains Pervasive/Ubiquitous/Wearable/Cognitive Computing, Cognitive Products, Wireless Sensor/Actuator Systems, Multimodal HCI and High Performance Simulation. He was guest professor/researcher at international universities (UoGenova, UoOregon, UoMaryland, UoTurin), authored more than 300 peer reviewed scientific publications and is active as editor and reviewer for renowned scientific journals. He is a research agenda consultant at national (BMK, BMDW BMLV) and EC (DG CONNECT) level and has served as member of numerous committees of well-known conferences (PERVASIVE, UbiComp, ISWC, WWW, PerDis, INTETAIN, PADS, DS-RT, SIGMETRICS, MASCOTS, MSWiM, MobiWac, TOOLS, Euro-Par, PNPM, ICS, etc.), Co-chaired e.g. PERVASIVE 2004, ISWC 2009, IOT 2017, and TCPchaired e.g. IEEE DS-RT, PERVASIVE, DOA SVI, MASCOTS, PADS. Currently he is GC-cochair of EWSN 2022. His work has received several awards (e.g. Heinz Zemanek Award, Innovation Award, Multimedia Staatspreis, Ö-WGP Zukunftspreis).

> The Resilient Operator 5.0: Human Operators' Resilience and Human-Machine Systems' Resilience in Industry 5.0

David ROMERO
Tecnológico de Monterrey, Mexico

This keynote introduces "The Resilient Operator 5.0" concept in the quest of designing and developing better human and human-machine systems that combine the unique capabilities of humans and machines towards smarter and more resilient manufacturing systems. It aims to reflect on the system-resilience of a manufacturing system as a whole as well as of its human-machine (work cell) systems, which are as good as the resilience of its weakest sub-system, which in many cases may be the human system due to its inherent human fragility. Hence, when engineering smart resilient manufacturing systems with an Industry 5.0 vision, a human-centric perspective should be taken into account to address human operators' resilience as individual agents as well as cooperative agents within the existing human-machine systems of a manufacturing system.

Biographical Sketch

Prof. Dr. David Romero is a Professor of Advanced Manufacturing at the Departments of Industrial Engineering and Mechatronics of the Tecnológico de Monterrey University in Mexico, and a National Academia Representative and Coach for the Regional Secretariat of Intelligent Manufacturing Systems (IMS) - Mexico. His research interests include: Circular Manufacturing, Service Engineering and Product-Service Systems, Cyber-Physical Systems & Human Systems, Advanced Production Management Systems, Green Virtual Enterprises, and Technology and Engineering Management in the context of the Fourth Industrial Revolution. He is a member of the Society of Collaborative Networks, the IFAC TC5.3 on Enterprise Integration and Networking, the IFIP WG5.7 on Advances in Production Management Systems, the IFIP WG5.12 on Architectures for Enterprise Integration, the IEEE Technology and Engineering Management Society, and the IEEE Internet of Things Community. Furthermore, he is an Agenda Contributor at the World Economic Forum (WEF) Council on "Shaping the Future of Advanced Manufacturing and Production", and a World Manufacturing Forum (WMF) Ambassador. He has published more than 150 journal and international conference articles. He serves on different editorial and scientific committees and advisory boards in academia, industry, and government in the disciplines of business and industrial engineering. Nowadays, he is focused on promoting the concepts of the "Operator 4.0/5.0" and "Digital Lean Manufacturing"; the father of both terms.

Nov 2nd, 13:00 – 14:30
University Restaurant

Networking Lunch

Nov 2nd, 14:30 – 16:10
Room Audimax   **S1.1 - DYNPLAN**

Integrated and dynamic planning for efficient smart manufacturing: Recent advances in management and science

> Join the online room

Chair: Andreas Beham – *University of Applied Sciences Upper Austria, Austria*

14:30 - 14:50	Solving large scale industrial production scheduling problems with complex constraints: an overview of the state-of-the-art (#8959) *Manuel Schlenkrich and Sophie Parragh*
14:50 - 15:10	Simulation-based Optimization of Material Requirements Planning Parameters (#9541) *Bernhard Werth, Johannes Karder, Andreas Beham and Klaus Altendorfer*
15:10 - 15:30	A Novel Benchmark Environment for Dynamic Factory Crane Scheduling (#215) *Johannes Karder, Bernhard Werth, Andreas Beham, Stefan Wagner and Michael Affenzeller*

| 15:30 - 15:50 | Modeling the Energy Flexible Job Shop with a Disaggregated Load Approach for Changeable Manufacturing (#7591) |
| | *Dominik Leherbauer and Peter Hehenberger* |

| 15:50 - 16:10 | An improved method of job shop scheduling using machine learning and mathematical optimization (#4481) |
| | *Eiji Morinaga, Xuetian Tang, Koji Iwamura and Naoki Hirabayashi* |

Nov 2nd, 14:30 – 16:10

Room HS3   **S2.1 - CLOUD**

The adoption of cloud computing technologies for enabling Industry 4.0 visions

> Join the online room

Chair: Abdulrahman Nahhas – *Otto von Guericke University Magdeburg, Germany*

| 14:30 - 14:50 | An Edge-Cloud based Reference Architecture to support cognitive solutions in Process Industry (#534) |
| | *Antonio Salis, Angelo Marguglio, Gabriele De Luca, Silvia Razzetti, Walter Quadrini and Sergio Gusmeroli* |

| 14:50 - 15:10 | Enterprise IT Architecture Greenfield Design Combining IEC 62264 and TOGAF by Example of Battery Manufacturing (#2688) |
| | *Michael Oberle, Ozan Yesilruth, Andreas Schlereth, Monika Risling and Daniel Schel* |

| 15:10 - 15:30 | Architecture for managing AAS-based business processes (#3327) |
| | *William Ochoa, Felix Larrinaga and Alain Perez* |

| 15:30 - 15:50 | Towards a B2B integration framework for smart services in Industry 4.0 (#4970) |
| | *Viktor Schubert, Steffen Kuehner, Tobias Krauss, Martin Trat and Janek Bender* |

| 15:50 - 16:10 | Asset Administration Shell as an interoperable enabler of Industry 4.0 software architectures: a case study (#6341) |
| | *Walter Quadrini, Chiara Cimino, Tasnim A. Abdel-Aty, Luca Fumagalli and Diego Rovere* |

Nov 2nd, 14:30 – 16:10

Room HS4   **S3.1 - HUMAN**

Human factors and human-machine interaction in 4.0 production environments

> Join the online room

Chair: Andrea Revolti – *University of Bozen-Bolzano, Italy*

| 14:30 - 14:50 | Industry 4.0 vs. Industry 5.0: Co-existence, Transition, or a Hybrid (#6907) |
| | *Mariia Golovianko, Vagan Terziyan, Vladyslav Branytskyi and Diana Malyk* |

| 14:50 - 15:10 | Lessons Learned from Human Pose Interaction in an Industrial Spatial Augmented Reality Application (#2686) |
| | *Gernot Stuebl, Christoph Heindl, Gerhard Ebenhofer, Harald Bauer and Andreas Pichler* |

| 15:10 - 15:30 | A Petri Net Architecture for Real-Time Human Activity Recognition in Work Systems (#3470) |
| | *Jan-Phillip Herrmann, Alexander Atanasyan, Felix Casser and Sven Tackenberg* |

15:30 - 15:50	A model to evaluate the Human Error Probability in inspection tasks of a production system (#5400)
	Salvatore Digiesi, Francesco Facchini, Giorgio Mossa and Micaela Vitti

15:50 - 16:10	A human-centered conceptual model for integrating Augmented Reality and Dynamic Digital Models to reduce occupational risks in industrial contexts (#6016)
	Luca Gualtieri, Andrea Revolti and Patrick Dallasega

Nov 2nd, 14:30 – 16:10

Room HS5   **S4.1- ZERODFCT**

Emerging technologies and paradigms for achieving Zero Defect Manufacturing
> Join the online room

Chair: Foivos Psarommatis – *University of Oslo, Norway*

14:30 - 14:50	A practical guide for implementing Zero Defect Manufacturing in new or existing manufacturing systems (#1790)
	Foivos Psarommatis and Gökan May

14:50 - 15:10	Lessons from adopting robotic in-line quality inspection in the Swedish manufacturing industry (#8126)
	Victor Azamfirei, Anna Granlund and Yvonne Lagrosen

15:10 - 15:30	An approach towards Zero Defect Manufacturing by combining IIoT data with Industrial Social Networking (#6352)
	Kosmas Alexopoulos, Thodoris Tsoukaladelis, Chrysa Dimitrakopoulou, Nikolaos Nikolakis and Amit Eytan

15:30 - 15:50	A YOLO-based Real-time Packaging Defect Detection System (#7218)
	Thi Thu Huyen Vu, Dinh-Lam Pham and Taiwoo Chang

15:50 - 16:10	Automating dairy production lines with the yoghurt cups recognition and detection process in the Industry 4.0 era (#3043)
	Fotios Konstantinidis, Vasiliki Balaska, Symeon Symeonidis, Dimitrios Tsilis, Spyridon Mouroutsos, Loukas Bampis, Athanasios Psomoulis and Antonios Gasteratos

Nov 2nd, 14:30 – 16:10

Room HS6   **S5.1 - EVOLVE**

Evolution perspectives and I4.0 developments for SMEs
> Join the online room

Chair: Manuel Woschank – *Montanuniversitaet Leoben, Austria*

14:30 - 14:50	Lessons-learnt on articulating and evaluating I4.0 developments at SME manufacturing companies (#1454)
	Jenny Coenen, Rufus Fraanje, Mirjam Zijderveld and Sander Limonard

14:50 - 15:10	Technological Transformation Model for SMEs (#2311)
	Alicia Mon and Horacio Del Giorgio

15:10 - 15:30	The opportunities and challenges of digitalization for SMEs (#3430)
	Arnesh Telukdarie, Thabile Dube, Pretty Matjuta and Simon Philbin

15:30 - 15:50   Industry 4.0 concepts within the sub–Saharan African SME manufacturing sector (#9348)
Peter Onu, Anup Pradhan and Charles Mbohwa

Nov 2nd, 16:10 – 16:40

Networking Coffee Break

Nov 2nd, 16:40 – 18:20

Room Audimax   **S1.2 - ANALYT**

Data analytics for anomaly detection, maintenance and reliability

> Join the online room

Chair: Stefan Wagner – *University of Applied Sciences Upper Austria, Austria*

16:40 - 17:00   Intelligent Concrete Surface Cracks Detection using Computer Vision, Pattern Recognition, and Artificial Neural Networks (#8258)
Majid Mirbod and Maryam Shoar

17:00 - 17:20   Manufacturing Reliability and Cost Improvements through Data Analytics: An Industry Case Study (#4823)
Rob Geary and John Cosgrove

17:20 - 17:40   A Review Study on ML-based Methods for Defect-Pattern Recognition in Wafer Maps (#8335)
Theodosios Theodosiou, Theodoros Tziolas, Aikaterini Rapti, Konstantinos Papageorgiou, Elpiniki Papageorgiou, Nikolaos Dimitriou, George Margietis and Dimitrios Tzovaras

17:40 - 18:00   Predictive maintenance on injection molds by generalized fault trees and anomaly detection (#9010)
Pedro Nunes, Eugénio Rocha, José Santos and Ricardo Antunes

18:00 - 18:20   Effective reliability verification of a technical subsystem through prior information generated by component tests (#9794)
Nikolaus Haselgruber

Nov 2nd, 16:40 – 18:20

Room HS3   **S2.2 - ROBOT**

Design and Management of Cobot Systems for Smart Manufacturing

> Join the online room

Chair: Irene Granata – *University of Padova, Italy*

16:40 - 17:00   Energy expenditure and makespan multi-objective optimization for cobots systems design (#7946)
Irene Granata, Maurizio Faccio and Martina Calzavara

17:00 - 17:20   The Importance of Cobot Speed and Acceleration on the Manufacturing System Efficiency (#3602)
Robert Ojstersek, Borut Buchmeister and Aljaz Javernik

17:20 - 17:40   Industrial Robot Training in the Simulation Using the Machine Learning Agent (#9702)
Karle Nutonen, Vladimir Kuts and Tauno Otto

17:40 - 18:00   Human-Robot Co-working Improvement via Revolutionary Automation and Robotic Technologies – An overview (#9709)
Omolayo Ikumapayi, Sunday A. Afolalu, Temitayo S. Ogedengbe, Rasaq A. Kazeem and Esther T. Akinlabi

18:00 - 18:20   A Safety 4.0 Approach for Collaborative Robotics in the Factories of the Future (#7799)
Luca Caruana and Emmanuel Francalanza

Nov 2nd, 16:40 – 18:20

Room HS4   **S3.2 - EDU4.0**

Education and training challenges for Industry 4.0 professionals

Chair: Monica Ciolacu – *University of Passau, Germany*

16:40 - 17:00   Student-Centered Learning Tool for Cognitive Enhancement in the Learning Environment (#3871)
Damilola Ayomide Dada and Opeyeolu Timothy Laseinde

17:00 - 17:20   On the development of the Digital Shadow of the Fischertechnik Training Factory Industry 4.0: an educational perspective (#6104)
Roberto Sala, Fabiana Pirola and Giuditta Pezzotta

17:20 - 17:40   Creation of the university curriculum in the field of Industry 4.0 with the use of modern teaching instruments - Polish case study (#6626)
Manuela Ingaldi, Robert Ulewicz and Dorota Klimecka-Tatar

17:40 - 18:00   What does Industry 4.0 mean to Industrial Engineering Education? (#2052)
Bertha Leticia Treviño-Elizondo and Heriberto García-Reyes

18:00 - 18:20   Leader skills interpreted in the lens of education 4.0 (#8393)
Selma Oliveira and Marcela Saraiva

Nov 2nd, 16:40 – 18:20

Room HS5   **S4.2 - INTEGRA**

Architectures and data Integration for industrial platforms

Chair: Andrey Kharitonov – *Otto-von-Guericke-University Magdeburg, Germany*

16:40 - 17:00   Fleet management systems in Logistics 4.0 era: a real time distributed and scalable architectural proposal (#746)
Ricardo Dintén, Sebastián García and Marta Zorrilla

17:00 - 17:20   The Potential of Low-Power, Cost-Effective Single Board Computers for Manufacturing Scheduling (#3989)
Pedro Coelho, Catarina Bessa, Cristovao Silva and Jorge Landeck

17:20 - 17:40   Description Model of Smart Connected Devices in Smart Manufacturing Systems (#298)
Juergen Lenz, Dominik Lucke and Thorsten Wuest

17:40 - 18:00	Lessons learnt in industrial data platform integration (#5567)
	Sylvain Lacroix, Emeric Ostermeyer, Julien Le Duigou, Florent Bornard, Sylvain Rival, Marie-France Mary and Benoît Eynard
18:00 - 18:20	On the Integration of Google Cloud and SAP HANA for Adaptive Supply Chain in Retailing (#275)
	Abdulrahman Nahhas, Christian Haertel, Christian Daase, Matthias Volk, Achim Ramesohl, Heiko Steigerwald, Alexander Zeier and Klaus Turowski

Nov 2nd, 16:40 – 18:20
Room HS6   **S5.2 - DESIGN**

Industry 4.0-inspired design and development approaches
> Join the online room

Chair: Romina Conte – *University of Calabria, Italy*

16:40 - 17:00	Effective factors for estimating market share in concept testing (#1959)
	Takumi Kato, Susumu Kamei, Takumi Ootsubo and Yosuke Ichiki
17:00 - 17:20	Mathematical pattern for parametric design: the case study of Grey-Scott cross diffusion model (#7057)
	Francesca Bertacchini, Roberto Beneduci, Eleonora Bilotta, Francesco Demarco, Pietro Pantano and Carmelo Scuro
17:20 - 17:40	A predictive eco-design method and tool for electric vehicles of Industry 4.0 (#5696)
	Luca Manuguerra, Federica Cappelletti, Francesca Manes and Michele Germani
17:40 - 18:00	Development of a novel integrated hopper briquette machine for sustainable production of pellet fuels (#7938)
	M. O. Okwu, O. D. Samuel, O. B. Otanocha, E. E. Akporhonor and L.K. Tartibu
18:00 - 18:20	Active Transfer Prototypical Network: An Efficient Labeling Algorithm for Time-Series Data (#5110)
	Yuqicheng Zhu, Mohamed Ali Tnani, Timo Jahnz and Klaus Deipold

Nov 2nd, 18:45 – 19:30
Round up & Shuttle Bus Transfer Hagenberg > Linz
only for in-person participants

Nov 2nd, 19:30 – 22:00
Social Event @Ars Electronica Center, Linz
Details are available in the next pages.

Time zone: Central European Time (CET; UTC+01:00)

Nov 3rd, 08:00 – 09:00
Round up & Shuttle Bus Transfer Linz > Hagenberg
only for in-person participants

Nov 3rd, 09:10 - 10:50
Room HS1   **S1.1 - BIOMFG**
Biomanufacturing 4.0
> Join the online room

Co-Chairs: Paola Serena Ginestra – *University of Brescia, Italy*; Antonio Piccininni – *Polytechnic University of Bari, Italy*

09:10 - 09:30	Evaluation of the compressive properties of different lattice geometries to be used as temporary implants (#8954) *Pedro Nogueira, Kerman Castresana, João Margrinho, M. Beatriz Silva, Augusto Moita de Deus and M. Fátima Vaz*
09:30 - 09:50	Conceptual Thoughts on Biointelligent Embedded Systems and Operating Systems Architecture (#242) *Arber Shoshi, Robert Miehe and Thomas Bauernhansl*
09:50 - 10:10	A Mixed Reality application to support the design of custom prostheses (#6681) *Michele Gattullo, Antonio Piccininni, Alessandro Evangelista, Pasquale Guglielmi, Antonio Boccaccio, Angela Cusanno, Antonio Emmanuele Uva and Gianfranco Palumbo*
10:10 - 10:30	Development of an integrated information system for the manufacturing of Titanium hybrid fully-custom prostheses (#8630) *Antonio Piccininni, Pasquale Guglielmi, Luigi Manna, Angela Cusanno, Antonio Palmacci and Gianfranco Palumbo*
10:30 - 10:50	Thermal behaviour of resin inserts for micro injection moulding: a FEM analysis (#9835) *Benedetta Stampone, Maurizio Ravelli, Luca Giorleo and Gianluca Trotta*

Nov 3rd, 09:10 - 10:50

Room HS3   **S2.1 - DECISION**

Decision science and knowledge management in the 4th industrial revolution
> Join the online room

Chair: Kaifeng Yang – *University of Applied Sciences Upper Austria, Austria*

09:10 - 09:30   Gathering Expert Knowledge in Process Industry (#6743)
Sabrina Luftensteiner, Georgios C. Chasparis and Michael Mayr

09:30 - 09:50   Sustainable supplier selection in oil and gas operations: An integrated approach for Multi-Criteria Decision Analysis (#247)
Joachim Gidiagba, Lagouge Tartibu and Modestus Okwu

09:50 - 10:10   ANFIS Model for Cost Analysis in a Dual Source Multi-Destination System (#2148)
Modestus Okwu, Lagouge Tartibu, Ebenezer Ojo, Sidum Adumene, Joachim Gidiagba and Johnson Fadeyi

10:10 - 10:30   A new composite indicator for Manufacturing efficiency (#5592)
Gerarda Fattoruso, Salvatore Ammirato, Alberto Michele Felicetti and Antonio Violi

10:30 - 10:50   Integrated production and maintenance planning in hybrid manufacturing-remanufacturing system with outsourcing opportunities (#5536)
Merghem Mohammed, Haoues Mohammed, Mouss Kinza Nadia, Dahane Mohammed and Senoussi Ahmed

Nov 3rd, 09:10 - 10:50

Room HS4   **S3.1 - COVID**

How the Industry 4.0 helped to face the COVID-19 pandemic
> Join the online room

Chair: Marta Rinaldi - *University of Campania "Luigi Vanvitelli", Italy*

09:10 - 09:30   Exploring the Role of Industry 4.0 and Simulation as a Solution to the COVID-19 Outbreak: A Literature Review (#5273)
Giovanni Mirabelli, Letizia Nicoletti, Antonio Padovano, Vittorio Solina, Karen Althea Manfredi and Antonio Nervoso

09:30 - 09:50   The Potential of Advanced Technologies that Assist with COVID-19 to Improve the Healthcare Performance (#7610)
Omar Ali, Ahmad Alahmad and Hasan Kahtan

09:50 - 10:10   Improving the Distribution of Covid-19 vaccines using the blockchain technology: the Italian case study (#8700)
Marta Rinaldi, Maria Antonietta Turino, Marcello Fera and Roberto Macchiaroli

10:10 - 10:30   Perspectives on Effectiveness of Food Safety Management Systems During Pandemic (#2725)
Thomas Maiberger and Funlade Sunmola

10:30 - 10:50   Industry 4.0 and Covid-19: evidence from a case study (#6977)
Barbara Bigliardi, Eleonora Bottani, Giorgia Casella, Serena Filippelli, Alberto Petroni, Benedetta Pini and Emilio Gianatti

Computer vision systems for Industry 4.0 applications
> Join the online room

Chair: Fotios Konstantinidis – *Institute of Communication and Computer Systems, Greece*

09:10 - 09:30	Multi-sensor cyber-physical sorting system (CPSS) based on Industry 4.0 principles: A multi-functional approach (#9338) *Fotios Konstantinidis, Savvas Sifnaios, Georgios Tsimiklis, Spyridon Mouroutsos, Angelos Amditis and Antonios Gasteratos*
09:30 - 09:50	IndustrialEdgeML - End-to-end edge-based computer vision system for Industry 5.0 (#6533) *Raphael Wagner, Mario Matuschek, Philipp Knaack, Michael Zwick and Manuela Geiß*
09:50 - 10:10	On Domain Randomization for Object Detection in real industrial scenarios using Synthetic Images (#7820) *Davide Pasanisi, Emanuele Rota, Michele Ermidoro and Luca Fasanotti*
10:10 - 10:30	Identification of the characteristics of helicoidally filament wound tubes using vision systems (#2692) *Antonios Stamopoulos, Antoniomaria Di Ilio, Giulio D'Emilia, Emanuela Natale and Luciano Chiominto*
10:30 - 10:50	Digital model reconstruction through 3D Stereo Depth camera: a faster method exploiting robot poses (#9124) *Ahmed Zaki, Marco Carnevale, Hermes Giberti and Christian Schlette*

Harmonic industry and transition paradigms for circular innovation
> Join the online room

Chair: Luigino Filice – *University of Calabria, Italy*

09:10 - 09:30	Industry 5.0: The Arising of a Concept (#2227) *Fotios Konstantinidis, Savvas Sifnaios, Georgios Tsimiklis, Spyridon Mouroutsos, Angelos Amditis and Antonios Gasteratos*
09:30 - 09:50	Supply chain management in case of producer disruption between external (instable) forces and effective models (#2455) *Mariacarmela Passarelli, Giuseppe Bongiorno, Patrizia Beraldi, Musmanno Roberto, Luigi Filice*
09:50 - 10:10	Artificial Intelligence as a disruption technology to build the Harmonic Health Industry (#4078) *Domenico Marino, Demetrio Naccari Carlizzi and Valeria Falcomatà*
10:10 - 10:30	The Paradox of Kazakhstan: Linear vs Harmonic Innovation (#9257) *Mariza Tsakalerou and Almat Abilez*
10:30 - 10:50	On the Harmonic Innovation Hub: how the transition should be accompanied toward a new paradigm (#6269) *Luigino Filice, Francesco Cicione and Luca Meldolesi*

Nov 3rd, 10:50 – 11:20
Networking Coffee Break

Nov 3rd, 11:20 - 13:00
Room HS1   **S1.2 - ADDMFG**
Additive manufacturing for industrial applications: advances and case studies
> Join the online room

Chair: Giuseppina Ambrogio – *University of Calabria, Italy*

11:20 - 11:40   A Porter's Five Forces Model Proposal for Additive Manufacturing Technology: A Case
                   Study in Portuguese industry (#9799)
                   Soraya Dias, Pedro Espadinha-Cruz and Florinda Matos

11:40 - 12:00   Material properties of AISI H10 (32CrMoV12-28) hot work tool steel processed by Laser
                   Powder Bed Fusion with 200 °C substrate preheating temperature (#9400)
                   Norbert Wild, Jochen Giedenbacher and Aziz Huskic

12:00 - 12:20   Additive Manufacturing for orthopedic applications: Case study on market impact
                   (#9897)
                   Paola Ginestra and Miriam Seiti

12:20 - 12:40   Job-scheduling model for an autonomous additive manufacturing: a case of 3D food
                   printing (#7957)
                   Mohammed Alghamdy, Faisal Almutairi and Rafiq Ahmad

12:40 - 13:00   Additive Manufacturing Service provider Selection Using a Neutrosophic Best Worst
                   Method (#4530)
                   Sagar Ghuge

Nov 3rd, 11:20 - 13:00
Room HS3   **S2.2 - IIOT**
Novel concepts and opportunities in the Industrial Internet of Things
> Join the online room

Chair: Alexandra Lagorio – *University of Bergamo, Italy*

11:20 - 11:40   5G in Logistics 4.0: potential applications and challenges (#3545)
                   Alexandra Lagorio, Chiara Cimini, Roberto Pinto and Sergio Cavalieri

11:40 - 12:00   Industrial internet of things (IIoT): opportunities, challenges, and requirements in
                   manufacturing businesses in emerging economies (#6449)
                   Peter Onu, Anup Pradhan and Charles Mbohwa

12:00 - 12:20   Ultra Wide Band communication for condition-based monitoring, a bridge between
                   edge and cloud computing (#1618)
                   *Andrea Bonci, Eduard Caizer, Maria Cristina Giannini, Federico Giuggioloni and Mario Rosario
                   Prist*

12:20 - 12:40   How Important are Digital Technologies for Urban Food Security? A Framework for
                   Supply Chain Integration using IoT (#2958)
                   Soujanya Mantravadi and Jagjit Singh Srai

12:40 - 13:00   Industry 4.0 Maturity and Readiness- A case of a Steel Manufacturing Organization
(#6464)
Pinosh Kumar Hajoary

Nov 3rd, 11:20 - 13:00
Room HS4   **S3.2 - MATERIAL**

Material and inventory management: new 4.0 perspectives and results
> Join the online room

Chair: Eleonora Bottani – *University of Parma, Italy*

11:20 - 11:40   Logistics 4.0 in intermodal freight transport (#5419)
Laszlo Vida, Béla Illés and Ágota Bányainé-Tóth

11:40 - 12:00   Evaluation of Indicators for Simulation's Prediction Quality of Material Demand in
Matrix Production Systems (#3393)
Daniel Ranke, Axel Bruns, Rouven Fink, Annika Lehnert and Thomas Bauernhansl

12:00 - 12:20   A new procedure for spare parts inventory management in ETO production: a case
study (#3900)
Marta Rinaldi, Marcello Fera, Roberto Macchiaroli and Eleonora Bottani

12:20 - 12:40   Order Management Perspective on Fluid Manufacturing Systems (#5992)
Theresa-Franziska Hinrichsen, Christian Fries, Manuel Hagg and Manuel Fechter

12:40 - 13:00   EOI or EOQ? A simulation study for the inventory management of a company operating
in the railway sector (#4248)
Letizia Tebaldi, Barbara Bigliardi, Serena Filippelli and Eleonora Bottani

Nov 3rd, 11:20 - 13:00
Room HS5   **S4.2 - XR**

Extended reality application for smart factories
> Join the online room

Chair: Antonio Padovano – University of Calabria, Italy

11:20 - 11:40   Mixed Reality or Simply Mobile? A Case Study on Enabling Less Skilled Workers to
Perform Routine Maintenance Tasks (#4762)
Meike Wagner, Christian Leubner and Jobin Strunk

11:40 - 12:00   Augmented Reality to support the maintenance of urban-line infrastructures: A case
study (#2671)
Andrea Revolti, Patrick Dallasega, Felix Schulze and Alexander Walder

12:00 - 12:20   Implementing Virtuality in Production - a Design Science Approach (#3176)
Manuel Brunner, Nadine Bachmann, Herbert Jodlbauer and Shailesh Tripathi

12:20 - 12:40   Advanced visualization of ergonomic assessment data through Industrial Augmented
Reality (#7544)

Alessandro Evangelista, Vito M. Manghisi, Sara Romano, Vito De Giglio, Lorenzo Cipriani and Antonio E. Uva

12:40 - 13:00   Physical and digital worlds: implications and opportunities of the metaverse (#8694)
Fabio De Felice, Cristina De Luca, Simona Di Chiara and Antonella Petrillo

Nov 3rd, 11:20 - 13:00
Room HS6   **S5.2 - ML**
Machine learning and data-driven method for smart manufacturing and maintenance
> Join the online room

Chair: Jan Zenisek – *University of Applied Sciences Upper Austria, Austria*

11:20 - 11:40   Using analytical and data-driven methods to develop a soft-sensor for flow rate monitoring in tube extrusion (#9219)
Enrico Bovo, Marco Sorgato and Giovanni Lucchetta

11:40 - 12:00   Identification of Surrogate Models for the Prediction of Degrees of Freedom within a Tolerance Chain (#3983)
Hannah Janout, Thomas Paier, Carina Ringelhahn, Michael Heckmann, Andreas Haghofer, Gabriel Kronberger and Stephan Winkler

12:00 - 12:20   An automated approach to reuse machining knowledge through 3D – CNN based classification of voxelized geometric features (#303)
Eram Asghar, Andrea Ratti and Tullio Tolio

12:20 - 12:40   A predictive approach for enhancing outcomes performance in SAW process (#4394)
Romina Conte, Gabriele Zangara, David Izquierdo Rodríguez, Serafino Caruso and Giuseppina Ambrogio

12:40 - 13:00   Advancing Maintenance Strategies Through Digitalization - a Case Study (#4491)
Oliver Fuglsang Grooss

Nov 3rd, 13:00 – 14:30
University Restaurant
Networking Lunch

Nov 3rd, 14:30 - 16:10
Room HS1   **S1.3 - ADDMFG**
New additive manufacturing methods and processes
> Join the online room

Co-Chairs: Paola Serena Ginestra – *University of Brescia, Italy*; Antonio Piccininni – *Polytechnic University of Bari, Italy*

14:30 - 14:50   Lasers in the manufacturing of cardiovascular metallic stents: Subtractive and additive processes with a digital tool (#6094)
Ali Gökhan Demir and Barbara Previtali

14:50 - 15:10   Linking Thermal Images with 3D Models for FFF Printing (#8213)

Leon Binder, Simon Rackl, Michael Scholz and Mathias Hartmann

15:10 - 15:30	Method of Process Improvement for LMD-Processes using Machine Learning Alorithms (#1685) *Holger Groening and Jan Zenisek*

15:30 - 15:50	Modelling of Wire Arc Additive Manufactured Product Cost (#5785) *Samruddha Kokare, João P. Oliveira and Radu Godina*

15:50 - 16:10	Effects of milling parameters on roughness and burr formation in 3D- printed PLA components (#9368) *Mohamad El Mehtedi, Pasquale Buonadonna, Mauro Carta, Rayane El Mohtadi, Gianluca Marongiu, Gabriela Loi and Francesco Aymerich*

Nov 3rd, 14:30 - 16:10

Room HS3   **S2.3 - BCHAIN**

Applications of blockchain technology in industrial and supply chain contexts

> Join the online room

Chair: Ferdinando Chiacchio – University of Catania, Italy

14:30 - 14:50	The key challenges of blockchain implementation in maritime sector: summary from literature and previous research findings (#9367) *Ali Gökhan Demir and Barbara Previtali*

14:50 - 15:10	A Prototype of Supply Chain Traceability using Solana as blockchain and IoT (#5363) *Mateen Ashraf and Cathal Heavey*

15:10 - 15:30	Transparency by Design for Blockchain-Based Supply Chains (#3509) *Patrick Burgess and Funlade Sunmola*

15:30 - 15:50	Cases of application of blockchain on the supply chain: a literature review (#1060) *Giorgia Casella, Barbara Bigliardi, Serena Filippelli and Eleonora Bottani*

15:50 - 16:10	Systematic mapping study on the security and efficiency of blockchain in industrial context (#7780) *Eric Brandt, Felix Brandt, Philipp Seiler and Dirk Reichelt*

Nov 3rd, 14:30 - 16:10

Room HS4   **S3.3 - GREEN**

Circular economy and sustainability in a 4th industrial context

> Join the online room

Chair: Stefano Saetta – *University of Perugia, Italy*

14:30 - 14:50	Analysis of sustainable concrete obtained from the by-products of an industrial process and recycled aggregates from construction and demolition waste (#8861) *Marco Bergonzoni, Riccardo Melloni and Lucia Botti*

14:50 - 15:10	Information support the process of managing energy-saving technological changes in enterprises (#4142)

Olexandr Yemelyanov, Ihor Petrushka, Olena Zahoretska, Kateryna Petrushka and Anatolii Havryliak

15:10 - 15:30   Implementation Model for Digital Retrofit for Sustainable Production (#5452)
Markus Kröll and Christian Cseh

15:30 - 15:50   Applicability and Limitations of Change Management for Circular Economy in Manufacturing Companies (#6469)
Niclas-Alexander Mauss, Dominik Bühner and Johannes Fottner

15:50 - 16:10   The Green Foundry Lean and Green Simulation Model (#7920)
Stefano Saetta and Valentina Caldarelli

Nov 3rd, 14:30 - 16:10
Room HS5   **S4.3 - TIME**

Time-series and time-dependent data analysis in Industry 4.0
> Join the online room

Chair: Michael Affenzeller – *University of Applied Sciences Upper Austria, Austria*

14:30 - 14:50   Utilizing an adaptive window rolling median methodology for time series anomaly detection (#5131)
Dimitris Dimoudis, Thanasis Vafeiadis, Alexandros Nizamis, Dimosthenis Ioannidis and Dimitrios Tzovaras

14:50 - 15:10   Solving Agricultural Price Recommendation Problem Using Smart Reading Algorithms (#2157)
Fajar Delli Wihartiko, Sri Nurdiati, Agus Buono and Edi Santosa

15:10 - 15:30   Training and Tuning of Neuro - Fuzzy Control Laws for the Machining of Prosthetics (#3724)
Mangolika Bhattacharya, Pat O'Neil, Mark Southern and Martin Hayes

15:30 - 15:50   Exploring the time-lagged causality of process variables from injection molding machines (#9344)
Shailesh Tripathi, Christian Mittermayr and Herbert Jodlbauer

Nov 3rd, 14:30 - 16:10
Room HS6   **S5.3 - INNO**

Innovation models and entrepreneurship frameworks
> Join the online room

Chair: Luigino Filice – *University of Calabria, Italy*

14:30 - 14:50   How entrepreneurial is German Generation Z vs. Generation Y? (#2185)
Christian Dreyer and Hana Stojanová

14:50 - 15:10   Development of a digital innovation framework that is renowned Globally (#7342)
Sameh Saad and Samah Alnuaimi

15:10 - 15:30   Successful digital transformations enabled by technologies or by open mind? Italian case studies (#4831)

Ludovica Oliveri, Ferdinando Chiacchio, Diego D'Urso, Alessia Munnia and Francesco Russo

15:30 - 15:50 Impact analysis of Industry 4.0 in SMEs. Harmonic innovation as a virtuous evolution for the community development (#2190)
Gabriele Zangara, Antonio Maria Igor Cosma and Luigino Filice

15:50 - 16:10 The adoption of Open Innovation in Manufacturing: a review (#1053)
Barbara Bigliardi, Virginia Dolci, Serena Filippelli, Alberto Petroni, Benedetta Pini and Leonardo Tagliente

Nov 3rd, 16:10 – 16:40
Networking Coffee Break

Nov 3rd, 16:40 - 18:20
Room Audimax

ISM Plenary Talks & Awards Ceremony
> Join the online room

Chair: Antonio Padovano, ISM 2022 Program Co-Chair, University of Calabria, Italy

> Assembly line design: towards customized production environments

Olga BATTAIA
Kedge Business School, France

In production research, assembly line design is an intensively studied combinatorial optimization problem, which attracts high attention from both academia and practice. The aim of this presentation is to analyse actual problem formulations that are more and more frequently hybridized with other optimization problems in order to create efficient solutions for customized production environments adapted for volatile markets. This presentation of the state of the art is based on a survey of more than 500 articles published in refereed journals between 2012 and 2022.

Biographical Sketch

Prof. Olga Battaïa has a Full Professor position in Department of Operations Management and Information Systems at Kedge Business School. She obtained her PhD form the Ecole des Mines de Saint-Etienne in France in 2007, for which she was granted the Best PhD Thesis Award by the French Research Cluster on Modelling, Analysis and Management of Dynamic Systems. She serves as Associated Editor for several international peer-reviewed journals, including the Journal of Manufacturing Systems, IISE Transactions and Omega-the International Journal of Management Science. She is also a Member of IFAC Technical Committee 5.2. Manufacturing Modelling for Management and Control. Her research interests lie in the domains of Supply Chain Management, Sustainable manufacturing, Business Analytics, Decision Support Systems. Olga Battaïa co-authored more than 200 scientific publications and supervised or co-supervised 11 PhD students. During last 5 years, she coordinated and participated in such research projects as: "Design and management of sustainable and reconfigurable production systems" (ReconfiDurable) funded by the French National Research Agency, European project RISE MAIA – Models and Methods for an Active Ageing Workforce: an International Academy, "Design of spatio-temporal networks in stochastic and dynamic environment: new mathematical models and optimization approaches " (DESIDE) funded by the French National Research Agency, "Sustainable Personnel Planning in Highly Customized Assembly Lines with Work Sharing" (SUPERPLAN) funded by German Research Agency (DFG), "Planning and flexible work assignment to operators in aeronautic assembly lines: a systemic approach for addressing ergonomic and economic risks" (PER4MANCE), funded by the French National Research Agency, "Strategic Design of Reverse Supply Chains under uncertainty in Circular Economy Context" (CONSCIENCE) funded by French

Region Occitanie, "Optimisation of Maintenance Operations" (OPTIMA) funded by French Defense Agency and Dassault Aviation. She was invited to present her research at several renowned international conferences and universities in Europe, America, Asia and Africa.

> Perspectives on Industry 4.0/5.0 and Smart Manufacturing

Lihui WANG
KTH Royal Institute of Technology, Sweden

Industry 4.0 has become a globally adopted term in the past decade. Many countries have introduced similar strategic initiatives, and a considerable research effort has been spent on developing and implementing some of the Industry 4.0 technologies. At the ten-year mark of the introduction of Industry 4.0, the European Commission announced Industry 5.0 in January 2021. Industry 4.0 is considered to be technology-push, whereas Industry 5.0 is more value-driven. The co-existence of two Industrial Revolutions invites questions and demands discussions. On the other hand, smart manufacturing closely relates to both Industry 4.0 and 5.0. It depends on the timely acquisition, distribution, and utilisation of data/information from machines on manufacturing shop floors. For the sake of the audience with diverse background, the following topics will be covered in this talk: (1) current status and movements towards smart manufacturing, (2) latest advancement and future opportunities in smart manufacturing, and (3) showcases of relevant applications along the direction. Finally, challenges and future trends will be identified and highlighted.

Biographical Sketch

Lihui Wang is a Professor and Chair of Sustainable Manufacturing at KTH Royal Institute of Technology, Sweden. His research interests are presently focused on human-robot collaborations, brain robotics, cyber-physical production systems, real-time monitoring and control, predictive maintenance, and adaptive manufacturing systems. Professor Wang is actively engaged in various professional activities. He is the Editor-in-Chief of Robotics and Computer-Integrated Manufacturing, Journal of Manufacturing Systems, and International Journal of Manufacturing Research. He has published 10 books and authored in excess of 600 publications. Professor Wang is a Fellow of Canadian Academy of Engineering, CIRP, SME and ASME, as well as a Professional Engineer in Canada. He was the President (2020-2021) of North American Manufacturing Research Institution, and the Chairman (2018-2020) of Swedish Production Academy.

> Presentation of the ISM 2022 Awards
Co-Chairs: Francesco Longo, ISM 2022 General Co-Chair, University of Calabria, Italy; Michael Affenzeller, ISM 2022 General Co-Chair, University of Applied Sciences Upper Austria, Austria

- ➢ Best Paper Award
- ➢ Industrial Impact Award
- ➢ Best Service Innovation Paper Award
- ➢ Best Reviewer Awards

Nov 3rd, 18:45 – 19:30

Round up & Shuttle Bus Transfer Hagenberg > Linz
only for in-person participants

Nov 3rd, 19:30 – 22:30

Gala Dinner @Pöstlingberg Schlössl, Linz
Details are available in the next pages

Time zone: Central European Time (CET; UTC+01:00)

Nov 4th, 08:00 – 09:00

Round up & Shuttle Bus Transfer Linz > Hagenberg
only for in-person participants

Nov 4th, 09:10 - 10:50
Room Audimax   **S1.1 - ERGO**

Safety and ergonomics enabled by 4.0 technologies
> Join the online room

Chair: Valentina Di Pasquale – *University of Salerno, Italy*

09:10 - 09:30   Complexity based investigation in collaborative assembly scenarios via non intrusive techniques (#3821)
Sotirios Panagou, Monica Sileo, Konstantinos Papoutsakis, Fabio Fruggiero, Ammar Qammaz and Antonis Argyros

09:30 - 09:50   Minimizing occupational risk by automation of the special processes - based on occupational risk assessment (#5111)
Dorota Klimecka-Tatar, Robert Ulewicz and Manuela Ingaldi

09:50 - 10:10   Ergonomics Postural Risk Assessment and Observational Techniques in the 21st Century (#8573)
Temitayo S. Ogedengbe, Oluranti A. Abiola, Omolayo Ikumapayi, Sunday A. Afolalu, Adekunle I. Musa, Abiola O. Ajayeoba and Timothy A. Adeyi

10:10 - 10:30   A transformers-based approach on industrial disaster consequence identification from accident narratives (#5380)
Vasileios Linardos, Maria Drakaki and Panagiotis Tzionas

10:30 - 10:50   Work break scheduling using wrist wearable devices a conceptual and practical model (#5876)
Valentina Di Pasquale, Valentina De Simone, Martina Radano and Salvatore Miranda

Nov 4th, 09:10 - 10:50
Room HS3   **S2.1 - MAINT**

Prediction methods for advanced maintenance strategies in smart factories
> Join the online room

Chair: Weiming Shen, Huazhong University of Science and Technology, China

09:10 - 09:30   Self-Attention Transformer-Based Framework for Predicting Remaining Useful Life of Complex Machines (#6017)
Abdul Wahid, John G Breslin, Muhammad Ali Intizar and Muhammad Yahya

09:30 - 09:50   A method to estimate the remaining useful lifetime of a two-jaw parallel gripper based on experimental failure threshold data (#500)
Serkan Mert, Günter Bitsch and Johannes L. Jooste

09:50 - 10:10   Influence of the target data in the accurate prediction of the maintenance operation for a HPDC press machine (#8785)
Sebastiano Fanelli, Antonio Piccininni, Pasquale Guglielmi and Stefano Cafagna

10:10 - 10:30   A Remaining Useful Life Prediction Method for Lithium-ion Battery Based on Temporal Transformer Network (#2876)
Wenbin Song, Di Wu, Weiming Shen and Benoit Boulet

Nov 4th, 09:10 - 10:50

Room HS4   **S3.1 - AGRICULT**

Innovative solutions for smart and sustainable agri-food production and horticulture 4.0
> Join the online room

Chair: Vittorio Solina – *University of Calabria, Italy*

09:10 - 09:30   Comparison of Energy-use Efficiency for Lettuce Plantation under Nutrient Film Technique and Deep-Water Culture Hydroponic Systems (#7091)
Syed Abreez Gillani, Rabiya Abbasi, Pablo Martinez and Rafiq Ahmad

09:30 - 09:50   Simulation in the temperature parameters control in the yogurt manufacturing process (#1316)
Honorato Ccalli Pacco

09:50 - 10:10   The contribution of Horticulture 4.0 innovations to more sustainable horticulture (#6565)
Sabine Ludwig-Ohm, Phillip Hildner, Marike Isaak, Walter Dirksmeyer and Jan Schattenberg

10:10 - 10:30   Simulation Modeling Of Consumer Behavior Within The Concept Of Smart Consumption (#2666)
Lubov Krestyanpol

10:30 - 10:50   On the development and deployment of an IIoT Infrastructure for the Fish Canning Industry (#1546)
Sérgio Teixeira, Rafael Arrais, Rui Dias and Germano Veiga

Nov 4th, 09:10 - 10:50

Room HS5   **S4.1 - SIMUL**

Modeling & Simulation in the 4th industrial era: theory, applications and trends
> Join the online room

Chair: Johannes Karder – *University of Applied Sciences Upper Austria, Austria*

| 09:10 - 09:30 | Simulation models for public transportation: a state of the art review (#3141) |
| | *Carmen A. Garcia-Cerrud and Idalia Flores de la Mota* |

| 09:30 - 09:50 | Using Simulation Optimization to Improve the Performance of an Automated Manufacturing Line (#7828) |
| | *Patrick Ruane, Patrick Walsh and John Cosgrove* |

| 09:50 - 10:10 | Modelling for Cleaner Production & Optimization (#5458) |
| | *Lesego Mabitsela, Arnesh Telukdarie and Megashnee Munsamy* |

| 10:10 - 10:30 | Water systems modeling and optimization (#8857) |
| | *Megashnee Munsamy, Arnesh Telukdarie and Pretty Matjuta* |

| 10:30 - 10:50 | Simulation based optimization of drilling equipment logistics: a case of study (#8272) |
| | *Andrea Gómez Ramírez and Francisca Irene Soler Anguiano* |

Nov 4th, 09:10 - 10:50
Room HS6   **S5.1 - PROJECT**

Roundtable: R&D Project Dissemination Activities
> Join the online room

Chair: Antonio Padovano – *University of Calabria, Italy*

BLING - Blockchain in Government (Funding Programme: Interreg North Sea)
Sergey Tsiulin, Aalborg University, Denmark

Blended Learning Implementation for reSilient, acceSsible and efficient higher education (BLISS)
(Funding Programme: Erasmus+ - KA220-HED - Cooperation partnerships in higher education)
Roberto Sala, University of Bergamo, Italy

CREDIT (Comparative Research and Development on Industrialisation in Tanzania) (Funding Programme:
Erasmus+ - KA220-HED - Cooperation partnerships in higher education)
Christopher Awinia, Open University of Tanzania, Tanzania

Nov 4th, 10:50 – 11:20

Networking Coffee Break

Nov 4th, 11:20 - 13:00
Room Audimax   **S1.2 - FEDLEA**

Federated Learning for Industry 4.0 and Smart Manufacturing
> Join the online room

Co-Chairs: Ihsan Ullah – *University of Galway, Ireland;* Ali Intizar - *Dublin City University, Ireland*

| 11:20 - 11:40 | Federated Learning as a Privacy Solution - An Overview (#1986) |
| | *Mashal Khan, Frank G. Glavin and Matthias Nickles* |

11:40 - 12:00	Machine Learning and Computer Vision for the automation of processes in advanced logistics: the Integrated Logistic Platform (ILP) 4.0 (#3561)
	Michele Di Capua, Angelo Ciaramella and Aniello De Prisco

12:00 - 12:20	Crowd-sourced Federated Learning for Industry 4.0 (#7971)
	Ihsan Ullah, Umair Ul Hassan and Ali Intizar

12:20 - 12:40	Compression scenarios for Federated Learning in Smart Manufacturing (#859)
	Seif Allah El Mesloul Nasri, Michael Madden and Ihsan Ullah

12:40 - 13:00	An overview on the use of AI/ML in Manufacturing MSMEs: solved issues, limits, and challenges (#3287)
	Valentina De Simone, Valentina Di Pasquale and Salvatore Miranda

Nov 4th, 11:20 - 13:00
Room HS3   S2.2 - RESIL

Sustainable and resilient manufacturing

> Join the online room

Chair: Emmanuel Francalanza – *University of Malta, Malta*

11:20 - 11:40	Project and Risk Management in Smart Supply Chain: the case of infant formulas (#6844)
	Michelle Chevalier Hernadez, Adrielly Nahomee Ramos Alvarez and Francisca Irene Soler Anguiano

11:40 - 12:00	Resilience in value creation systems through additive manufacturing: a decision model (#206)
	Hajo Groneberg, Timo Bock and Frank Doepper

12:00 - 12:20	Quality in production planning: Definition, quantification and a machine learning based improvement method (#3907)
	Lukas Lingitz, Viola Gallina, Johannes Breitschopf, Luana Finamore and Wilfried Sihn

12:20 - 12:40	Importance of Machine learning for Digital resilient Supply chain (#7561)
	Sachin Yadav and Surya Prakash Singh

12:40 - 13:00	Agility as a force to emerge from the darkness to better days (#543)
	Brenda Silva and Selma Oliveira

Nov 4th, 11:20 - 13:00
Room HS4   S3.2 - FOODSC

Towards smart and sustainable agri-food supply chains

> Join the online room

Chair: Vittorio Solina – *University of Calabria, Italy*

11:20 - 11:40	Fresh food shelf-life improvement by humidity regulation in domestic refrigeration (#7113)
	Tuany Gabriela Hoffmann, Caroline Meinert, Felipe Ormelez, Marcelo Campani, Sávio Leandro Bertoli, Laércio Ender and Carolina Krebs de Souza

11:40 - 12:00	E-grocery supply chain innovation and financial inclusion: A framework (#1365)
	Marcia Mkansi and Godfrey Mugurusi

12:00 - 12:20	Actionable insights for horticulture supply chains through advanced IoT analytics (#8269)
	Owen Keates

12:20 - 12:40	Industry 4.0 in the agrifood supply chain: a review (#1803)
	Barbara Bigliardi, Eleonora Bottani, Giorgia Casella, Serena Filippelli, Alberto Petroni, Benedetta Pini and Emilio Gianatti

12:40 - 13:00	The Digital Supply Chain Twin paradigm for enhancing resilience and sustainability against COVID-like crises (#8058)
	Francesco Longo, Giovanni Mirabelli, Antonio Padovano and Vittorio Solina

Nov 4th, 11:20 - 13:00
Room HS5   **S4.2 - SECURITY**

Cybersecurity and information preservation in the 4th industrial era
> Join the online room

Chair: Pedro Espadinha da Cruz – *Universidade NOVA de Lisboa, Portugal*

11:20 - 11:40	Encryption and Generation of Images for Privacy-Preserving Machine Learning in Smart Manufacturing (#8012)
	Vagan Terziyan, Diana Malyk, Mariia Golovianko and Vladyslav Branytskyi

11:40 - 12:00	Digital Transformation, Applications, and Vulnerabilities in Maritime and Shipbuilding Ecosystems (#2915)
	Rafael Diaz, Katherine Smith, Serena Bertagna and Vittorio Bucci

12:00 - 12:20	Integrated Security Information and Event Management (SIEM) with Intrusion Detection System (IDS) for Live Analysis based on Machine Learning (#5692)
	Adabi Raihan Muhammad, Parman Sukarno and Aulia Arif Wardana

12:20 - 12:40	Exploring blockchain-based Traceability for Food Supply Chain Sustainability: Towards a Better Way of Sustainability Communication with Consumers (#3722)
	Shoufeng Cao, Hope Johnson and Ayesha Tulloch

Nov 4th, 11:20 - 13:00
Room HS6   **S5.2 - PLAT**

Platforms, applications and tools for industrial applications: conceptual and practical cases
> Join the online room

Chair: Massimiliano Pirani – *Polytechnic University of Marche, Italy*

11:20 - 11:40	Smart Poultry Management Platform with Egg Production Forecast Capabilities (#7831)
	Nikolajs Bumanis, Armands Kviesis, Anastasija Tjukova, Irina Arhipova, Liga Paura and Gatis Vitols

11:40 - 12:00	Development of Digital Twin of a Compact Bulk Feeder to Optimise its Functionality (#9618)
	Ahmed Al-Ashaab, Nik Fadilah Nek Ridzuan, Faiz Djafri and Sai Nikhil Kumar Jaini

12:00 - 12:20	Paradigms for database-centric application interfaces (#8997)
	Massimiliano Pirani, Alessandro Cucchiarelli and Luca Spalazzi

12:20 - 12:40	Modeling and controlling IoT-based devices' behavior with high-level Petri nets (#3177)
	João Paulo da Silva Fonseca, Alexandre Rodrigues Sousa and Jose J. P. Z. S. Tavares

Nov 4th, 13:00 – 14:30
University Restaurant

Networking Lunch

Nov 4th, 14:30 - 16:10

Room Audimax   **S1.3 - MINING**

Data mining role in Industry 4.0

> Join the online room

Chair: Radu Godina – *Universidade NOVA de Lisboa, Portugal*

14:30 - 14:50	Smart Trip Prediction Model for Metro Control Traffic Using Data Mining Techniques (#7640)
	Majid Mirbod and Hamidreza Dehghani

14:50 - 15:10	An intelligent data capturing framework to improve condition monitoring and anomaly detection for industrial machines (#7313)
	Steven Robyns, Stijn Helsen, Sam Weckx, Sachin Kumar Bhoi, Mohamed El Baghdadi, Omar Hegazy and Jasper De Smet

15:10 - 15:30	Variables influence analysis of gas leak testing using belief propagation over factor graphs (#1188)
	Joana Martins, Diogo Costa and Eugénio Rocha

15:30 - 15:50	A DT-CWT and Data mining based approach for High Impedance Fault Diagnosis in Micro-grid System (#3916)
	Tapaswini Biswal, Sanjoy Parida and Sanhita Mishra

Nov 4th, 14:30 - 16:10

Room HS3   **S2.3 - TWIN**

Digital Twin-Driven Smart Manufacturing (DIGTWIN)

> Join the online room

Chair: Sabrina Luftensteiner - *Software Competence Center Hagenberg GmbH, Austria*

14:30 - 14:50	Digital Twin – A Tool for Project Management in Manufacturing (#2130)
	Brian Hickey

14:50 - 15:10	Improving Virtual Sensor Models by Censored Online Data (#7409)
	Sabrina Luftensteiner and Michael Zwick

15:10 - 15:30	Sustainability in the agri-food supply chain: a combined digital twin and simulation approach for farmers (#9831)
	Sergio Gallego García, Diego Gallego-García and Manuel García-García

15:30 - 15:50   Following the Digital Thread – A Cloud-Based Observation (#8828)
Christian Daase, Christian Haertel, Abdulrahman Nahhas, Matthias Volk, Heiko Steigerwald, Achim Ramesohl, Bernd Schneider, Alexander Zeier and Klaus Turowski

15:50 - 16:10   Data Modeling and ML Practice for Enabling Intelligent Digital Twins in Adaptive Production Planning and Control (#5501)
Alessandro Chiurco, Mohaiad Elbasheer, Francesco Longo, Letizia Nicoletti and Vittorio Solina

Nov 4th, 14:30 - 16:10
Room HS4   **S3.3 - AI-ROBO**

Applications of artificial intelligence in robotic systems
> Join the online room

Chair: Bernard Werth – University of Applied Sciences Upper Austria, Austria

14:30 - 14:50   Artificial Intelligence Task Planning of Cooperating Low-Cost Mobile Manipulators: A Case Study on a Fully Autonomous Manufacturing Application (#6391)
Stefan-Octavian Bezrucav, Nils Mandischer and Burkhard Corves

14:50 - 15:10   Applications of Artificial Intelligence Techniques for trajectories optimization in robotics mobile platforms (#5568)
Juan Escobar-Naranjo, Gustavo Caiza, Paulina Ayala, Carlos A Garcia and Marcelo V Garcia

15:10 - 15:30   Data-Driven Surface Classification for Differential Drive Autonomous Guided Vehicles (#1475)
Sascha Gärtner

15:30 - 15:50   Deep learning-based robotic sorter for flexible production (#7864)
Alberto Da Rold, Marco Furiato, Ahmed Zaki, Marco Carnevale and Hermes Giberti

Nov 4th, 14:30 - 16:10
Room HS5   **S4.3 – IEEI4.0**

Roundtable: The Industrial Engineering 4.0 Education Initiative
> Join the online room

Chair: Monica Ciolacu – *University of Passau, Germany*

In this special session, the Industrial Engineering 4.0 Education Initiative will be presented. The IEEI4.0 is supported by a working group within the ISM which aims at analyzing Industry 4.0 education at international level. Representatives from Italy, Austria, Germany and Romania will provide interesting data and a roundtable will be set up to share experiences and ideas about how didactics and teaching is changing for industrial engineering topics. During the session, the following talks will be held:

Fostering Engineering Education 4.0 Paradigm - Facing the Pandemic and VUCA World (#2275)
Monica Ionita Ciolacu, Catalin Gheorghe Amza, Tamara Rachbauer, Christina Hansen, Bogdan Mihailescu and Paul Svasta

The Industrial Engineering 4.0 Education: an overview of the Italian context
Martina Cardamone – MSC-LES-DIMEG, University of Calabria, Italy

Nov 4th, 14:30 - 16:10

Room HS6 **S5.3 - SMALLDERS**

Special Session: The SMALLDERS project

> Join the online room

Chair: Francesco Longo – *University of Calabria, Italy*

In this special session, presentations from the partners of the SMALLDERS project will be carried out in an open format in order to present the project results and interact with the audience with the aim to establish connections and possible cooperation opportunities. The SMALLDERS project aims to identify a framework that exploits innovative strategies, methodologies, technologies and business models to increase the resilience of small-scale farms in the Mediterranean area, to effectively and efficiently face unexpected and disruptive events such as the COVID-19 pandemic. The project also aims to bring technological improvements in order to reduce water consumption, to improve storage conditions, to reduce food waste. The specific objectives of the project are the following:

- *Increasing saleability and perceived value of smallholder products, to be resilient and address any supply chain disruption in the event of a crisis.*
- *Increasing smallholder products traceability, quality, and safety.*
- *Helping smallholders to cope with the shortage of workforce due to COVID-like crises.*
- *Helping smallholders to increase farm production efficiency.*
- *Increasing the Multi-Capital Sustainability of smallholders' processes.*

The SMALLDERS project includes case studies in 4 different countries: Italy, France, Spain, Tunisia.

During the session, the following paper will be presented:

An overview of approaches and methodologies for supporting smallholders: ICT tools, blockchain, business models, sustainability indicators, simulation models (#6402)

Francesco Longo, Giovanni Mirabelli, Vittorio Solina, Laura Belli, Chaima Ben Abdallah, Oussama Ben-Ammar, Eleonora Bottani, José Manuel García-Gallego, Manuella Germanos, Francisco Javier Miranda González, Sergio Rubio Lacoba, Lilia Sidhom, Giuseppe Vignali, Gregory Zacharewicz

Nov 4th, 16:10 – 16:40

Networking Coffee Break

Nov 4th, 16:40 - 18:20

Room Audimax **S1.4 - ENERGY**

Energy efficiency and sustainability in production and in the maritime industry

> Join the online room

Chair: Radu Godina – *Universidade NOVA de Lisboa, Portugal*

16:40 - 17:00   A fast feasibility tool for the assessment of fuel switch in the concept design of merchant ships (#4219)
Serena Bertagna, Luca Braidotti, Valentina Bortuzzo, Alberto Marinò and Vittorio Bucci

17:00 - 17:20   Effective Training of Seafarers on Energy Efficient Operations of Ships in the Maritime Industry (#9379)
Mohammud Hanif Dewan and Radu Godina

| 17:20 - 17:40 | Seafarers Involvement in Implementing Energy Efficiency Operational Measures in Maritime Industry (#8008) |
| | *Mohammud Hanif Dewan and Radu Godina* |

| 17:40 - 18:00 | Towards Energy-Efficient Scheduling and Routing of Multiple AGVs with Multi-Agent Reinforcement Learning (#9393) |
| | *Xianfeng Ye, Zhiyun Deng, Yanjun Shi and Weiming Shen* |

Nov 4th, 16:40 - 18:20

Room HS3   **S2.4 - IMAGE**

Image processing and analysis: applications and novel results in smart factories

> Join the online room

Chair: Eugenio Rocha – *University of Aveiro, Portugal*

| 16:40 - 17:00 | Spatial change recognition model using artificial intelligence to remote sensing (#1145) |
| | *Majid Mirbod, Babak Rezaei and Mehrnoosh Najafi* |

| 17:00 - 17:20 | Causality-Aware Convolutional Neural Networks for Advanced Image Classification and Generation (#1646) |
| | *Vagan Terziyan and Oleksandra Vitko* |

| 17:20 - 17:40 | Convolutional neural networks for identification of moving combustion chambers entering a brazing process (#1343) |
| | *Rui Pereira, Eugénio M. Rocha, Diogo Pinho and José Paulo Santos* |

| 17:40 - 18:00 | The Truth is Out There: Focusing on Smaller to Guess Bigger in Image Classification (#7939) |
| | *Vagan Terziyan, Olena Kaikova, Diana Malyk and Vladyslav Branytskyi* |

Nov 4th, 16:40 - 18:20

Room HS4   **S3.4 - SCM**

The digitalization of supply chain: challenges and opportunities from a managerial perspective

> Join the online room

Chair: Barbara Bigliardi – *University of Parma, Italy*

| 16:40 - 17:00 | A review of supply chain 4IR management strategy for appraising the manufacturing industry's potentials and shortfalls in the 21st century (#9141) |
| | *Makinde Oluwafemi Ajayi and Opeyeolu Timothy Laseinde* |

| 17:00 - 17:20 | Technology Outsourcing of 3PL firm in a B2B contractual agri-supply chain (#1700) |
| | *Arkajyoti De and Surya Prakash Singh* |

| 17:20 - 17:40 | Current State of the Inter-Organizational Information Exchange Strategies of German SME - A Survey (#9761) |
| | *Laura Sophie Thiele and Diana Peters* |

| 17:40 - 18:00 | Information sharing and multi-tier supply chain management of SMEs in the context of Industry 4.0 (#3081) |
| | *Matthias Winter, Silvia Dopler, Julian M. Müller and Alexander Zeisler* |

| 18:00 - 18:20 | Prioritising Visibility Influencing Factors in Supply Chains for Resilience (#144) |

Funlade Sunmola, Patrick Burgess, Albert Tan, Janya Chanchaichujit, Sreejith Balasubramania and Mustafa Mahmud

Nov 4th, 16:40 - 18:20

Room HS5   **S4.4 - ECON**

Economics and financial perspectives on Industry 4.0 in developing economies and sectors

> Join the online room

Chair: Manuela Ingaldi – *Czestochowa University of Technology, Poland*

16:40 - 17:00   Infrastructure Network Support and Leapfrogging Africa to Industry 4.0: The Case of Tanzania (#7517)
Christopher Awinia

17:00 - 17:20   Improving Boosted Generalized Additive Models with Random Forests: A Zoo Visitor Case Study for Smart Tourism (#7732)
Sebastian Obster, Josephine Brand, Monica Ionita Ciolacu and Andreas Humpe

17:20 - 17:40   Big Data and Labour Markets: A Review of Research Topics (#3267)
Lejla Turulja, Dalia Suša Vugec and Mirjana Pejic-Bach

17:40 - 18:00   The Impact of Digital Financial Technology on Accelerating Financial Inclusion in Developing Economies (#3347)
Aviksa Mungar and Arnesh Telukdarie

Nov 4th, 18:30 – 18:45

ISM 2022 Closing Ceremony

> Join the online room

Chair: Francesco Longo – *University of Calabria, Italy*

Closing remarks and acknowledgements for the 2022 edition of the ISM. During the ceremony, the location and dates of the ISM 2023 will be announced.

18:45 – 19:45

Round up & Shuttle Bus Transfer Hagenberg > Linz
only for in-person participants

The International Doctoral Workshop @ISM is a one-day meeting where PhD students from different countries at any stage of their studies and working in subjects falling under the umbrella of Industry 4.0 have the opportunity to present their research projects, get in touch with the Industry 4.0 community and improve their technical/soft skills in an informal atmosphere. The 1st edition of the ISM International Doctoral Workshop (IDW) will be held fully online on MS Teams.

> Join the online room

09:00 – 09:30
Online – MS Teams

Welcome Messages of the IDW Board

Paolo Scala	Amsterdam School of International Business, The Netherlands
Margarita Bagamanova	Amsterdam School of International Business, The Netherlands
Emmanuel Francalanza	University of Malta, Malta

09:30 - 11:00
Online – MS Teams

> Application and Analysis of Metaheuristic Algorithms for Simulation-based Optimization with HeuristicLab

Stefan WAGNER and Andreas BEHAM
University of Applied Sciences Upper Austria, Austria

HeuristicLab [1, 2] is an open-source environment for heuristic optimization that features several metaheuristic optimization algorithms as well as optimization problems. It is developed by the research group Heuristic and Evolutionary Algorithms Laboratory (HEAL) [3] of the University of Applied Sciences Upper Austria and is based on C# and Microsoft .NET. HeuristicLab is used at the Hagenberg Campus and at other universities worldwide as development platform for several research and industry projects (for example the Josef Ressel Centers SymReg [4] and adaptOp [5]) as well as for teaching metaheuristics.
In this seminar we demonstrate how HeuristicLab can be used to solve optimization problems implemented in different applications. HeuristicLab includes a generic protocol that facilitates data exchange with arbitrary applications as well as customized interfaces that exchange data with specific programs. In the seminar a brief overview of HeuristicLab and its concepts will be given after which several concrete use cases will be presented and demonstrated.
Participants will learn different ways to connect arbitrary applications to HeuristicLab such that they can be used for solution evaluation. They will also get to know how to apply metaheuristic optimiza-tion algorithms in HeuristicLab to solve optimization problems defined in HeuristicLab, or in another application.

[1] https://dev.heuristiclab.com

[2] https://github.com/heal-research/HeuristicLab
[3] https://heal.heuristiclab.com
[4] https://www.symreg.at
[5] https://www.adaptop.at

Biographical Sketch

Stefan Wagner received his MSc in computer science in 2004 and his PhD in technical sciences in 2009, both from Johannes Kepler University Linz, Austria. From 2005 to 2009 he worked as associate professor for software project engineering and since 2009 as full professor for complex software systems at the Campus Hagenberg of the University of Applied Sciences Upper Austria. From 2011 to 2018 he was also CEO of the FH OÖ IT GmbH, which is the IT service provider of the University of Applied Sciences Upper Austria. Dr. Wagner is one of the founders of the research group Heuristic and Evolutionary Algorithms Laboratory (HEAL) and is project manager and head architect of the open-source optimization environment HeuristicLab. He works as project manager and key re-searcher in several R&D projects on production and logistics optimization and his research interests are in the area of combinatorial optimization, evolutionary algorithms, computational intelligence, and parallel and distributed computing.

Andreas Beham received his MSc in computer science in 2007 and his PhD in engineering sciences in 2019, both from Johannes Kepler University Linz, Austria. He works as senior researcher at the R&D facility at University of Applied Sciences Upper Austria, Hagenberg Campus and is leading several funded research projects. Dr. Beham is co-architect of the open source software environment Heu-risticLab and member of the Heuristic and Evolutionary Algorithms Laboratory (HEAL) research group led by Dr. Affenzeller. He has published more than 80 documents indexed by SCOPUS and applied evolutionary algorithms, metaheuristics, mathematical optimization, data analysis, and sim-ulation-based optimization in industrial research projects. His research interests include applying dynamic optimization problems, algorithm selection, and simulation-based optimization and inno-vization approaches in practical relevant projects.

11:00 – 11:15

Coffee Break

11:15 - 13:30
Online – MS Teams

Project Presentations

It's show time. Every speaker is associated with a peer discussant, who has to prepare (at least) one question for the presenter in order to start the discussion after the presentation and break the ice.

11:15 - 11:35	A Data-Driven Platform to Support Lean Implementation and Decision-Making under the I4.0 Paradigm *Speaker: Ângela F. Brochado* *Discussant: Wolfgang Rannetbauer*
11:35 - 11:55	A Prototype of Supply Chain Implementation in Blockchain & IoT *Speaker: Mateen Ashraf* *Discussant: Valentina De Simone*
11:55 - 12:15	Machine Learning-based tools for Sustainable Production Planning and Control in SMEs *Speaker: Valentina De Simone* *Discussant: Ângela F. Brochado*

12:15 - 12:35	Clearing function-based release date optimization in a multi-item multi-stage MRP planned production system in a rolling-horizon planning environment with multilevel BOM *Speaker: Wolfgang Seiringer* *Discussant: Mateen Ashraf*
12:35 - 12:55	Practical implementation of AI/ML methodologies for Empowering Operators 4.0 in production planning and control *Speaker: Mohaiad Elbasheer* *Discussant: Wolfgang Seiringer*
12:55 - 13:15	Data-driven maintenance in the steel industry: Application, Challenges and Goals *Speaker: Wolfgang Rannetbauer* *Discussant: Mohaiad Elbasheer*
13:15 - 13:30	Final remarks, recommendations and ideas *IDW 2022 Board*

15:00 - 15:45
Online – MS Teams

> Meet the Editor

Emmanuel Francalanza - *Associate Editor, Journal of Production and Manufacturing Research*

Publishing papers might be a crucial part of science, but it can be daunting. Whether you are writing your first draft, or perfecting your 10th one, there can still be uncertainties about what the publishing process has in store. In this seminar, you will hear about the publishing process – from preparation and submission to acceptance – as well as top tips for a successful manuscript preparation and structure, and advise on topics including cover letters, responding to criticisms and how to get involved in reviewing and editing. This webinar (30 minutes + 15 minutes Q&A) is aimed at any career level, but will be especially useful for first time writers, PhD students, early career scientists and those with an interest in reviewing and editing for international journals.

15:45 - 16:00
Online – MS Teams

Closing Ceremony and Best Presentation Award
presented by the IDW 2022 Board

ISM 2022 Proceedings Publication

The ISM 2022 Conference Proceedings will be published as a dedicated issue of the Elsevier Procedia Computer Science (CiteScore 3.6). Launched in 2010, Procedia Computer Science offers a highly recognized Open Access platform where conference papers can be published and archived. Conference Authors receive maximum exposure as their work is made freely accessible to millions of researchers. Procedia Computer Science is indexed in Scopus, the Web of Science Conference Proceedings Citation Index, INSPEC, and Engineering Village.

International Journal Special Issues

After the conference, presented papers will be screened based on their scientific quality and expected impact with the purpose of recommending the authors to consider significantly extended versions in one of the ISM 2022 International Journals' Special Issues. Selected papers will be invited by direct email. Special Issues include, but are not limited to the ones reported here below. While only invited authors will be fully waived for APC, the Special Issues are also open to all ISM authors who are willing to contribute. For further information, feel free to contact the Guest Editors or the ISM 2022 Organizing Committee.

IET Collaborative Intelligent Manufacturing (ISSN 2516-8398)
IET CIM is indexed by Scopus, ESCI, Web of Science, EI, ISPEC, and DOJA and is a fully Gold Open Access journal.
Contacts: Weiming Shen - Huazhong University of Science and Technology, China; Antonio Padovano - University of Calabria, Italy
Website: https://digital-library.theiet.org/content/journals/iet-cim

Production & Manufacturing Research – Taylor Francis (ISSN 2169-3277)
A selection of papers will be shortlisted by the ISM IPC on the topic "Sustainable and Resilient Manufacturing ". PMR publishes open access research and is indexed in many scientific databases like Scopus (Q1) and WoS.
Contacts: Erwin Rauch - Free University of Bozen · Bolzano, Italy
Website: https://www.tandfonline.com/journals/tpmr20

Applied Sciences – MDPI (ISSN 2076-3417)
A selection of papers will be shortlisted by the ISM IPC on the topic "Intelligent Digital Twins: Trends and Applications in the Human-Centered Manufacturing Context". Applied Sciences is indexed in many scientific databases like Scopus and Web of Science and publishes Open Access.
Contacts: Vittorio Solina - University of Calabria, Italy; Antonio Padovano - University of Calabria, Italy
CfP: https://www.mdpi.com/journal/applsci/special_issues/3N732K2T66

ISM 2022 Awards

The ISM comes with three different awards that will be granted to the authors of presented high-quality papers. The winners will be determined by the Award Committee (different per each award) from a short list of finalists based on the gathered reviews and on their own reading of the papers. The winner certificates will be awarded during the Awards Ceremony.

The **ISM 2022 Best Paper Award** is assigned by the ISM 2022 Award International Committee and selected among the top quality papers presented at ISM based on originality, scientific quality and impact on the manufacturing domain.

The **ISM 2022 Industrial Award** is assigned by the ISM 2022 Award International Committee and selected among the top quality papers presented at ISM that have had or could have the greatest impact on industrial practice and provide relevant advances to manufacturing systems.

The **ISSIP Best Paper Award "Best Service Innovation Paper"** is assigned by ISSIP (International Society of Service Innovation Professionals) to the best paper dealing with promoting service innovation for our interconnected world and in particular in industrial domain.

The **Best Reviewer Award** is assigned to the member of the IPC who provided outstanding support during the review process of the papers submitted at the conference and whose insightful and supportive feedback has helped authors substantially improve their papers

3-11-2022 | 4-11-2022
B2B/B2S Brokerage Event @ISM2022

In the wake of the success of past editions, the ISM 2022 Organizing Committee is glad to invite you to register and join us for exciting days of networking, new knowledge exchange and business opportunities at the **B2B/B2S (Business to Business/Business to Science) Brokerage Event @ISM2022**, a unique setting where the research/science side and the entrepreneurial/business side of Industry 4.0 move close to each other. This co-located event gives enterprises, start-ups, consultants, agencies but also scholars, research institutions, labs and universities from the broad field of Industry 4.0 the possibility to get in contact with investors, potential business partners or R&D project cooperation partners.

Visit https://b2b-meetings-at-ism-2022.b2match.io/ for more information!
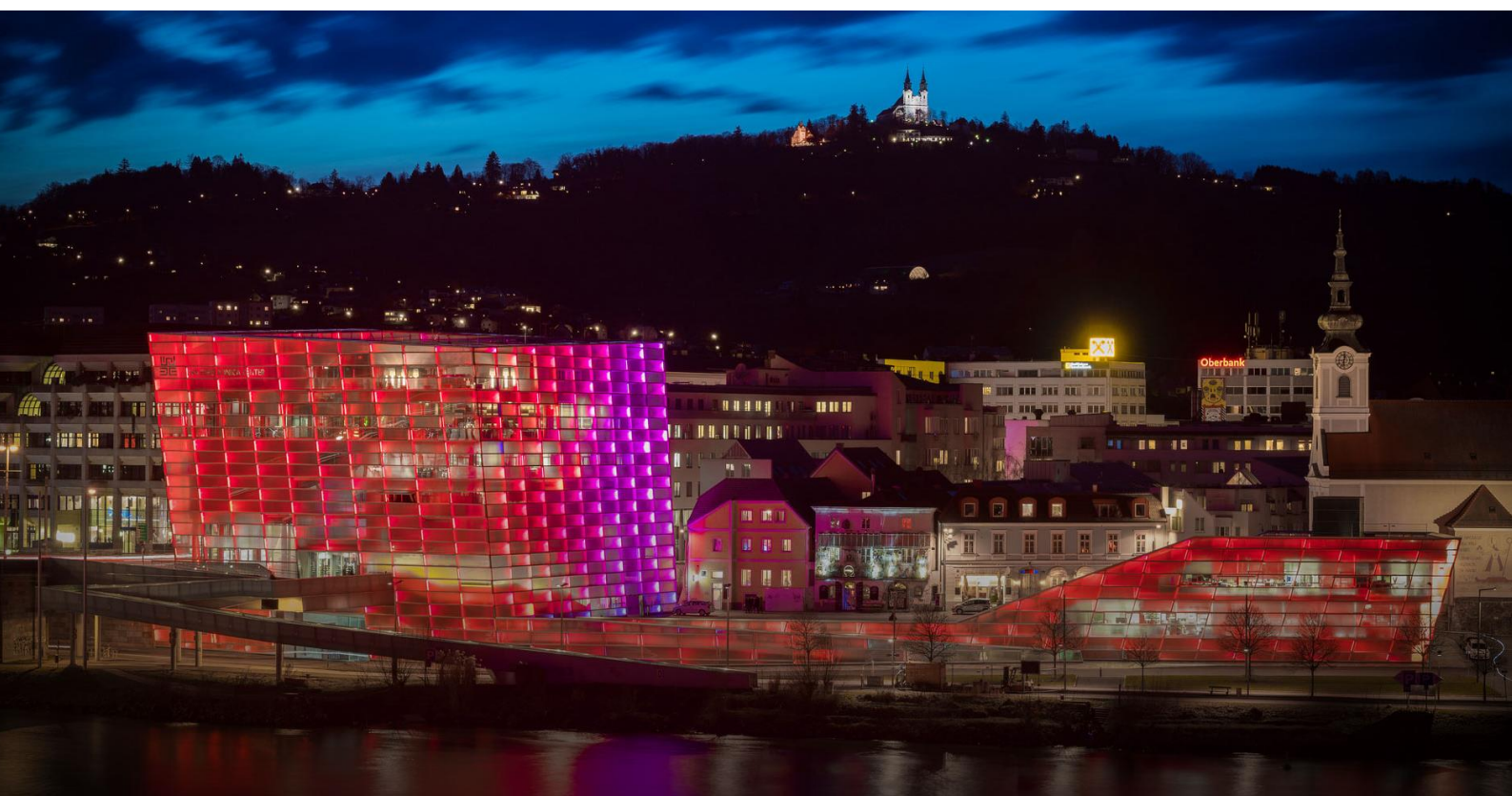
ISM 2022
Social Event

Wednesday, 2-11-2022 – Starts at 19.30
Welcome Reception Event **@Ars Electronica Center**

On Wednesday, 2nd November 2022 we invite you to the AEC – Ars Electronica Center Linz where interactive stations, works of art, research projects, large-scale projections and laboratories are presented. The Ars Electronica Center invites you to exciting and inspiring excursions into the future fields of artificial intelligence and neuroscience, robotics and autonomous mobility, as well as genetic engineering and biotechnology. Experience something that cannot be found anywhere else in the world: 16 x 9 meters of wall and another 16 x 9 meters of floor projection, laser tracking and 3D animations make the Deep Space 8K something very special indeed. Here, image worlds are projected in 8K resolution and raised to a completely new, unprecedented level. After the Deep Space 8k Session you'll enjoy a flying dinner at the rooftop restaurant.

At the end, the bus transfer will pick up the participants at 22.30 from the AEC and bring them to the Parkhotel Hagenberg.

Address: Ars-Electronica-Straße 1, 4040 Linz, Austria

ISM 2022
Gala Dinner

Thursday, 3-11-2022 | Starts at 19.30
Gala Dinner **@Pöstlingberg Schlössl**

For the Gala Dinner on Thursday, 3rd November 2022 we take you to the Pöstlingberg Schlössl on Linz's house mountain where a stunning view is awaiting you. Enjoy a marvellous evening with cultivated ambience, Austrian delicacies from the castle kitchen and fine wines from the in-house wine. An evening you are sure to remember. Dinner will start at 19.30 CET. At the end, the bus transfer will pick up the participants at 22:30 from the dinner location and bring them to the hotels: Wolfinger, Ibis, Courtyard, and Parkhotel Hagenberg.

Address: Am Pöstlingberg 14, Linz, Austria

ISM 2022
Maps and Directions

ISM 2022 will be held in the modern University of Applied Sciences Upper Austria, Hagenberg Campus, which is part of Softwarepark Hagenberg, the largest technology park for software in Central Europe. Located just 20km north of Linz, Hagenberg is an idyllic town in the beautiful Mühlviertel, in the heart of Upper Austria.

Address
FH1, Softwarepark 11, 4232
Hagenberg im Mühlkreis, Austria

In the last decade, with its unique combination of IT-related education, research and business in one place, Hagenberg has established itself as an internationally recognised center for computing and software development. The outstanding mix of the most modern technology combined with the picturesque setting of the Hagenberg castle gives the town its unique flair.

Participants will be welcome in the nearby capital of Upper Austria, Linz. Immerse yourself in the diversity of the Danube city and in the beautiful scenario of the Upper Austria, explore the city, relax in nature, browse through shops and Christmas markets.

Getting to Linz

Linz is characterised by short distances. Many locations near the Danube can be reached on foot. However, sometimes greater distances cannot be avoided, which is why we've summarised some helpful contacts for you here: https://www.linztourismus.at/en/business/meeting-destination-linz/transfer/.

Through Linz Airport
The Linz airport offers direct connection to the transport hubs Frankfurt, Vienna and Düsseldorf. Please visit the website to know more: http://www.linz-airport.com/de

Through Wien Airport
The train journey time between Vienna Airport (VIE) and Linz is around 1h 48m and covers a distance of around 203 km. The fastest train normally takes 1h 41m. The Vienna Airport (VIE) to Linz train service departs directly from Flughafen Wien and arrives in Linz Hbf. The ÖBB – Austrian Railway offer direct connections from Vienna Airport to Linz Hauptbahnhof – Central Station. You can buy tickets here: https://www.oebb.at/en/

Transportation in Linz
Information about public Transport and Taxis in Linz is available here:
https://www.linztourismus.at/en/leisure/plan-a-trip/transfers/.

ISM 2022
Maps and Directions

Getting to Hagenberg

In order to reach Hagenberg Campus, where the ISM 2022 will be held, attendees have the following options.

Dedicated ISM 2022 Shuttle Bus

Shuttle bus transfers starting from the hotels recommended on the website to the conference venue in Hagenberg will be organised to bring participants to Hagenberg in the morning and bring them back to Linz in the evening at the end of the conference sessions. The morning schedule and pickup points is indicated here below:

When	Where
08:00 a.m.	Pick-up at Courtyard Marriott Linz Hotel
08:05 a.m.	Pick-up at Ibis Linz City Hotel (Main Train Station)
08:15 a.m.	Pick-up at Classic Hotel Wolfinger (Main Square)

In addition, a driver will be available during the day with a small bus for giving attendees the possibility to get to Hagenberg before the luncheons (expected arrival: 12.45 p.m.). The schedule is provided here below. Please inform the registration desk if you are willing to use this service in order to inform the driver and guarantee a correct pickup.

When	Where
11:45 p.m.	Pick-up at Courtyard Marriott Linz Hotel
11:50 a.m.	Pick-up at Ibis Linz City Hotel (Main Train Station)
12:00 p.m.	Pick-up at Classic Hotel Wolfinger (Main Square)

The same driver will be also available in case some conference attendees need to go back to Linz in the early afternoon.

When	Where
15:00 p.m.	Pick-up in front of the Softwarepark

Furthermore, if you are staying at the Parkhotel Hagenberg, there is no need for a shuttle bus as the Softwarepark is at walking distance. However, a shuttle bus will take you back at Parkhotel Hagenberg at night after the social events planned in Linz.

Do you want to get to Hagenberg on your own?

Please visit the following websites for more information about:

- Hagenberg is linked to the capital of Linz by bus. The 311 coach provides a frequent service between Linz main train station and the campus. For details and timetables please check the OÖVV Verkehrsverbund website or the dedicated webpage at the conference website. The timetable available at the ISM website includes the stations from Hagenberg to Linz and back.

- There is a regular train service between the capital of Linz and Pregarten, which is only 4 kilometres away from Hagenberg. The journey takes about 45 minutes. The train schedule is available at www.oebb.at.

- In case you are planning to come by car on your own, there is both outdoor and underground parking available to participants in and around the software park. Car parks are indicated on the Hagenberg Campus map (see access Basement Parking; unfortunately the capacities are limited). Here you can also find full directions to Hagenberg Campus: https://www.fh-ooe.at/en/hagenberg-campus/about-us/getting-to-hagenberg/.

- Access to the underground car park is possible from 7.00 to 9.30 am. If you are arriving after this time, please ring the bell at the gate. The exit is possible at any time (the gate opens automatically). Electric car charging stations are of course available (Linz AG charging card).

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ISM 2023

Get on board the team now

Are you willing to join the Organization or Scientific Committee of the 2023 edition of the International Conference on Industry 4.0 and Smart Manufacturing? Discover the benefits and opportunities now and submit your application.

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