IFAC
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

22/23/24 June 2022

Cité des Congrès de Nantes

mim 2022

10th IFAC CONFERENCE

ON MANUFACTURING MODELLING MANAGEMENT AND CONTROL

New challenges for management and control in the Industrie 4.0 era

This booklet is printed on recycled paper to reduce the environmental impact of the conference.

Contents

About

IMT Atlantique

IMT Atlantique is **one of the top 10 engineering schools in France, and one of the top 400 universities in the world** in THE World University Ranking. It is a general engineering “grande école” financed by the Ministry of Industry and Digital Communication, and the first Institut Mines Télécom "Mines-Telecom" Technological university, founded on January 1st, 2017 from the merger of Mines Nantes and Télécom Bretagne.

IMT Atlantique is a Higher Education Institution with **first-rate research potential**, internationally recognized for its research (present in 5 disciplines in the Shanghai, QS and THE rankings). It draws on research excellence in its flagship areas and by linking scientific fields to meet the challenges of tomorrow, focusing on : cyber security, nuclear and interactions, digital transformation, environmental transformation, industrial transformation, energy transformation, health of the future and fundamental research.

DAPI

The Department of Automation, Production and Computer Science (DAPI) of IMT Atlantique is part of the current revolution **bridging the gap between the cyber and physical worlds**. DAPI’s aim is to create adaptable industrial systems making the best possible use of the available resources, while remaining true to a philosophy of sustainable development. Its research and teaching activities are organized around three main training and research fields: **Software Engineering and Distribution**, **Optimization and Decision Support** and **Robotics, Control and Interactions**. The Faculty members of DAPI and PhD students are also members of the CNRS Lab. LS2N. The department expertise spans a wide range of fundamental and applied skills including applied mathematics, operational research, industrial engineering, computer science, robotics and automatic control.

LS2N

The Laboratoire des Sciences du Numérique de Nantes (LS2N) is a new Joint Research Unit (UMR 6004) created in January 2017 from the merger of UMR IRCCyN (UMR 6597: Institut de Recherche en Communications et Cybernetique de Nantes) and LINA (UMR 6241: Laboratoire d’Informatique de Nantes Atlantique).

Bringing together **450 people at the heart of digital sciences**, this laboratory aims to significantly advance the visibility of research in Cybernetics and Computing in Nantes. Research is carried out in awareness of the societal challenges that the current digital revolution generates, by cultivating curiosity and openness to other disciplines. The complexity of the research objects studied makes it necessary to adopt a global so-called “systemic” approach in which computer concerns, (automatic) control / command and signal and image processing come together to answer the questions posed by systems that are open, interactive, communicative, ubiquitous…The laboratory is a player in innovation valuing these objects with partners in its environment.

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Founded in 1914 and headquartered in France, Desoutter Industrial Tools is a global leader in electric and pneumatic assembly and drilling tools serving a wide range of assembly and manufacturing operations, including Aerospace, Automotive, Light and Heavy Vehicles, Off-Road and General Industry. Desoutter demonstrates several key innovations in line with industry 4.0 needs and expectations, from Connected Assets to Data Driven Services.

For more information : www.desouttertools.com

Useful information

Contact

If necessary, participants can reach the organizers during the conference with the contact information below:

Email contact-mim2022@imt-atlantique.fr

Phone David Lemoine : (+33)02.51.85.83.35
Barbara Riere : (+33)02.51.85.86.30

Get to the Congress center

The conference will take place at “la Cité des Congrès de Nantes” (Congress Centre), located at

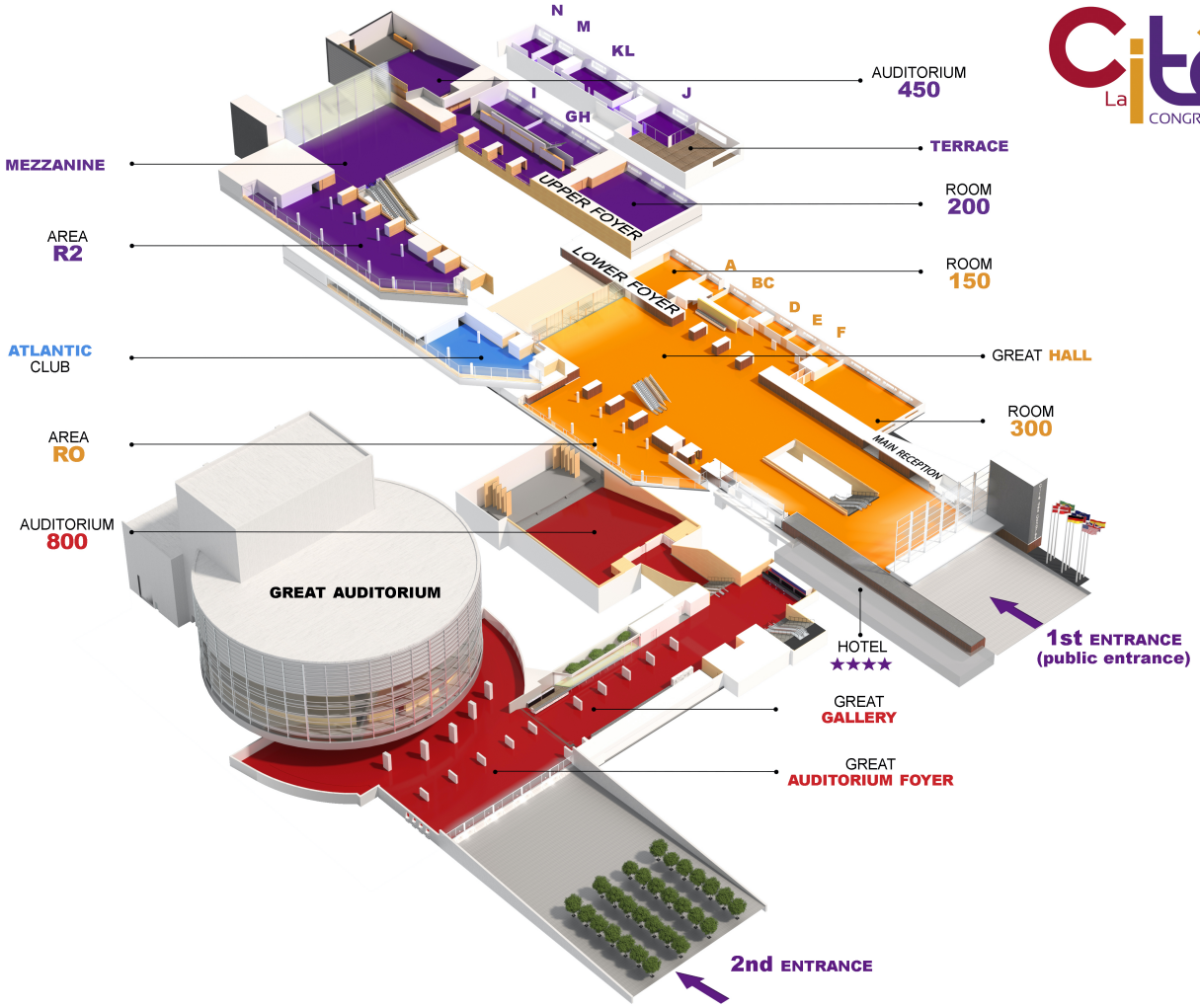
5 Rue de Valmy
44000 Nantes

Participants can access the center (see the city map on page 9):

- **By bus** via lines C4 (stop “Cité des Congrès”), C5 (stop “Gare Sud”), or from the airport via the Airport Shuttle (stop “Lieu Unique”)

- **By bike** using the “Bicloo” bike-sharing service has many stations in the city centre, including one next to the Congress Center

Plan of the Congress Center (Cité des Congrès de Nantes)

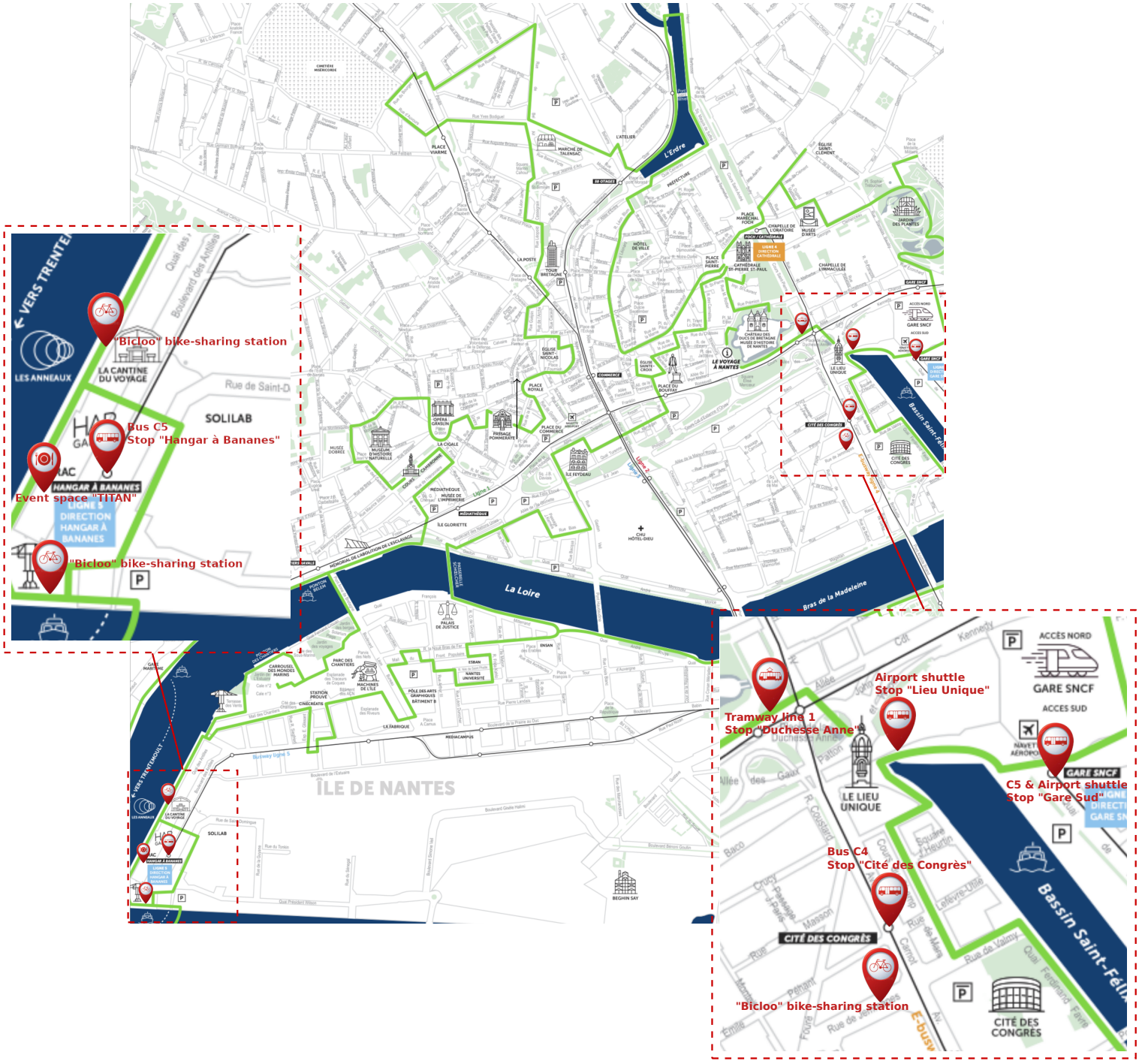


Rooms B3.17, B3.19, B3.20 are located on the Upper Foyer, close to the Auditorium 450 and Room 200

Coffee breaks will be offered in the Mezzanine area.

Lunch will be served in the Area R2.

Nantes: City map



The **Gala diner** will take place at :

Event space "TITAN"
21, quai des Antilles (Hangar à Bananes) | 44200 Nantes

To get there:

By public transportation : Bus line C5 starts from "Gare Sud" and goes to "Hangar à Bananes" (bus terminus)

By car : Approx. 10 minutes from the Congress Centre

By foot : Approx. 45 minutes from the Congress Centre

By bike : Using the "bicloo" bike sharing system, approx. 15 minutes from the station in front of the Congress Centre to the station "Hangar à Bananes"

Program at a glance

Wednesday	Thursday	Friday
	8:15 **Parallel session IV**	8:15 **Parallel session VIII**
9:00 **Opening ceremony** *Auditorium 450*		
9:45 **Keynote lecture 1** Pr. David Simchi-Levi *Auditorium 450*	9:55 **Coffee break** *Mezzanine*	9:55 **Coffee break** *Mezzanine*
10:30 **Coffee break** *Mezzanine*	10:15 **Keynote lecture 4** Pr. Michael Pinedo *Auditorium 450*	10:15 **Keynote lecture 6** Pr. Alain Bensoussan *Auditorium 450*
11:00 **Parallel session I**	11:00 **Parallel session V**	11:00 **Parallel session IX**
12:40 **Lunch break** *Espace R2*	12:40 **Lunch break** *Espace R2*	12:40 **Lunch break** *Espace R2*
14:00 **Parallel session II**	14:00 **Parallel session VI**	14:00 **Industrial Plenary** *Auditorium 450*
		14:45 **Parallel session X**
15:40 **Coffee break** *Mezzanine*	15:40 **Coffee break** *Mezzanine*	16:25 **Coffee break** *Mezzanine*
16:15 **Keynote lecture 2** Pr. Volodymyr Babich *Auditorium 450*	16:15 **Keynote lecture 5** Pr. Gisela Lanza *Auditorium 450*	
17:00 **Parallel session III**	17:00 **Parallel session VII**	17:00 **IJPR** 60th Anniversary *Auditorium 450*
		17:30 **Meet the editors** *Auditorium 450*
		18:00 **Closing ceremony** *Auditorium 450*
18:40 **Keynote lecture 3** Pr. Dimitris Mourtzis *Auditorium 450*		
	19:30 **Gala diner** *Event space TITAN*	

Keynote lectures

Wednesday

From Data to Science and Back

David Simchi-Levi

9:45-10:30
Auditorium 450

Professor of Engineering Systems & Director of the Data Science Lab MIT

In this talk I will describe my journey in the applications of data science to operations. I will start by showing how the development of personalized offering in the airline industry led to a new statistical learning method. We than describe how a new approach for experimental design generated data that allowed the evaluation of machine learning based pricing algorithm. Finally, we show how pre-pandemic research generated significant impact during the pandemic by allowing companies to increase supply chain resiliency.

Professor Simchi-Levi is the current Editor-in-Chief of Management Science, one of the two flagship journals of INFORMS. He served as the Editor-in-Chief for Operations Research (2006-2012), the other flagship journal of INFORMS and for Naval Research Logistics (2003-2005). He is an INFORMS Fellow, MSOM Distinguished Fellow and the recipient of the 2014 INFORMS Daniel H. Wagner Prize for Excellence in Operations Research Practice; 2014 INFORMS Revenue Management and Pricing Section Practice Award; 2009 INFORMS Revenue Management and Pricing Section Prize and Ford 2015 Engineering Excellence Award. He was the founder of LogicTools which provided software solutions and professional services for supply chain optimization. LogicTools became part of IBM in 2009. In 2012 he co-founded OPS Rules, an operations analytics consulting company. The company became part of Accenture in 2016. In 2014, he co-founded Opalytics, a cloud analytics platform company focusing on operations and supply chain intelligence. The company became part of the Accenture Applied Intelligence in 2018.

Playing with DISASTER: a Behavioral Simulation Platform of Supply Shortages, Competition for Supplier Capacity, Blockchain-enabled Strategic Information Sharing, and Markets for Capacity-Token Trading.

Volodymyr Babich

16:15-17:00
Auditorium 450

Professor of Operations and Information Management at the McDonough School of Business, Georgetown University

Blockchain technology allows the creation of incorruptible records of a firm's orders and the anonymous sharing of these records with other firms in the industry. Blockchain technology also facilitates the creation of markets among retailers for trading tokens that represent claims on the supplier capacity. Using the online platform we created (called DISASTER), we conduct behavioral simulations to study the effects of supply shortages, information sharing on supply shortages, and markets for supplier capacity. These experiments offer insights into the present and the future of supply chains: why supply chain shortages can persist even after the current capacity constraints are lifted, what information accelerates order inflation and the Bullwhip Effect, what trading strategies emerge in markets for supply chain resources, and how well clearing prices in these markets reflect the value of the supplier's capacity for the retailers.

Volodymyr Babich is a Professor of Operations and Information Management at the McDonough School of Business, Georgetown University. He was a Visiting Associate Professor at the London Business School, a Visiting Scholar at the University of Chicago Booth School of Business and Wharton School at the University of Pennsylvania, and an Assistant Professor at the University of Michigan, Ann Arbor. He earned his Ph.D. in Operations Research from Case Western Reserve University, Weatherhead School of Management. He holds M.S. degrees in Management Science and in Mathematics.

Professor Babich's research interests are the interface of operations and finance, supply risk management, supply chain management, energy and sustainability, entrepreneurship, innovative operations technologies, stochastic modeling, and risk management. His research has been supported by the National Science Foundation, and various university and industry grants. His papers have been published in the leading Operations Research, Operations Management, and Industrial Engineering journals. Prof. Babich serves as an associate editor for Management Science, M&SOM, and Naval Research Logistics, and as a senior editor for Production and Operations Management journals. He is an active member of INFORMS and the MSOM society and has served twice as the Chair of the MSOM Special Interest Group on the Interface of Finance, Operations, and Risk Management (iFORM).

Artificial Intelligence for Production Management and Control towards Mass Personalization in Industry 4.0

Dimitris Mourtzis

Professor of Manufacturing Systems and Director of the Laboratory of Manufacturing Systems and Automation, University of Patras

18:40-19:30
Auditorium 450

The Mass Personalization (MP) paradigm is already a reality and has increased the involvement/engagement of end-users in the product lifecycle. It requires responsive and flexible manufacturing operations to produce cost-effective individualized products in dynamic batch sizes at scale taking into consideration the unique preferences of each customer. Therefore, modern manufacturing systems must be capable of responding quickly to changing demands and conditions in the factory, supply chain, and customer needs. However, current manufacturing systems, have not yet fully adapted to dynamic production environments by changing system configurations and production plans while maintaining stable production output. As a result, in the context of MP, a manufacturing system must be capable of self-optimizing manufacturing operations in order to achieve flexible, autonomous, and error-tolerant production. Based on the above-mentioned, the ability of a company to build effective data collection and processing methodology that orchestrate data flows, and then draw meaningful and actionable insights from them, is critical to MP success. As such, the technological drivers of MP are the Big Data Sets and Artificial Intelligence (AI) among other pillar technologies of Industry 4.0. This keynote talk aims to identify and highlight the state-of-the-art on how the integration of AI and Big Data technologies and techniques in the production management and control will contribute towards the efficient personalization of each customer's experience under the framework of Industry 4.0 and beyond.

Dimitris Mourtzis is a Professor in the Department of Mechanical Engineering and Aeronautics of the University of Patras, Vice President of Research and Development of University of Patras, Governing Board Member of the University of Patras at the Clean Aviation Joint Undertaking, Director of Laboratory for Manufacturing Systems and Automation and Founding Member of the Teaching Factory Competence Center. He is a Fellow of the International Academy for Production Engineering (CIRP), the International Federation of Automatic Control (IFAC) Manufacturing Modelling for Management and Control (IFAC TC5.2), the International Federation of Information Processing IFIP WG 5.7-Advances in Production Management Systems. Professor Mourtzis is member of numerous scientific associations including the American Society of Mechanical Engineers (ASME), the Society of Manufacturing Engineers (SME), the Presidential Board of the International Association of Learning Factories (IALF), the European Factories of the Future Association–EFFRA, the European Manufacturing and Innovation Research Association (EMIRACLE), the European Aeronautics Science Network / Association EASN and others. His scientific interests focus on the Design, Planning and Control of Manufacturing Systems and Networks, Robotic Systems, Automation, Augmented, Mixed, and Virtual Reality in Manufacturing, and Manufacturing Processes Modelling and Energy Efficiency. Furthermore, his research interests are also focused on the design, development and implementation of solutions based on the utilization of cutting-edge digital technologies, such as Cloud Technologies, as well as on the development of Product-Service Systems (PSS). He is also actively involved in the Digital Transformation of Manufacturing Companies and Implementation of Industry 4.0 practices. He has published more than 290 publications including refereed journal papers, editorials, book chapters and conference proceedings with a total number of more than 9.300 unique citations (h-index 49). He is also Member of the Editorial Board of several Scopus Indexed International Journals and Guest Editor in a number of Special Issues.

Thursday

Artificial Intelligence for Production Management and Control towards Mass Personalization in Industry 4.0

Michael Pinedo

10:15-11:00
Auditorium 450

Professor of Operations Management in the Department of Information, Operations and Management Sciences
Stern School of Business, New York University

Efficient scheduling of industrial systems typically have a major impact on their productivity levels. In this presentation we focus on scheduling applications in two different industries, both being of importance, namely steelmaking and microelectronics. In steel production the steelmaking-continuous casting (SCC) process is a bottleneck. Its scheduling has become more challenging over the years. We first describe the modeling of the essential features of an SCC process, such as unrelated parallel machine environments, stage skipping, and maximum waiting time limits in between successive stages. The objective is the minimisation of the total weighted waiting time, total earliness, and total tardiness. The problem can be formulated as a mixed integer program and we present an iterated greedy matheuristic that solves its subproblems to find a near-optimal solution. Through numerical experiments, we show the effectiveness of such an algorithm. The microelectronics industry is conceptually very different from the steel making industry. The manufacturing processes in a wafer fab can be modeled as flow shops with re-entry, which are special cases of job shops with recirculation. The re-entries of the orders make the associated scheduling problems conceptually very difficult. We discuss the properties of the optimal schedules for various different objective functions. We conclude this presentation with various other scheduling applications in industry that deserve research attention.

Michael Pinedo is the Julius Schlesinger Professor of Operations Management in the Department of Technology, Operations, and Statistics at New York University Leonard N. Stern School of Business. From 1982 to 1997 he taught in the Industrial Engineering and Operations Research department at Columbia University. He taught at the Instituto Venezolano de Investigaciones Cientificas (Caracas) from 1978 to 1980 and at the Georgia Institute of Technology from 1980 to 1982. Professor Pinedo received an Ir. degree in Mechanical Engineering from the Delft University of Technology in 1973, and both an M.Sc. and Ph.D. in Operations Research from the University of California at Berkeley in 1978.

Professor Pinedo's research focuses on the modeling of production and service systems, more specifically, on the planning and scheduling of these systems. Recently, his research has focused on operational risk in financial services. He has both authored and co-authored numerous technical papers on these topics. He is the author of the books Scheduling: Theory, Algorithms, and Systems (Springer), and Planning and Scheduling in Manufacturing and Services (Springer), and the coauthor of Queueing Networks: Customers, Signals and Product Form Solutions (Wiley). He is co-editor of Creating Value in Financial Services: Strategies, Operations, and Technologies (Kluwer), and editor of Operational Control in Asset Management - Processes and Costs (Palgrave/McMillan). Over the last two decades,

Professor Pinedo has been involved in industrial systems development. He supervised the design, development, and implementation of two planning and scheduling systems for the International Paper Company. He also actively participated in the development of systems at Goldman Sachs, Philips Electronics, Siemens, and at Merck. Professor Pinedo is currently editor of the Journal of Scheduling (Wiley). He is also associate editor of Management Science, associate editor of Naval Research Logistics, department editor of Production and Operations Management, associate editor of Manufacturing and Services Operations Management, and associate editor of the Journal of Operational Risk.

Enabling changeable production by utilizing digital twins

Gisela Lanza

16:15-17:00
Auditorium 450

Professor. DR.-ING. Director of Production Systems at the Karlsruhe Institute of Technology (KIT)

Due to the trends of individualization and mass customization, production systems and networks must be flexible and able to adapt to changing requirements. However, finding the right degree of flexibility and taking the right change measures at the right time is a difficult decision problem requiring foresight in complex environments. Digital twins can enable manufacturing companies to appropriately address this complexity by allowing for profound strategic and operational decision-making. First of all, a definition, the role and function of digital twins in the context of Industry 4.0 is provided. Second, various use cases for digital twins in production are presented. Finally, requirements are aggravated by specifying and shaping a vision of an omnipotent digital twin for the changeable factory of the future.

Prof. Dr.-Ing. Gisela Lanza is member of the management board at the Institute of Production Science (wbk) of the Karlsruhe Institute of Technology (KIT). She heads the Production Systems division dealing with the topics of global production strategies, production system planning, and quality assurance. In 2009 she received the Heinz Maier-Leibnitz award of the German Research Foundation (DFG), and was awarded in 2016 with the Federal Cross of Merit on Ribbon. She is an active member of the scientific advisory board of the German Academy of Engineering Sciences (acatech) and the national platform Industry 4.0, as well as of the Steering Committee of the Allianz Industrie 4.0 Baden-Württemberg. In numerous basic and collaborative projects, Mrs. Lanza deals with the development of analytical methods for the identification and improvement of given weak points of a production system.

Friday

Major challenges of Risk Management in industry

Alain Bensoussan

10:15-11:00
Auditorium 450

Professor of Risk and Decision Analysis Lars Magnus Ericsson Chair

We present in this lecture the major challenges of Risk Management in industry, at a time when complexity intensifies. This justifies the introduction of a Risk Management culture and of a stringent risk organization in big industry, which procure very complex systems. We illustrate the discussion with a presentation of the Boeing 737 Max case study, which contains many important aspects, from which a risk management analysis can be derived, in a more concrete manner. Of course, not all aspects can be covered by a concrete case, but major ones are present.

Alain Bensoussan is Lars Magnus Ericsson Chair and the Director of ICDRiA (International Center for Decision and Risk Analysis) at the University of Texas at Dallas He is also Chair Professor of Risk and Decision Analysis at the City University Hong Kong. He has been for 4 years World Class University Distinguished Professor at Ajou University, Korea . He is Professor Emeritus at the University Paris Dauphine. Professor Bensoussan served as President of National Institute for Research in Computer Science and Control (INRIA) from 1984 to 1996; President of the French Space Agency (CNES) from 1996 to 2003; and Chairman of the European Space Agency (ESA) Council from 1999 to 2002. He is a member of the French Academy of Sciences, French Academy of Technology, Academia Europaea, and International Academy of Astronautics. His distinctions include AMS Fellow, IEEE Fellow, SIAM Fellow, Von Humboldt award, and the NASA public service medal. Professor Bensoussan is a decorated Officer of Legion d'Honneur, Commandeur Ordre National du Merite from France and Officer Bundes Verdienst Kreuz from Germany. He has received the W.T. and Idalia Reid Prize from SIAM in 2014.

He has an extensive research background in stochastic control, risk analysis and decision making. He has published 13 books and more than 400 papers and proceedings. He develops a comprehensive approach to Risk Analysis, to apprehend technical and socio-economic risks simultaneously. He has experience in aerospace and information technology industries. His main focus is presently in the energy sector.

Parallel sessions

Wednesday, 11:00-12:40 – Parallel sessions I

Lean and Six Sigma in Services Healthcare - 1

Wed. 11:00–12:40
Room G

11:00-11:20	HFMEA-Fuzzy Model: Risk Assessment of 47 Emergency Care Units (ECU's) *Ribeiro Cosenza, Harvey José Santos, Silva, Nilra do Amaral Mendes, Barbosa Sobral, Ana Paula, Nascimento, Stephanie D'Amato, Calado, Robisom*
11:20-11:40	Patient Flow Optimization: SMED Adoption in Emergency Care Units *Bonamigo, Andrei, Bernardes, Patricia, Conrado, Luiz Felipe, Torres, Luis Fernando, Calado, Robisom*
11:40-12:00	Queue Theory: A Bibliometric Approach to Contributions and Applications in the Field of Health Service Management Problems *Beraldi Santos, Alexandre, Calado, Robisom, Zeferino, Ana, Bourguignon, Saulo Cabral*
12:00-12:20	DMAIC in Improving Patient Care Processes: Challenges and Facilitators in Context of Healthcare *Reis, Milena Estanislau Diniz Mansur dos, Abreu, Melissa, Braga Neto, Olavo, Viera, Luis Enrique, Torres, Luis Fernando, Calado, Robisom*
12:20-12:40	Fast Track in UPAS 24 H: Analysis of Opportunities and Continuous Improvements with the Use of IRAMUTEQ *Amaral Chaves, Sandra Maria do, Calado, Robisom, Viera, Luis Enrique, De Souza Ramos, José Ricardo, Rodrigues, Luiz Eduardo de Morais, Moreira Gama, João Marcelo, Braga Neto, Olavo, Bourguignon, Saulo Cabral*

Decision Analytics and Digitization for End-To-End Supply Chain Transformation - 1

Wed. 11:00–12:40
Room H

11:00-11:20	Joint Optimization of Bunker Fuel and Vessel Speed Considering Delay and Carbon Emission *Das, Jyotirmoy Nirupam, Mandal, Jasashwi, Date, Hema, Tiwari, Manoj K*
11:20-11:40	Digital Operations Scheduling, Workflow Management, and Performance Measures of Factors Responsible for Disruption in Industry 4.0 Supply Chain *Shukla, Mayank, Tiwari, Manoj K*
11:40-12:00	MCDM Approach to Select IoT Devices for the Reverse Logistics Process in the Clinical Trials Supply Chain *Badulescu, Yvonne, Tiwari, Manoj K, Cheikhrouhou, Naoufel*
12:00-12:20	Machine Learning for the Future Integration of the Circular Economy in Waste Transportation and Treatment Supply Chain *Hmamed, Hala, Cherrafi, Anass, Benghabrit, Youssef*
12:20-12:40	Scaling up the Digitalization of the Public Distribution System: A Covid-19 Pandemic Impetus *Kumar, Ramesh, Ganapathy, L, Gokhale, Ravindra S., Tiwari, Manoj K*

Intelligent Methods and Tools Supporting Decision Making in Manufacturing Systems and Supply Chains - 1

Wed. 11:00–12:40
Room I

11:00-11:20	Balance Efficient Shuttle Routing and Fast Order Execution on a Vehicle Compound *Sprodowski, Tobias, Hoff-Hoffmeyer-Zlotnik, Marit, Freitag, Michael*
11:20-11:40	Modelling Framework for Reinforcement Learning Based Scheduling Applications *Steinbacher, Lennart Markus, Ait Alla, Abderrahim, Rippel, Daniel, Düe, Tim, Freitag, Michael*
11:40-12:00	An Ant Approach to Define Product Families and Remanufacturing Cells *Mejia-Moncayo, Camilo, Rojas, Alix E., Kenne, Jean-Pierre, Hof, Lucas*
12:00-12:20	Making Decisions in Highly Uncertain and Opportunistic Environments: Towards a Decision Support System for Sales and Operations Planning *Fakhry, Danielle, Oger, Raphael, Lauras, Matthieu*
12:20-12:40	Supply Chain Resilience in Turbulent Times: Conceptual Model and Real-World Use Case *Alvim, Silvio Luiz, Viel de Farias, Ingra, Frazzon, Enzo Morosini, de Simas, Davi*

Assembly Line Balancing and Scheduling Problems - 1

Wed. 11:00–12:40
Room J

11:00-11:20	Influence of Task Time Variation in Adopting Walking Worker Assembly Systems: A Design Approach *Calzavara, Martina, Faccio, Maurizio, Finco, Serena, Persona, Alessandro, Zennaro, Ilenia*
11:20-11:40	Mixed-Model Assembly Line Balancing and Scheduling with Uncertain Assembly Times in Remanufacturing *Liu, Qingtao, Song, Jiayao, Lv, Jingxiang, Tang, Ou, Zhang, Zeyu*
11:40-12:00	Parallel Assembly Line Balancing Model with Tooling Consideration and Demand Fulfilment (ALBPTD) *Alhomaidi, Esam, Askin, Ronald*
12:00-12:20	A Case Study on the Integration of Assembly Line Balancing and Feeding Decisions *Schmid, Nico André, Montreuil, Benoit, Limère, Veronique*
12:20-12:40	A Survey on Benders Decomposition Methods Applied to Assembly Line Balancing Problems *Michels, Adalberto Sato, Stall Sikora, Celso Gustavo*

City Logistics in the Age of Sustainability and Sharing Economy - 1

Wed. 11:00–12:40
Room KL

11:00-11:20	Automated Delivery Robots: A Vehicle Routing Problem on Last Mile Delivery Cost Per Unit Based on Range and Carrying Capacity *Perrinaud, Corentin, Saraceni, Adriana*
11:20-11:40	Quantifying Smart Parcel Station Network Usage As a Logistical Solution for the Last-Mile Problem *Sweidan, Abdulla, Elomri, Adel, Kerbache, Laoucine*
11:40-12:00	A Simulation-Based Optimization Model for the Vehicle Routing Problem with Bimodal Stochastic Travel Time Distribution *Antit, Amina, Jaoua, Amel, Layeb, Safa, Triki, Chefi*
12:00-12:20	Developing a Conceptual Business Model Framework for Shared Electric-Micromobility Services: A Systematic Literature Review *Song, Minli*

Human-Centered Production and Logistics Systems of the Future - 1

Wed. 11:00–12:40
Room M

11:00-11:20	Potential of Mobile Applications in Human-Centric Production and Logistics Management *Zhang, Minqi, Grosse, Eric, Glock, Christoph*
11:20-11:40	Considering Physical Workload and Workforce Diversity in a Collaborative Assembly Line Balancing (C-ALB) Optimization Model *Keshvarparast, Ali, Battaïa, Olga, Pirayesh, Amir, Battini, Daria*
11:40-12:00	Real-Time Postural Training Effects on Single and Multi-Person Ergonomic Risk Scores *Berti, Nicola, Finco, Serena, Guidolin, Mattia, Reggiani, Monica, Battini, Daria*
12:00-12:20	An Action-Based Model to Identify Human Competencies through the Trace of Actions: Case of a Building Energy Engineering Company *Mlaouhi, Kaouthar, Cholez, Céline, Gzara, Lilia*

Sustainable Scheduling

Wed. 11:00–12:40
Room N

11:00-11:20	The Role of Environmental Factors in the Flexible Job-Shop Scheduling Problem: A Literature Review *Hassanchokami, Masoumeh, Vital-Soto, Alejandro, Olivares-Aguila, Jessica*
11:20-11:40	Simultaneous Job-Shop Scheduling and Maintenance Planning with Energy Consideration *Gupta, Shrajal, Jain, Ajai*
11:40-12:00	Permutation Flowshop Scheduling Problem with Total Core Idle Time Minimization *Sanchez-de-los-Reyes, Paula, Perez-Gonzalez, Paz, Framinan, Jose M*
12:00-12:20	Energy-Efficient Job Shop Scheduling Considering Processing Speed and Incentive-Based Programs *Füchtenhans, Marc, Glock, Christoph*

Data-Driven Manufacturing Decision Making - 1

Wed. 11:00–12:40
Room B317

11:00-11:20	Predicting Makespan in Flexible Job Shop Scheduling Problem Using Machine Learning *Tremblet, David, Thevenin, Simon, Dolgui, Alexandre*
11:20-11:40	The Development Process of Responsible AI: The Case of ASSISTANT *Buchholz, Johan, Lang, Benedict, Vyhmeister, Eduardo*
11:40-12:00	Knowledge Graphs in Digital Twins for Manufacturing - Lessons Learned from an Industrial Case at Atlas Copco Airpower *Meyers, Bart, Van Noten, Johan, Lietaert, Pieter, Tielemans, Bavo, Hristov, Hristo, Maes, Davy, Gadeyne, Klaas Jan*
12:00-12:20	Domain Models and Data Modeling As Drivers for Data Management: The ASSISTANT Data Fabric Approach *Ostberg, P.-O., Vyhmeister, Eduardo, Gonzalez-Castañé, Gabriel, Meyers, Bart, Van Noten, Johan*
12:20-12:40	Mixed-Model Assembly Line Design with New Product Variants in Production Generations *Hashemi Petroodi, Seyyed Ehsan, Thevenin, Simon, Dolgui, Alexandre*

RS12-Inventory Control, Production Planning and Scheduling - 1

Wed. 11:00–12:40
Room B319

11:00-11:20	Inventory Control in Supply Chain: A Model-Free Approach *Nyakam Nya, Danielle, Hachour, Samir, Abouaïssa, Hassane*
11:20-11:40	A Queueing-Inventory System in Which Customers Can Orbit During the Service *Hanukov, Gabi*
11:40-12:00	The Newsvendor Problem with a Non-Stationary Demand Process and Exact Accounting of Holding Costs *Miness, Ahiad, Avinadav, Tal*
12:00-12:20	Inventory Management: Bi-Objective Optimization Models for Mass Customization *Hernandez-Ruiz, Kenneth Edgar, Gonzalez-Tamayo, Lizbeth Alicia*

RS19-Mecanique, Control - 1

Wed. 11:00–12:40
Room B320

11:00-11:20	Process Capability Indices Robust Based on Entropic Concepts *Manzi, João, Bispo, Heleno*
11:20-11:40	Predicting the Moisture Content of Organic Wheat in the First Stage of Tempering *Parrenin, Loïc, Agard, Bruno, Danjou, Christophe, Beauchemin, Robert*
11:40-12:00	Activity Combination and Optimization Method to Support Rapid Establishment of Product Research & Development Process *Qiao, Lihong, Li, Yuhu, Kong, Xianglong, Zhicheng, Huang, Chen, Zhihao, Shao, Peilin*
12:00-12:20	Towards a Comprehensive Visual Quality Inspection for Industry 4.0 *Rožanec, Jože Martin, Zajec, Patrik, Trajkova, Elena, Šircelj, Beno, Brecelj, Bor, Novalija, Inna, Dam, Paulien, Fortuna, Blaž, Mladenić, Dunja*

RS01-Transportation

Wed. 11:00–12:40
Room B

11:00-11:20	Routing Decisions of a Hybrid Vehicle on Electric Road Networks *Gutierrez-Alcoba, Alejandro, Rossi, Roberto, Martin Barragan, Belen, Embley, Tim*
11:20-11:40	Solving Large Scale Vehicle Routing Problems with Hard Time Windows under Travel Time Uncertainty *Haripriya, K, Ganesan, Viswanath Kumar*
11:40-12:00	Distributed Data-Driven Control of Transportation Networks *Toro, Vladimir, Mojica-Nava, Eduardo, Rakoto-Ravalontsalama, Naly*
12:00-12:20	Tour Scheduling in Attended Home Delivery *Perroux, Tom, Lehuédé, Fabien, Restrepo, María I.*
12:20-12:40	Conceptual Framework for Assessing Sustainability of Urban Freight Transport *Ayadi, Hana, Hamani, Nadia, Benaissa, Mounir, Kermad, Lyes*

RS03-Inventory Control, Production Planning and Scheduling - 1

Wed. 11:00–12:40
Room C

11:00-11:20	Demand Driven MRP with Supplier Selection *Achergui, Abdelhalim, Allaoui, Hamid, Hsu, Tienté*
11:20-11:40	A Simulation-Optimization Approach to Parameterize Demand-Driven Material Requirements Planning *Damand, David, Lahrichi, Youssef, Barth, Marc*
11:40-12:00	Echelon Base Stock Policy for Symbiotic and Reverse Logistic Flows *Hennequin, Sophie, Yazdani, Mohamad Amin, Roy, Daniel*
12:00-12:20	Multi-Objective Production Planning of New and Remanufactured Products in Hybrid Production System *Lahmar, Houria, Dahane, Mohammed, Mouss, Nadia Kinza, Haoues, Mohammed*

Supply Chain 4.0 and Machine Learning

Wed. 11:00–12:40
Room D

11:00-11:20	Social Computational Design Method for Generating Product Shapes with GAN and Transformer Models *Yang, Maolin, Zang, Tianshuo, Jiang, Pingyu*
11:20-11:40	A Review Paper on Low Light Image Enhancement Methods for Un-Uniform Illumination *Mishra, Ashish Kumar, Panda, Chandra Sekhar*
11:40-12:00	Extension of the CCMS 2.0 Maturity Model towards Artificial Intelligence *Nick, Gábor András, Kő, Andrea, Szaller, Ádám, Zeleny, Klaudia Éva, Kadar, Botond, Kovacs, Tibor*
12:00-12:20	Machine Learning Framework for Predicting Online Purchase Intention of College Going Young Adults *Behera, Manoj Kumar, Pattnaik, Monalisha*
12:20-12:40	Towards a Blockchain-Based Smart Farm Agricultural Revolution in Sub-Saharan Africa *Andeme Bikoro, Doriane Micaela*

Wednesday, 14:00-15:40 – Parallel sessions II

Lean and Six Sigma in Services Healthcare - 2

Wed. 14:00–15:40
Room G

13:40-14:00	Optimizing Care of Visually Impaired People in the UPAS from the Perspective of Lean Healthcare *De Souza Ramos, José Ricardo, Calado, Robisom, Fausto, Ilma, Pinto, Sergio Crespo Coelho Da Silva, Teixeira, Adriana Melo, Braz, Ruth Maria Mariani*
14:20-14:40	DMAIC in Improving Patient Care Processes: Replication and Lessons Learned in Context of Healthcare *Reis, Milena Estanislau Diniz Mansur dos, Abreu, Melissa, Braga Neto, Olavo, Viera, Luis Enrique, Torres, Luis Fernando, Calado, Robisom*
14:40-15:00	Relevance of Fast-Track to Manage Overcrowding in Emergency Departments *Viera, Luis Enrique, Amaral Chaves, Sandra Maria do, Reis, Milena Estanislau Diniz Mansur dos, Calado, Robisom, Bourguignon, Saulo Cabral, Narciso Pereira, Newton*
15:00-15:20	Monitoring Patient Flow in the One Emergency Care Unit (UPA) in São Paulo Brazil *Narciso Pereira, Newton, Fonseca, Patrick Fernandes Ribeiro, Viera, Luis Enrique, Lessa Queiroz, Thaís, Calado, Robisom*
15:20-15:40	Clustering Brazilian Public Emergency Healthcare Units *Gomes Costa, Helder, Da Silva Gomes, Maria Helena Teixeira, Bonamigo, Andrei, Nascimento Santos, Gabriel, Calado, Robisom*

Decision Analytics and Digitization for End-To-End Supply Chain Transformation - 2

Wed. 14:00–35:40
Room H

13:40-14:00	Prediction of Turn Around Time Using Neural Networks - a Case Study of Shipping Ports *Balamwar, Anshul, De, Tuhin Subhra, Das, Debabrata, Tiwari, Manoj K*
14:20-14:40	Demand Forecasting of a Multinational Retail Company Using Deep Learning Frameworks *Saha, Priyam, Gudheniya, Nitesh, Mitra, Rony, Das, Dyutimoy, Narayana, Sushmita, Tiwari, Manoj K*
14:40-15:00	AI-Powered Cyberinfrastructure Platform for Modular Electric Vehicle Product Design: Conceptual Framework and Architecture *Sharma, Ajit, Keshari, Anupam, Swadhin, Snehal, Gokhale, Ravindra S., Tiwari, Manoj K*
15:00-15:20	Fraud Detection in Supply Chain with Machine Learning *Seify, Mahdi, Sepehri, Mehran, Darvish, Ariana, HosseinianFar, Amin*

15:20-15:40	Demand Forecasting in Hospital and ICUs Using a Modified Propagation Dynamic Model: A Novel GSEIR Approach *Trardi, Youssef, Al-Kharaz, Mohammed, Ananou, Bouchra, Ouladsine, Mustapha*

Intelligent Methods and Tools Supporting Decision Making in Manufacturing Systems and Supply Chains - 2

Wed. 14:00–15:40
Room I

13:40-14:00	Reactive Production Scheduling Approach Based on Inventory Availability *Takeda-Berger, Satie Ledoux, Agostino, Icaro, Flores da Silva, Maurício Randolfo, Frazzon, Enzo Morosini*
14:20-14:40	Adaptive Simulation-Based Optimization for Production Scheduling: A Comparative Study *Quadras, Djonathan, Frazzon, Enzo Morosini, Mendes, Lúcio Galvão, Pires, Matheus Cardoso, Carlos, Taboada*
14:40-15:00	Towards a Priority Rule to Integrate Maintenance Operations into Production Schedules *Broda, Eike, Freitag, Michael*
15:00-15:20	Lean and Resilience in Healthcare Supply Chain: A Mediation Analysis *Najla, Najla, Tortorella, Guilherme*
15:20-15:40	Visibility Model for Enhancing Supplychains Resilience *Viel de Farias, Ingra, Alvim, Silvio Luiz, de Simas, Davi, Frazzon, Enzo Morosini*

Assembly Line Balancing and Scheduling Problems - 2

Wed. 14:00–15:40
Room J

13:40-14:00	An Exact Solution Approach to the Type-II Transfer Line Balancing Problem *Telemeci, Yasin Ersin, Azizoglu, Meral*
14:20-14:40	Mixed-Integer Programming Model for Robotic Assembly Line Balancing Considering Cross-Station Task and Carbon Footprint *Li, Yuchen, Qiao, Zhaoxuan, Li, Mingyu, Zou, Yang*
14:40-15:00	Buffer Allocation vs. Sequencing Optimization: Which of the Two Is Most Effective to Improve the Efficiency of Assembly Lines? *Tiacci, Lorenzo*
15:00-15:20	A Disassembly Line Balancing Problem with Hazardous Task Failures *Goksoy Kalaycilar, Eda, Batun, Sakine, Azizoglu, Meral*
15:20-15:40	System Reconfiguration for Reverse Logistics: A Case Study *Omatseye, Oritsegbubemi, Urbanic, Ruth Jill*

City Logistics in the Age of Sustainability and Sharing Economy - 2

Wed. 14:00–15:40
Room KL

13:40-14:00	Social-Economic Sustainable Vehicle Routing Problem for Local E-Commerce Platforms *Pilati, Francesco, Tronconi, Riccardo*
14:20-14:40	The Global Semiconductor Chip Shortage: Causes, Implications, and Potential Remedies *Mohammad, Wassen, Elomri, Adel, Kerbache, Laoucine*
14:40-15:00	Prescriptive Cost Analysis in Manufacturing Systems *Silva, Sergio, Vyas, Vishad, Afonso, Paulo, Bret, Boris*
15:00-15:20	Sharing Economy: A Systematic Review of Definitions, Drivers, Applications, Industry Status and Business Models *Haqqani, Ahmed Abdul Hadi, Elomri, Adel, Kerbache, Laoucine*

Human-Centered Production and Logistics Systems of the Future - 2

Wed. 14:00–15:40
Room M

13:40-14:00	Cross-Skilled Workforce Allocation Supporting Self-Management Practices *Rotondo, Anna, Quilligan, Fergus, Barake, Mousbah*
14:20-14:40	Evaluating Robot Bin-Picking Performance Based on Box and Blocks Test *Bencak, Primož, Hercog, Darko, Lerher, Tone*
14:40-15:00	Golden Zone Storage Assignment and Picking Performance: An Empirical Analysis of Manual Picker-To-Parts Order Picking Systems in Grocery Retailing *Loske, Dominic, Koreis, Jonas, Klumpp, Matthias*
15:00-15:20	An Optimisation Model for Minimising Totes Exchange in VLM and SBS/RS Integrated System *Marolt, Jakob, Dukic, Goran, Sgarbossa, Fabio, Lerher, Tone*

Hybrid Approaches for Production Planning and Scheduling - 1

Wed. 14:00–15:40
Room N

13:40-14:00	Multi-Product Capacitated Disassembly Lot-Sizing Problem with Lost Sales and Possibility of Defective Disassembly Components *Hrouga, Mustapha, Sbihi, Abdelkader*
14:20-14:40	Simulation Study of Scheduling Heuristics for Parallel Machines with Sequence-Independent Setups *Xanthopoulos, Alexandros, Koulouriotis, Dimitrios*
14:40-15:00	A Hybrid Simulation/optimization Architecture for Developing a Digital Twin *Tissot, Geoffrey, Alpan, Gülgün, Mangione, Fabien, Noël, Frédéric*
15:00-15:20	Sim-Optimization Hybrid Approach for Scheduling Randomly Deteriorating Treatment Tasks in Horticulture *Mazar, Merouane, Bettayeb, Belgacem, Klement, Nathalie, Sahnoun, M'hammed, Louis, Anne*

Data-Driven Manufacturing Decision Making - 2

Wed. 14:00–15:40
Room B317

13:40-14:00	Reinforcement Learning and Digital Twin-Based Real-Time Scheduling Method in Intelligent Manufacturing Systems *Zhang, Lixiang, Hu, Yaoguang, Ren, Weibo*
14:20-14:40	Human Intention and Workspace Recognition for Collaborative Assembly *Gajjar, Nishant Ketan, Rekik, Khansa, Kanso, Ali, Müller, Rainer*
14:40-15:00	Decision Modeling for an ISA-95 Based Production Ontology *Sohr, Annelie, Listl, Franz Georg, Ecker, Katharina, Fischer, Jan, Wehrstedt, Jan Christoph, Weyrich, Michael*
15:00-15:20	Lessons Learn on Responsible AI Implementation: The ASSISTANT Use Case *Vyhmeister, Eduardo, Buchholz, Johan, Ostberg, P.-O., Gonzalez-Castañé, Gabriel*
15:20-15:40	Multi-Partners Digital Project Twin: A Tool for Project Monitoring *Barhebwa-Mushamuka, Felicien, Wagner, Sarah*

RS12-Inventory Control, Production Planning and Scheduling - 2

Wed. 14:00–15:40
Room B319

13:40-14:00	Installment Payment Strategy for Online Retailer Platform under Commercial Loan Financing *Wu, Xiaoli, Zeng, Yaoyi, Huang, Jingyi*
14:20-14:40	Retailer's Optimal Ordering and Financing Policies under Two-Level Credit Ratings *Wu, Xiaoli, Yang, Haixin*
14:40-15:00	Game between the Third Party Payment Service Provider and Bank in Mobile Payment Market *Jiang, Hui, Ma, Junhai*

RS19-Mecanique, Control - 2

Wed. 14:00–15:40
Room B320

13:40-14:00	Conoscopic Holography Feasibility for Form Error In-Situ Monitoring in Additive Manufacturing *Peña, Fernando, Fernández Suárez, Alejandro, Zapico, Pablo, Valiño, Gonzalo, Rico, Carlos*
14:20-14:40	A Framework for Integration of Resource Allocation and Reworking Concept into Design Optimisation Problem *Khezri, Amir Hossein, Homri, Lazhar, Etienne, Alain, Dantan, Jean-yves, Lanza, Gisela*
14:40-15:00	Enhancement of Compressive Strength for ABS Components Fabricated with Open-Source 3D Printing Process *Mohammed, Arshad, Chowdary, Boppana V.*
15:00-15:20	Analysis of the Impact of Servitization, Service Design and Digitalization in Industrial Companies: An Exploratory Approach *Alves, Cátia, Ferreira, Luis Miguel D., Melo Magalhães, Vanessa Sofia*
15:20-15:40	Knowledge Management in SMEs: Preliminary Ideas for a Dedicated Framework *Sima, Xingyu, Coudert, Thierry, Geneste, Laurent, De Valroger, Aymeric*

Efficient Routing: Models, Algorithms, Performance Evaluation an Practical Applications

Wed. 14:00–15:40
Room B

13:40-14:00	A Problem-Specific Branch-And-Bound Algorithm for the Protected Shortest Simple Path Problem with Must-Pass Nodes *Ogorodnikov, Yuri, Rudakov, Roman, Khachai, Daniil, Khachay, Michael*
14:20-14:40	Using PCGTSP Algorithm for Solving Generalized Segment Continuous Cutting Problem *Petunin, Alexander, Khachay, Michael, Ukolov, Stanislav, Chentsov, Pavel*
14:40-15:00	Experimental Evaluation of Algorithms for Packet Routing in Software Defined Network *Borisovsky, Pavel, Eremeev, Anton, Sergei, Hrushev, Teplyakov, Vadim*
15:00-15:20	Mathematical Model of the Nuclear Fuel Refueling Mechanism of the BN-800 Reactor and Optimization of Its Operation *Dolgii, Yurii F., Sesekin, Alexander, Tashlykov, Oleg*
15:20-15:40	Simulating Thermal Sheet Cutting of Figured Parts *Verkhoturov, Mikhail, Petunin, Alexander, Verkhoturova, Galina, Zaripov, Danil*

RS03-Inventory Control, Production Planning and Scheduling - 2

Wed. 14:00–15:40
Room C

13:40-14:00	Materials Flow Control in Multi-Cell Manufacturing Systems: The C-CONWIP System *Carmo-Silva, Sílvio, Thürer, Matthias, Gómez, Fernando J., Godinho Filho, Moacir, Fernandes, Nuno O.*
14:20-14:40	Improving Time Series Features Identification by Means of Convolutional Neural Networks and Recurrence Plot *Strozzi, Fernanda, Pozzi, Rossella*
14:40-15:00	Demand Forecasting for Delivery Platforms by Using Neural Network *Abbate, Raffaele, Manco, Pasquale, Caterino, Mario, Fera, Marcello, Macchiaroli, Roberto*
15:00-15:20	Inventory Management Model for Stockout Based Substitutable Products *Koren, Michal, Perlman, Yael, Shnaiderman, Matan*

RS11-Smart Manufacturing Systems

Wed. 14:00–15:40
Room D

13:40-14:00	Automatic State Matching Gaussian Process Ensemble for Wood Planer Control *Sexton, Jean-Thomas, Morin, Michael, Georges, Rémi, Abasian, Foroogh, Gaudreault, Jonathan*
14:20-14:40	A Learning Factory Framework : Challenges and Solutions for an Irish University *Quinn, William, Cionca, Victor, Witheephanich, Kritchai, Ozturk, Cemalettin*
14:40-15:00	Grid-Responsive Smart Manufacturing: Can the Manufacturing Sector Help Incorporate Renewables? *Chen, Yunzhi, Billings, Blake, Partridge, Sammy, Pruneau, Brittany, Powell, Kody*
15:00-15:20	Cloud Manufacturing - an Overview of Developments in Critical Areas, Prototypes, and Future Perspectives *Jacob, Into, Lu, Yuqian, Xu, Xun*
15:20-15:40	WiseDrive: A Driver Monitoring and Crash Prediction System *Elamrani Abou Elassad, Zouhair, Mousannif, Hajar, Ameksa, Mohammed*

Wednesday, 17:00-18:40 – Parallel sessions III

Lean and Six Sigma in Services Healthcare - 3

Wed. 17:00–18:40
Room G

17:00-17:20	Patient Scheduling: The Case of an Iranian Cardiology Clinic *Samarghandi, Hamed, Behroozi, Mehdi*
17:20-17:40	Correlation Analysis of Factors Impacting Health Product Consumption in French Hospitals *Koala, Denis, Yahouni, Zakaria, Alpan, Gülgün, Si Mohand, Djamal*
17:40-18:00	Multidimensional Assignment Problem in the Medical Sector: A Case Study *Tran, Quoc Nhat Han, Nguyen, Nhan-Quy, Amodeo, Lionel, Yalaoui, Farouk, Chehade, Hicham*
18:00-18:20	Potential of Continuing Education in Health of Improvement Practices in Urgencies and Emergencies in Emergency Care Units – UPAs-24H *Lima, Adalberto, Lima Barbosa, Christiane, Amaral Chaves, Sandra Maria do, Jackson Gonçalves Oliveira, Jackson, Lessa Queiroz, Thaís, Calado, Robisom*

18:20-18:40	Lean Healthcare Applied Systematically in the Accommodation of Medical Clinic's Beds in a Medium-Sized Hospital *Drei, Samuel Martins, Ignácio, Paulo Sérgio de Arruda*	

Decision Analytics and Digitization for End-To-End Supply Chain Transformation - 3

Wed. 17:00–18:40
Room H

17:00-17:20	Prediction and Analysis of Seasonal Dynamic Metal Consumption Using Aggregated LightGBM - a Case Study *Balamwar, Arjun, Mitra, Rony, Tiwari, Manoj K, Verma, Priyanka*	
17:20-17:40	Delay Prediction to Mitigate E-Commerce Supplier Disruptions Using Voting Mechanism *Wani, Duhita, Singh, Ritik, Khanapuri, Vivekanand B., Tiwari, Manoj K*	
17:40-18:00	Advancements in Air Cargo Logistics Financing Using a Consortium Blockchain *Yadav, Prajwal, Bhosale, Ratnesh, Sahoo, Rosalin, Khanzode, Vivek, Tiwari, Manoj K*	
18:00-18:20	Designing the Drone Based End-To-End Local Supply Chain Distribution Network *Juned, Mohd, Sangle, Purnima, Gudheniya, Nitesh, Haldankar, Pratik, Tiwari, Manoj K*	
18:20-18:40	Moving Average Smoothing for Gregory-Newton Interpolation: A Novel Approach for Short-Term Demand Forecasting *Mohammed, Ayman, Hassan, Syed Kumail, Abdel-Aal, Mohammad*	

Intelligent Methods and Tools Supporting Decision Making in Manufacturing Systems and Supply Chains - 3

Wed. 17:00–18:40
Room I

17:00-17:20	Data-Driven Decision Process for Robust Scheduling of Remanufacturing Systems *Schlecht, Michael, Himmiche, Sara, Goepp, Virginie, De Guio, Roland, Köbler, Jürgen*	
17:20-17:40	Digital Continuity to Improve the Performance of the Industry 4.0 *Chapelin, Julien, Voisin, Alexandre, Iung, Benoît, Rose, Bertrand*	
17:40-18:00	Efficiency Comparison of Proactive Approaches to Deal with Machine Failures *Alves, Fernanda de Freitas, Ravetti, Martin G.*	
18:00-18:20	Streamline 3D Simulation Model Development for Virtual Commissioning with IEC61499 *Rovere, Diego, Silvestri, Marco, Dal Maso, Giovanni, Dzafic, Hilmo, Pedrazzoli, Paolo*	
18:20-18:40	Determine the Efficiency Frontier of a Manufacturing Factory through a Data-Driven Approach *Bosi, Andrea, Grizzetti, Alessandro, Silvestri, Marco, Villanueva, Caroline*	

Recent Advances in Sustainable Manufacturing

Wed. 17:00–18:40
Room J

17:00-17:20	A Comparative Study of Three NSGA Versions for the Multi-Objective Sustainable Process Plans Optimization in RMS *Khettabi, Imen, Benyoucef, Lyes, Boutiche, Mohamed*	
17:20-17:40	Sustainable Integrated Process Planning and Scheduling (IPPS) in RMS: Past, Present and Future *Zhang, Zeren, Benyoucef, Lyes, Siadat, Ali*	
17:40-18:00	Facility Layout Design through Integration of Lean Manufacturing in Industry 4.0 Context *Chakroun, Ayoub, Zribi, Heni, Hani, Yasmina, El Mhamedi, Abderrahman, Masmoudi, Faouzi*	
18:00-18:20	Sustainable Value Creation of Networked Manufacturing Enterprises: Big Data Analytics Based Methodology *Tamym, Lahcen, Benyoucef, Lyes, Nait-Sidi-Moh, Ahmed, El Ouadghiri, Moulay Driss*	
18:20-18:40	Circular Transformation Pathways in the Manufacturing Industry: A Systematic Literature Review *Mauss, Niclas-Alexander, Thiemt, Florian, Fottner, Johannes*	

City Logistics in the Age of Sustainability and Sharing Economy - 3

Wed. 17:00–18:40
Room KL

17:00-17:20	Competitive Optimal Pricing of O2O On-Demand Platform with Multihoming Delivery Riders *Wang, Wenjie, Jiang, Li, Xie, Lei*	
17:20-17:40	Bridging the Parcel Delivery Last Mile Gap in Qatar: Challenges and Enhancements *Jamous, Rana, Kerbache, Laoucine, Elomri, Adel*	
17:40-18:00	Domestic Waste Management with Io-Enabled Applications: A Case Study of the Al Rayyan, Qatar Region *Hussain, Iftikhar, Elomri, Adel, Kerbache, Laoucine*	

18:00-18:20	Sustainable Container Distribution by Alternatively Fueled Vehicles under Customer and Technical Constraints *Tekil-Ergün, Sezgi, Pesch, Erwin, Kuźmicz, Katarzyna*

Human-Centered Production and Logistics Systems of the Future - 3

Wed. 17:00–18:40
Room M

17:00-17:20	Comparing Linear and Non-Linear Modeling Approaches of Learning Effects in 2-Stage Flowshop Scheduling Problems *Paredes-Astudillo, Yenny Alexandra, Botta-Genoulaz, Valérie, Montoya-Torres, Jairo R.*
17:20-17:40	Disabled Employees on the Manufacturing Line: Simulations of Impact on Performance and Benefits for Companies *Litwin, Paweł, Antonelli, Dario, Stadnicka, Dorota*
17:40-18:00	Reciprocal Learning in Production and Logistics *Nixdorf, Steffen, Zhang, Minqi, Grosse, Eric, Ansari, Fazel*
18:00-18:20	Aircraft Final Assembly Line Planning with Staircase Makespan and Equity Criteria *Lovato, Damien, Guillaume, Romain, Thierry, Caroline, Battaïa, Olga*

Hybrid Approaches for Production Planning and Scheduling - 2

Wed. 17:00–18:40
Room N

17:00-17:20	The Product-Mold-Machine Manufacturing Problem *Piñeyro, Pedro, Cancela, Héctor, Troncoso, Nelson, Quezada, Franco, Óscar C., Vásquez*
17:20-17:40	Integrated Tactical Production Planning with Multi Transportation Modes and Multi Supply Sources: The Case of a Phosphate Company *Azzamouri, Bassma, Hovelaque, Vincent, Giard, Vincent*
17:40-18:00	Advanced Process Control Modeling from an Advanced Planning and Scheduling Perspective *Kelly, Jeffrey, Menezes, Brenno*
18:00-18:20	Analysis of Production Systems with Variable Transfer Batch Size *Rabta, Boualem*

Data-Driven Methods for Supply Chain Optimization

Wed. 17:00–18:40
Room B317

17:00-17:20	Concurrent WIP and an Application to Clearing Functions for Complex Heterogenous Systems *Lemaire, Pierre, Dequeant, Kean, Espinouse, Marie-Laure, Vialletelle, Philippe*
17:20-17:40	Hermit Crab Optimizer (HCO): A Novel Meta-Heuristic Algorithm *Tafakkori, Keivan, Tavakkoli-Moghaddam, Reza*
17:40-18:00	An Analogic Supply Chain Twin *D'Urso, Diego, Chiacchio, Ferdinando, Khodayee, Soheyl Moheb, Compagno, Lucio*
18:00-18:20	Data-Driven Analysis on Anticipatory Shipping for Pickup Point Inventory *Xinxin, Ren, Gong, Yeming, Rekik, Yacine, Xianhao, Xu*
18:20-18:40	Improving the Tractability of SVC-Based Robust Optimization *Loger, Benoit, Dolgui, Alexandre, Lehuédé, Fabien, Massonnet, Guillaume*

Remanufacturing for Circularity Concern

Wed. 17:00–18:40
Room B319

17:00-17:20	Towards Intelligent Manufacturing System Safety Strategies: Generating LockOut/TagOut Sheets by Machine Learning – a Case Study *Delpla, Victor, Kevin Chapron, Kevin Chapron, Kenne, Jean-Pierre, Hof, Lucas*
17:20-17:40	Modelling and Analysis of a Markovian Production-Inventory Network *Vlastos, Spyros, Xanthopoulos, Alexandros, Koulouriotis, Dimitrios*
17:40-18:00	A Sustainability-Based Model for Robotic Disassembly Sequence Planning in Remanufacturing Using the Bees Algorithm *Hartono, Natalia, Ramirez, F Javier, Pham, Duc*
18:00-18:20	EPQ Model for Hybrid Manufacturing / Remanufacturing Systems with Price Sensitive Demands *Godichaud, Matthieu, Amodeo, Lionel*
18:20-18:40	A Cloud-Aided Remanufacturing Framework to Assess the Relative Complexity *Mancusi, Francesco, Fruggiero, Fabio, Panagou, Sotirios*

Operators 4.0 and Human-Technology Integration in Smart Manufacturing and Logistics Environment

Wed. 17:00–18:40
Room B320

17:00-17:20	Augmented Reality in Logistics 4.0: Implications for the Human Work *Lagorio, Alexandra, Di Pasquale, Valentina, Cimini, Chiara, Miranda, Salvatore, Pinto, Roberto*
17:20-17:40	Development of a Multi-Agent System to Tackle Communication Fragmentation and Information Exchange in the Construction Industry *Perera, Hasitha, Azadnia, Amir Hossein, Ghadimi, Pezhman*
17:40-18:00	Wearable Devices for Health and Safety in Production Systems: A Literature Review *Di Pasquale, Valentina, De Simone, Valentina, Radano, Martina, Miranda, Salvatore*
18:00-18:20	Agent's Motor Performance: An Index of Difficulty-Based Model *Lucchese, Andrea, Mummolo, Giovanni, Digiesi, Salvatore, Mummolo, Carlotta*
18:20-18:40	Modular Reconfiguration of Flexible Production Systems Using Machine Learning and Performance Estimates *Scrimieri, Daniele, Adalat, Omar, Afazov, Shukri, Ratchev, Svetan*

Challenges for Modelling, Management and Control in Silver Economy

Wed. 17:00–18:40
Room B

17:00-17:20	The Framework for Research of Transitions among Different Care Settings in Smart Lifetime Neighbourhood *Rogelj, Valerija, Temeljotov Salaj, Alenka*
17:20-17:40	Capacity Planning for Social Infrastructure of Smart Lifetime Neighbourhoods: Social Value Approach *Bogataj, Marija, Drobez, Eneja, Rogelj, Valerija, Drobez, Miso, Bogataj, David*
17:40-18:00	Smart Age-Friendly Villages: Literature Review and Research Agenda *Dokl, Dejan, Rogelj, Valerija, Bogataj, David*
18:00-18:20	Ambient Intelligence Supporting Health and Social Care Services in Smart Care Settings: Literature Review and Research Agenda *Drobez, Eneja, Kavsek, Marta, Bogataj, Marija, Drobez, Miso*
18:20-18:40	The Use of Information and Communication Technologies Affects Mental Health and Quality of Life of Older Adults During the COVID-19 Pandemic6 *Nedeljko, Mihael, Bogataj, David, Toplak Perovič, Barbara, Kaučič, Boris Miha*

RS09-Production Planning and Scheduling

Wed. 17:00–18:40
Room C

17:00-17:20	Customer Order Scheduling in a Mobile 3D Printing Factory *Alarcon-Gerbier, Eduardo, Zipfel, Benedikt, Buscher, Udo*
17:20-17:40	Mixed Integer Linear Programming Model for Open Pit Mine Scheduling *Tchernev, Nikolay, Azzamouri Ahlam, Aallaoui, Soufiane*
17:40-18:00	Continuous Time and Volume Batch Formulation for the Multiproduct Pipeline Network Scheduling Problem *Tchernev, Nikolay, Ren, Libo, Meryem, Bamoumen, Elfirdoussi, Selwa*
18:00-18:20	Threat Elimination Algorithm for Dual Resource Constrained Flexible Job Shop Scheduling Problems *Magalhães, Ricardo Miguel, Vieira, Susana M., Sousa, Joao M. C.*

Integration of Unmanned Aerial Vehicles to the Management and Control of Manufacturing Systems

Wed. 17:00–18:40
Room D

17:00-17:20	A Feasibility Study on Unmanned Aerial Vehicle Navigation and Docking for Materials Transportation in Manufacturing Systems *Vosniakos, George Christopher, Maltezos, Gerasimos*
17:20-17:40	An Augmented Reality Tool for the Facilitation of an UAV Flight Inspection Process During Aircraft De-Icing As a Maintenance Procedure *Stavropoulos, Panagiotis, Athanasopoulou, Lydia, Papacharalampopoulos, Alexios, Kanellopoulos, Ioannis, Mourtzis, Dimitris*
17:40-18:00	Unmanned Aerial Vehicle (UAV) Manipulation Assisted by Augmented Reality (AR): The Case of a Drone *Mourtzis, Dimitris, Angelopoulos, John, Panopoulos, Nikos*
18:00-18:20	On the Mechanical Design of a Customized Unmanned Aerial Vehicle Transporter for Flexible Manufacturing Systems *Vosniakos, George Christopher, Lekai, Efthymios, Maltezos, Gerasimos*
18:20-18:40	Case Study on the Use of Unmanned Aerial Vehicles for the Maintenance of Ocean Engineering Facilities *Deja, Mariusz, Gerigk, Mirosław, Siemiatkowski, Mieczyslaw*

Thursday, 8:15-9:55 – Parallel sessions IV

Emerging Modeling Methods and Algorithms in Health Management with Uncertainties - 1

Thu. 08:15–09:55
Room G

08:15-08:35	Multi-Objective Emergency Supply Planning: A Case Study on Sichuan Province of China *Zhuo, Maolin, Yang, Wenjie*
08:35-08:55	Predicting Relative Risk of Antimicrobial Resistance Using Machine Learning Methods *Wu, Ying, Jiang, Peng, Goh, Shin Giek, Yu, Kaifeng, Chen, Yihan, He, Yiliang, Gin, Karina Y.H.*
08:55-09:15	Redesigning Deployments of Community Hospitals with a Location-Allocation Model *Zhuo, Maolin, Li, Jiacheng, Zhang, Renshan*
09:15-09:35	Improving the Availability of Australian Hospitals' Critical Medical Devices *Berrell, Robert, Chakrabortty, Ripon*

Special Session Dedicated to the Memory of Dr. Jean-Marie Proth - 1

Thu. 08:15–09:55
Room H

08:15-08:35	Bi-Objective Optimization for an Integrated Facility Location and Disassembly Line Balancing Problem *Hu, Peng, Chu, Feng*
08:35-08:55	On Local Optima Distribution in Buffer Allocation Problem for Production Line with Unreliable Machines *Dolgui, Alexandre, Eremeev, Anton, Sigaev, Viatcheslav*
08:55-09:15	An Integrated Approach to Line Balancing for a Robotic Production System with the Unlimited Availability of Human Resources *Yu, Haiyan, Can, Niu, Wang, Yongxing, Wang, Shengze, Ogbeyemi, Akinola, Zhang, Wenjun*
09:15-09:35	Research in Production Systems and Management: "How To" and Lessons *Nagi, Rakesh*

Industry 4.0 and Sustainability: Applications and Research about Environmental, Social and Economic Benefits from the Fourth Industrial Revolution - 1

Thu. 08:15–09:55
Room I

08:15-08:35	A Systemic Analysis of the Impacts of Product 4.0 on the Triple Bottom-Line of Sustainability *Popolo, Valentina, Vespoli, Silvestro, Gallo, Mosè, Grassi, Andrea*
08:35-08:55	A Stochastic Costing Model for Manufacturing Management and Control *Vyas, Vishad, Afonso, Paulo, Silva, Sergio, Bret, Boris*
08:55-09:15	A Milk-Run Routing and Scheduling Model for a Smart Manufacturing System *Facchini, Francesco, Mossa, Giorgio, De Tullio, Simona*
09:15-09:35	Implementation of a Remote Control and System Monitoring Via a Digital Twin on an Industrial Pilot Plant *Tancredi, Giovanni Paolo Carlo, Vignali, Giuseppe, Bottani, Eleonora*
09:35-09:55	Consumer Environmental Awareness and Privatization *Perlman, Yael, Caspi, Hilla*

Challenges and Opportunities in Applying Additive Manufacturing in Supply Chains - 1

Thu. 08:15–09:55
Room J

08:15-08:35	Additive or Conventional Manufacturing for Spare Parts: Effect of Failure Rate Uncertainty on the Sourcing Option Decision *Peron, Mirco, Basten, Rob, Knofius, Nils, Lolli, Francesco, Sgarbossa, Fabio*
08:35-08:55	On the Suitability of Insourced Additive Manufacturing for Spare Parts Management *Lolli, Francesco, Coruzzolo, Antonio, Peron, Mirco, Sgarbossa, Fabio*
08:55-09:15	Challenges and Opportunities for Implementing Additive Manufacturing Supply Chains in Circular Economy *Hettiarachchi, Biman Darshana, Sudusinghe, Jayani Ishara, Seuring, Stefan, Brandenburg, Marcus*
09:15-09:35	Spare Parts Management with Additive Manufacturing (AM): A Critical Review *Coruzzolo, Antonio, Balugani, Elia, Gamberini, Rita*
09:35-09:55	Printing in the Army: Where to Locate Additive Manufacturing Capabilities in a Remote Spare Parts Supply Chain? *Zijlstra, Veronique, Basten, Rob, Julsing, Tim*

Artificial Intelligence and Data Science for Smart Decision Making in Manufacturing - 1

Thu. 08:15–09:55
Room KL

08:15-08:35	Case-Based Reasoning for Home Health Care Planning Considering Unexpected Events *Ben Hassen, Houyem, Tounsi, Jihene, Ben Bachouch, Rym, Elkosantini, Sabeur*
08:35-08:55	Source Printer Identification with Microscopic Printing Using Deep Learning *Phan Ho, Anh Thu, Nguyen, Quoc-Thông, Patrix, Jérémy, Verny, Jerome*
08:55-09:15	Explainable Anomaly Detection for Industrial Control System Cybersecurity *Do, Thu Ha, Nguyen, Xuan Hoang, Nguyen, Viet Hoang, Nguyen, Huu Du, Truong, Thu Huong, Tran, Kim Phuc*
09:15-09:35	System Configuration Models: Towards a Specialization Approach *Mohammadamini, Maryam, Coudert, Thierry, Vareilles, Elise, Aldanondo, Michel*
09:35-09:55	Enhanced CUSUM Control Charts for Monitoring Coefficient of Variation: A Case Study in Textile Industry *Tran, Phuong Hanh, Heuchenne, Cédric, Thomassey, Sébastien*

Advances in Reliability and Maintenance Modelling of Sustainable Manufacturing-Distribution Systems - 1

Thu. 08:15–09:55
Room M

08:15-08:35	Joint Preventive Maintenance and Extended Warranty Strategy for Leased Unreliable Equipment Submitted to Imperfect Repair at Failure *Ben Mabrouk, Amel, Chelbi, Anis*
08:35-08:55	A Novel Predictive Selective Maintenance Strategy Using Deep Learning and Mathematical Programming *O'Neil, Ryan Patrick, Diallo, Claver, Khatab, Abdelhakim*
08:55-09:15	Selective Maintenance Optimization: A Condensed Critical Review and Future Research Directions *Al-Jabouri, Hamzea, Saif, Ahmed, Khatab, Abdelhakim, Diallo, Claver, Venkatadri, Uday*
09:15-09:35	A Property-Based Genetic Algorithm for Order Acceptance and Scheduling with Common Due Window *Zhao, Ziye, Chen, Xiaohui, An, Youjun, Li, Yinghe*
09:35-09:55	Robust Job Shop Scheduling with Condition-Based Maintenance and Random Breakdowns *Ali, Md Hasan, Saif, Ahmed, Ghasemi, Alireza*

Data-Driven Management in Sustainable Supply Chains - 1

Thu. 08:15–09:55
Room B317

08:15-08:35	A Sustainable Product Design Approach Based on Data Mining of Dynamic User Demands: A Case Study on HUAWEI Mate 40 Series *Zou, Fanxing, Zhu, Xinyu, Qian, Yuning, Chang, Danni*
08:35-08:55	Forecasting the Amount of Recyclables Using an Improved Differential Evolution-Based Neural Network *Yang, Jin, Dong, Shuangshuang, Zhang, Haoran, Jiang, Peng, Liu, Xiao, Zheng, Meimei, Du, Ningxin*
08:55-09:15	Waste Electrical and Electronic Equipment Recycling with Capacity Constraints and Demand Forecast Updating *Du, Ningxin, Yang, Jin, Zheng, Meimei, Weng, Wei*
09:15-09:35	The Carbon Cost Influences Research on Supply Chain Network Design *Li, Bing, Song, Xiang, Wall, Graham, Liu, Xiao*
09:35-09:55	Optimizing the Supply of Essential Goods under Closed-Off Management: A Case Study of COVID-19 *Song, Zihao, Shou, Juping, Luo, Chunling*

Modelling and Control of Sustainable Production Taking into Account the System Reliability - 1

Thu. 08:15–09:55
Room B319

08:15-08:35	Two-Stage Stochastic Program for Disassembly Lot-Sizing under Random Ordering Lead Time *Slama, Ilhem, Ben-Ammar, Oussama, Garcia, David, Dolgui, Alexandre*
08:35-08:55	Integrated Production and Maintenance Scheduling with Environmental and Operational Considerations *Chekoubi, Zakaria, Ettahiry, Noura, Dellagi, Sofiene, Trabelsi, Wajdi, Majdouline, Ilias*
08:55-09:15	Fuzzy Models and Product's Quality Prediction in Converter Production *Pashchenko, Alexander*
09:15-09:35	Two-Echelon Inventory Management for Sustainable Pharmaceutical Supply Chain through Waste Reduction *Romdhani, Shayma, Nouaouri, Issam, Tounsi, Jihene, Gattoufi, Said, Allaoui, Hamid*
09:35-09:55	Machine Learning Approach for Integrated Maintenance and Spare Parts Management Strategies *Abderrahmane, Faker, Hajej, Zied, Dellagi, Sofiene, Bouslikhane, Salim*

Reconfigurable, Flexible or Agile Production Systems to Deal with a VUCA World - 1

Thu. 08:15–09:55
Room B

08:15-08:35	Integrated Lot-Sizing and Job Shop Scheduling Benefiting from Reconfigurable Machine Tools *Rohaninezhad, Mohammad, Hanzalek, Zdenek, Tavakkoli-Moghaddam, Reza, Vahedi-Nouri, Behdin*
08:35-08:55	A Bi-Objective Model for a Stage Shop Scheduling Problem with Human-Robot Collaboration *Ghasemkhani, Ahmad, Tavakkoli-Moghaddam, Reza, Hamid, Mahdi, Nasiri, Mohammad Mahdi*
08:55-09:15	Designing Reconfigurable Manufacturing Systems to Minimize Power Peak *Delorme, Xavier, Gianessi, Paolo*
09:15-09:35	A MILP-Based Heuristic Approach for the Design of Multi-Product Modular Reconfigurable Lines *Yelles-Chaouche, Abdelkrim R., Gurevsky, Evgeny, Brahimi, Nadjib, Dolgui, Alexandre*

Viable and Reconfigurable Supply Chains, Intertwined Supply Networks and Ecosystems - 1

Thu. 08:15–09:55
Room C

08:15-08:35	Can Anticipatory Supply Chain Decision Making Manage the Pandemic's Effect? a Regime Switching Game *Mukherjee, Arka, Ganguly, Anirban, Kumar, Chitresh, Chowdhury, Priyabrata*
08:35-08:55	Remanufacturing Strategies for a Closed-Loop Supply Chain Considering Brand Power and Carbon Regulation *Liu, Xiujuan, He, Yong, Ahsan, Ali*
08:55-09:15	Time-To-Recovery Prediction in a Disrupted Three-Echelon Supply Chain Using LSTM *Ashraf, Mahmoud, Eltawil, Amr, Ali, Islam*
09:15-09:35	A Flexible Closed Loop Supply Chain Design Considering Multi-Stage Manufacturing and Queuing Based Inventory Optimization *Jahani, Hamed, Hadi, Gholizadeh*
09:35-09:55	Combined Models and Algorithms on Modern Proactive Intellectual Scheduling under Industry 4.0 Environment *Sokolov, Boris, Zakharov, Valerii, Baranov, Anton*

RS18-Facility Planning and Materials Handling

Thu. 08:15–09:55
Room D

08:15-08:35	Storage Efficiency in a Deep-Lane AVS/RS *Battarra, Ilaria, Accorsi, Riccardo, Manzini, Riccardo, Rubini, Sara*
08:35-08:55	Integrated Production Inventory and Distribution Problem of Fertilizer Products with Additional Storage Constraints *BELIL sabah, Bendaoud, Tchernev, Nikolay, Kemmoe, Sylverin*
08:55-09:15	A Robust Design Integration in Non-Traditional Unit Load Warehouses *Rao, Subir, Roy, Sheila*
09:15-09:35	A New Measure for Scattering of Stocks in E-Commerce Warehouses *Pawar, Nilendra Singh, Rao, Subir, Adil, Gajendra K*

Green, Agile and Resilient Supply Chains and Manufacturing Systems

Thu. 08:15–09:55
Room E

08:15-08:35	Analysis of the Impact of Lean and Green Practices in Manufacturing Companies: An Exploratory Study *Ribeiro, Teresa, Ferreira, Luis Miguel D., Melo Magalhães, Vanessa Sofia, Azevedo, Susana*
08:35-08:55	Research Trends in Clean, Green and Sustainable Manufacturing: A Bibliometric Review *Caterino, Mario, Rinaldi, Marta, Fera, Marcello, Macchiaroli, Roberto, Bottani, Eleonora*
08:55-09:15	IFAC MIM 2022 Conference: How to Prepare Students for an Agile Professional Life *Stechert, Carsten, Balzerkiewitz, Hans-Patrick*
09:15-09:35	Development and Proposal of a LARG (lean, Agile, Resilient, Green) Performance Measurement System for a Food Supply Chain *Bottani, Eleonora, Bigliardi, Barbara, Rinaldi, Marta*
09:35-09:55	Assessing Lean, Green and Supply Chain's Sustainable Performance: Perspectives from Academia and Industry *Hebaz, Ali, Oulfarsi, Salah, Ait Hammou, Ikram, Sahib Eddine, Abdelhak*

Thursday, 11:00-12:40 – Parallel sessions V

Emerging Modeling Methods and Algorithms in Health Management with Uncertainties - 2

Thu. 11:00–12:40
Room G

11:00-11:20	A Rolling-Horizon Approach for a Surgery Case Scheduling Problem with Sterilizing Constraints *Al Hasan, Hasan, Guéret, Christelle, Lemoine, David, Rivreau, David*
11:20-11:40	A Review of Approaches in the Development of Risk Stratification Models for Diabetic Patients at Risk of Vascular Complications *Osop, Hamzah, Xu, Haiyan, Fu, Xiuju*
11:40-12:00	Multi-Objective Simulation-Based Optimization for Effective Management of the Outpatient Chemotherapy Process *Hadid, Majed, Elomri, Adel, Jouini, Oualid, Kerbache, Laoucine, Saleh, Ahmed, Hamad, Anas*
12:00-12:20	An Anomaly Detection Method for Metro Signal and Control Systems *Huang, Yibin, Li, Yat Hung, Pei, Cheng, Wang, Lei, Liu, Ming Wai, Cheung, Man Sing, Lau, Kwok Ming, Chan, Chin Pang, Ma, Zeya, Peng, Zhijin, Chen, Jingliang*
12:20-12:40	Conceptual Design of Intelligent Platform for Non-Invasive Thermal Discomfort Detection *Marchenko, Alla, Temeljotov Salaj, Alenka*

Special Session Dedicated to the Memory of Dr. Jean-Marie Proth - 2

Thu. 11:00–12:40
Room H

11:00-11:20	A General Robust Dynamic Bayesian Network Method for Supply Chain Disruption Risk Estimation under Ripple Effect *Liu, Ming, Lin, Tao, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
11:20-11:40	A Reinforcement Learning Variable Neighborhood Search for the Robust Dynamic Bayesian Network Optimization Problem under the Supply Chain Ripple Effect *Liu, Ming, Tang, Hao, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
11:40-12:00	Minimax Relative Regret Approach for Resilient Supply Chain Design *Liu, Ming, Ding, Yueyu, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
12:00-12:20	Forecast and Decision Horizons in a Commodity Trading Model *Sethi, Suresh P.*

Industry 4.0 and Sustainability: Applications and Research about Environmental, Social and Economic Benefits from the Fourth Industrial Revolution - 2

Thu. 11:00–12:40
Room I

11:00-11:20	Economic and Environmental Evaluations of Photovoltaic Installations for Self-Consumption in Industrial Energy Communities *Gribiss, Hamza, Aghelinejad, Mohammadmohsen, Yalaoui, Farouk*
11:20-11:40	An Overview on Olive Oil Waste Valorization Scenarios: Life Cycle Approach *Keskes, Mohamed Amir, Zouari, Alaeddine, Houssin, Rémy, Dhouib, Diala, Renaud, Jean*
11:40-12:00	Harmonizing ”Smart” Life Cycle Assessment in Manufacturing Companies: Literature Review and Preliminary Morphological Analysis *Miklautsch, Philipp, Hoffelner, Mario, Woschank, Manuel*
12:00-12:20	A Collaborative Architecture to Support Circular Economy through Digital Material Passports and Internet of Materials *Panza, Luigi, Bruno, Giulia, Lombardi, Franco*
12:20-12:40	The Environmental, Economic and Social Impact of Industry 4.0 in the Food Sector: A Descriptive Literature Review *Stefanini, Roberta, Vignali, Giuseppe*

Challenges and Opportunities in Applying Additive Manufacturing in Supply Chains - 2

Thu. 11:00–12:40
Room J

11:00-11:20	Comparing Additive Manufacturing Processes for Distributed Manufacturing *Salmi, Mika*
11:20-11:40	A Framework to Assess the Sustainability of Additive Manufacturing for Spare Parts *Butturi, Maria Angela, Marinelli, Simona, Lolli, Francesco*
11:40-12:00	Towards a Complex Geometry Manufacturing: A Case Study on Metal 3D Printing of Topology Optimised Bicycle Parts with Lattices *Tajudeen, Sulaymon Abiodun, Helo, Petri, Toshev, Rayko*
12:00-12:20	Mathematical Models for Minimizing Total Tardiness on Parallel Additive Manufacturing Machines *Yu, Chunlong, Matta, Andrea, Semeraro, Quirico, Lin, Junjie*

12:20-12:40	Intellectual Property Management Challenges of Additive Manufacturing in Replacement Part Supply Chains *Adu-Amankwa, Kwaku, Corney, Jonathan, Rentizelas, Athanasios, Wodehouse, Andrew*

Artificial Intelligence and Data Science for Smart Decision Making in Manufacturing - 2

Thu. 11:00–12:40
Room KL

11:00-11:20	Anomaly Detection for Compositional Data Using VSI MEWMA Control Chart *Nguyen, Thi Thuy Van, Heuchenne, Cédric, Tran, Kim Phuc*
11:20-11:40	Reinforcement Learning Provides a Flexible Approach for Realistic Supply Chain Safety Stock Optimisation *Kosasih, Edward, Brintrup, Alexandra*
11:40-12:00	An Experimental Study of Two Predictive Reinforcement Learning Methods and Comparison with Model-Predictive Control *Dobriborsci, Dmitrii, Osinenko, Pavel, Aumer, Wolfgang*
12:00-12:20	Optimising Turning Operation in Precision Manufacturing Using Fused IoT Devices and Machine Learning Approach *Olalere, Isaac Opeyemi, Olanrewaju, Oludolapo Adeyanju*
12:20-12:40	Forecasting Saturation in the Emergency Department: A Comparison of Queuing Data-Driven Approaches *Wartelle, Adrien, Mourad Chehade, Farah, Yalaoui, Farouk, Sanchez, Stéphane, Laplanche, David*

Advances in Reliability and Maintenance Modelling of Sustainable Manufacturing-Distribution Systems - 2

Thu. 11:00–12:40
Room M

11:00-11:20	A Remaining Useful Life Model for Optimizing Maintenance Cost and Spare-Parts Replacement of Production Systems in the Context of Sustainability *Ait-Kadi, Daoud, Rebaiaia, Mohamed-Larbi*
11:20-11:40	A New Integrated Strategy for Optimizing the Maintenance Cost of Production Systems Using Reliability Importance Measures *Rebaiaia, Mohamed-Larbi, Ait-Kadi, Daoud*
11:40-12:00	Development of a Flexible Predictive Maintenance System in the Context of Industry 4.0 *Ciancio, Vincent, Homri, Lazhar, Dantan, Jean-yves, Siadat, Ali*
12:00-12:20	Anomaly Detection Method of Aircraft System Using Multivariate Time Series Clustering and Classification Techniques *Ben Slimene, Mohamed, Ouali, Mohamed-Salah*
12:20-12:40	Maintenance Activities Optimization Via Modelling Dedicated to Manufacturing-Distribution Systems: Selected Case Studies Discussion *Salgado Duarte, Yorlandys, Szpytko, Janusz, Salgado Duarte, Yolainys*

Data-Driven Management in Sustainable Supply Chains - 2

Thu. 11:00–12:40
Room B317

11:00-11:20	A New Data-Driven Framework to Select the Optimal Replenishment Strategy in Complex Supply Chains *Corsini, Roberto Rosario, Costa, Antonio, Fichera, Sergio, Framinan, Jose M*
11:20-11:40	Causation Analysis for Bridge-Tunnel Hybrid Construction Accident Based on FISM-DEMATEL *Chen, Fangyu, Wu, Xing, Wei, Yongchang*
11:40-12:00	Data Quality Criteria for Urban Waste Management Policy-Making Using Environment-Based Design *Chen, Tianyu, Yang, Jiami, Du, Wenhang, Yao, Jinli, Yan, Jun, Ge, Hua, Bhuiyan, Nadia, Zhou, Fayi, Liu, Xiao, Zeng, Yong*
12:00-12:20	Data-Driven Dynamical Modeling of Dairy Production Oriented to Herd Management *Rodriguez-Obando, Diego Jair, Castro Rincón, Edwin, Castaño-Marín, Angela María, Montes-Vergara, José Carlos, Rosero, Nadia*
12:20-12:40	Predicting the Wood Mean Moisture Content in a Conventional Kiln-Based Drying Process: A Data-Driven Approach *Laaroussi, Mouhcine, Benabbou, Loubna, Ouhimmou, Mustapha, Abasian, Foroogh, Haddad, Samir*

Modelling and Control of Sustainable Production Taking into Account the System Reliability - 2

Thu. 11:00–12:40
Room B319

11:00-11:20	An Optimal Production, Maintenance and Quality Problem, with Improved Statistical Process Chart of a Supply Chain under Service and Quality Requirements *Abubakar, Aminu Sahabi, Hajej, Zied, Nyoungue, Aimé*
11:20-11:40	Optimization of Production Batches in a Circular Supply Chain under Uncertainty *Morjène, Yasmine, Ndhaief, Nadia, Rezg, Nidhal*

11:40-12:00	Pricing and Remanufacturing Decisions in a Dual Channel Reverse Supply Chain: Study of Three Configurations with after Sales Services *Hamzaoui, Ahmed Farouk, Turki, Sadok, Rezg, Nidhal*
12:00-12:20	Simulation and Optimisation of a Failure-Prone Disassembly-Reconditioning-Assembly System *Turki, Sadok, Ben-Ammar, Oussama, Slama, Ilhem, Rezg, Nidhal, Dolgui, Alexandre*
12:20-12:40	Optimal Management of Production, Maintenance, and Logistic Activities in Multi-Site Environments *Diaz, Kamar, Kammoun, Mohamed Ali, Hajej, Zied, Sefiani, Naoufal, Milazzo, Maria Francesca*

Reconfigurable, Flexible or Agile Production Systems to Deal with a VUCA World - 2

Thu. 11:00–12:40
Room B

11:00-11:20	A Simulated Annealing Approach for Optimizing Layout Design of Reconfigurable Manufacturing System Based on the Workstation Properties *Clarion, Jean-Baptiste, Francois, Julien, Grebennik, Igor, Dupas, Rémy*
11:20-11:40	Toward Scalability Evaluation of Multi-Model Lines *Delorme, Xavier, Cerqueus, Audrey*
11:40-12:00	Investigating Sustainable Manufacturing Practices in Relation to Manufacturing Strategy Context of a Firm *Pande, Bhavya, Adil, Gajendra K*
12:00-12:20	Serious Game As Learning Media for Reconfigurable Manufacturing System: A Model Development *Andari, Silmi Aprilia, Cardin, Olivier, Berruet, Pascal, Ardi, Romadhani*
12:20-12:40	State-Space Representation to Evaluate System Scalability in a Reconfigurable Manufacturing Environment *Dahmani, Abdelhak, Benyoucef, Lyes*

Viable and Reconfigurable Supply Chains, Intertwined Supply Networks and Ecosystems - 2

Thu. 11:00–12:40
Room C

11:00-11:20	Design a Sustainable Supply Chain for the Textile and Clothing Industry with Consideration of Carbon Life Cycle Emission *Mezatio, Eric Papain, Aghelinejad, Mohammadmohsen, Amodeo, Lionel, Ferreira, Isabelle*
11:20-11:40	Using Knowledge Graphs and Human-Centric Artificial Intelligence for Reconfigurable Supply Chains: A Research Framework *Rolf, Benjamin, Mebarki, Nasser, Lang, Sebastian, Reggelin, Tobias, Cardin, Olivier, Mouchère, Harold, Dolgui, Alexandre*
11:40-12:00	The Response of an OEM to Supply Chain Disruptions: Application of Chaos Theory *Mota, Sofia Lopes, Crispim, José António*
12:00-12:20	Lifecycle Traceability towards Sustainable and Circular Value Chains: Analysis Framework and State of the Art in the Fashion Industry *Riemens, Joséphine, Lemieux, Andrée-Anne, Lamouri, Samir*
12:20-12:40	Optimal Sustainability Efforts and Pricing Policies in a Two-Echelon Supply Chain *Arbabiun, Pouneh, Chutani, Anshuman, Touboulic, Anne*

Integrating Human/motions and IA in the Context of Industry 4.0

Thu. 11:00–12:40
Room D

11:00-11:20	An Economic Fault-Tolerant Transportation Strategy for Multiple Assembly Station Systems *Witczak, Marcin, Seybold, Lothar, Lipiec, Bogdan, Aubrun, Christophe, Mrugalski, Marcin*
11:20-11:40	Human-Centred Assembly and Disassembly Systems: A Survey on Technologies, Ergonomic, Productivity and Optimisation *Slama, Rim, Ben-Ammar, Oussama, Tlahig, Houda, Slama, Ilhem, Slangen, Pierre R. L.*
11:40-12:00	A Skill-Based MILP Model in Cellular Manufacturing Systems with Human-Robot Collaboration *Yetkin, Büşra, Ulutas, Berna*
12:00-12:20	Minimizing Workers' Workload in Partially Automated Assembly Lines with Human-Robot Collaboration *Dimény, Imre, Koltai, Tamas*
12:20-12:40	Modeling and Simulation of Human Behavior Impact on Production Throughput *Bouaziz, Nourddine, Bettayeb, Belgacem, Sahnoun, M'hammed, Yassine, Adnan, Latreche, Ameur*

Thursday, 14:00-15:40 – Parallel sessions VI

Industry 4.0 on a Shoestring: Low-Cost Approaches to Digitizing and Automating in Industrial Operations

Thu. 14:00–15:40
Room H

13:40-14:00	A Catalogue of Digital Solution Areas for Logistics SMEs *Macias-Aguayo, Jaime, McFarlane, Duncan Campbell, Schönfuß, Benjamin, Salter, Liz*
14:20-14:40	Blockchain Adoption for SMEs: Opportunities and Challenges *Idel Mahjoub, Yassine, Hassoun, Melissa, Trentesaux, Damien*
14:40-15:00	A Case Study: Digitalization of Business Processes of SMEs with Low-Code Method *Cai, Zhen, Huang, Yun, Kessler, Stephan, Fottner, Johannes*
15:00-15:20	Adoption of Advanced Technologies in Industrial Clusters. a Study in Latin American Industries *Quiroga, Oscar*
15:20-15:40	Service Based Approach to Asset Administration Shell for Controlling Testing Processes in Manufacturing *Rehman, Hamood Ur, Chaplin, Jack Christopher, Zarzycki, Leszek, Mo, Fan, Jones, Mark, Ratchev, Svetan*

Implementing Digital-Twin in Manufacturing and Logistics Systems: New Trends and Challenges

Thu. 14:00–15:40
Room J

13:40-14:00	A Digital-Twin Based Worker's Work Allocation Framework for a Collaborative Assembly System *Pabolu, Venkata Krishna Rao, Shrivastava, Divya, Kulkarni, Makarand*
14:20-14:40	Digital Twin and Human Factors in Manufacturing and Logistics Systems: State of the Art and Future Research Directions *Berti, Nicola, Finco, Serena*
14:40-15:00	A Roadmap towards an Automated Warehouse Digital Twin: Current Implementations and Future Developments *Ferrari, Andrea, Zenezini, Giovanni, Carlin, Antonio, Rafele, Carlo*
15:00-15:20	Using a Systems Approach to Model a Process Digital Twin *Herkes, Menno, Oversluizen, Gerlinde*
15:20-15:40	Towards Learning-Enabled Digital Twin with Augmented Reality for Resilient Production Scheduling *Greis, Noel, Nogueira, Monica, Rohde, Wolfgang*

RS04-Supply Chain Management

Thu. 14:00–15:40
Room KL

13:40-14:00	A Supplier Selection Decision Model Using Multi-Criteria Decision Analysis in a Small Manufacturing Company *Rodrigues, Márcio, Šírová, Eva, Mugurusi, Godfrey*
14:20-14:40	Supplier Selection in Supply Chain Management for an SME Using AHP: A Case Study *Singh, Pradeep*
14:40-15:00	An Integrated Heuristic Approach to Improve Supplier Delivery Performance *Sakhare, Chirag, Chakraborty, Sayan, Sarmah, S P*

For a Better Integration of Maintenance Optimization Issues in Production Management

Thu. 14:00–15:40
Room M

13:40-14:00	Hybrid Market with Product Competition: How Should a Green Product Survive? *Zhang, Yumeng, Zhang, Lina*
14:20-14:40	Models and Measures in Theory and Practice of Manufacturing Processes *Zvaritch, Valerij, Babak, Vitalii, Myslovych, Mychailo, Zaporozhets, Artur, Kuts, Yurii, Scherbak, Leonid*
14:40-15:00	Understanding the Enablers of Blockchain Technology Adoption in Sustainable Supply Chains: A DEMATEL-Based Analysis *Agi, Maher A. N.*
15:00-15:20	Production Planning and Control for Sustainable Management Systems *Wang, Lingxin, Abbou, Rosa, da Cunha, Catherine*
15:20-15:40	Prescriptive Block Replacement Policy for Production Degrading Systems *Esposito, Nicolas, Castanier, Bruno, Giorgio, Massimiliano*

Integrated Planning and Scheduling in Engineer-To-Order Industrial Contexts

Thu. 14:00–15:40
Room N

13:40-14:00	A Two-Level Optimization Approach for Engineer-To-Order Project Scheduling *Neumann, Anas, Hajji, Adnène, Rekik, Monia, Pellerin, Robert*
14:20-14:40	A Didactic Review on Genetic Algorithms for Industrial Planning and Scheduling Problems *Neumann, Anas, Hajji, Adnène, Rekik, Monia, Pellerin, Robert*
14:40-15:00	Parallel Identical Machines Scheduling to Minimize the Maximum Inter-Completion Time with Uncertain Processing Time *Sui, Yang, Wang, Zhaojie*
15:00-15:20	Integrated Prescriptive Maintenance and Production Planning: A Machine Learning Approach for the Development of an Autonomous Decision Support Agent *Elbasheer, Mohaiad, Longo, Francesco, Mirabelli, Giovanni, Padovano, Antonio, Solina, Vittorio, Talarico, Simone*
15:20-15:40	Study of Protection Mechanism of on Time Delivery with Smart Production Control System in Industry 4.0 *Chen, Hong*

RS16-Decision Support System

Thu. 14:00–15:40
Room B317

13:40-14:00	Multi-Criteria Prioritization of Asset Management Investments in the Power Industry *Biard, Gabrielle, Abdul-Nour, Georges, Komljenovic, Dragan, Stéphane, Pelletier*
14:20-14:40	Multicriteria Analysis by Promethee-Sapevo-M1 Method: Choice of Brazilian Sugar and Ethanol Plants for Biomethane Production *Costa, Wallace L. T., Costa, Igor Pinheiro de, Terra, Adilson V., Moreira, Miguel A. L., Gomes, Carlos F. S., Santos, Marcos*
14:40-15:00	Multi-Criteria Decision Making in a Multi-Method Framework with Application in Capability Acquisition and Enhancement *McIvor, Lily, Chakrabortty, Ripon*
15:00-15:20	Multi-Objective Inventory Optimization Problem for a Sustainable Food Supply Network under Lateral Inventory Share Policy *Y. Ekren, Banu, Chattopadhyay, Ritwika, Kumar, Vikas*
15:20-15:40	Optimizing a Linear Fractional Function Over an Integer Ecient Set of a Multi-Objective Linear Program *Younsi Abbaci, Leila, Moulai, Mustapha*

RS17-Modelling Supply Chain Dynamics

Thu. 14:00–15:40
Room B319

13:40-14:00	Centrality Measures in Supply Chain Management Research *Fouad, Hesham, Rego, Nazaré*
14:20-14:40	Optimal Dual-Channel Distribution Configuration of a Manufacturer under Showrooming *T.M., Rofin, Jacob, Jagan, Mahanty, Biswajit*
14:40-15:00	Study on Dual-Channel Supply Chain Game under Carbon Subsidy Policy *Ma, Junhai, Tian, Yi, Jiang, Hui*
15:00-15:20	Analysis of Dynamic Game with Government Subsidy in the Telecommunication Industry *Ma, Junhai, Naicong, Ning, Wang, Zongxian*
15:20-15:40	The Effect on Duopoly Optimal Quantity Decision and Complex Analysis under Low-Carbon Transformation *Wang, Zongxian, Ma, Junhai*

RS15-Simulation

Thu. 14:00–15:40
Room B

13:40-14:00	New Simulation Model for Workload Analysis Addressing Occupational Stress in a Production Company *Abdelzaher, Abdulrahman A., Kharbeche, Mohamed*
14:20-14:40	Simulation Modelling As a Decision Support Tool: A Case Study for Restarting a Cast Production Line *Jovanoski, Bojan, Minovski, Robert, Jovanoski, Delcho, Krzovski, Mitko, Argilovski, Aleksandar*
14:40-15:00	Measuring Blood Supply Chain Performance Using Monte-Carlo Simulation *Elsayed, Nirmeen, Taha, Ragda, Hassan, Mohamed*
15:00-15:20	Analysis of Food Distribution Network Using Anylogistix Computational Tool *Alves, Lucas, Costa, Igor Pinheiro de, Terra, Adilson Vilarinho, Medina, Afonso C., Gomes, Carlos F. S., Santos, Marcos*

RS13-Knowledge Management, Decision Support Systems

Thu. 14:00–15:40
Room C

13:40-14:00	Compiling Capacitated Single-Item Lot-Sizing Problem in a CostMDD *Khellaf, Walid, Guillaume, Romain, Lamothe, Jacques*
14:20-14:40	Creation of a Knowledge Space by Semantically Linking Data Repository and Knowledge Management System - a Use Case from Production Engineering *Sheveleva, Tatyana, Wawer, Max, Oladazimi, Pooya, Koepler, Oliver, Nürnberger, Florian, Lachmayer, Roland, Auer, Sören, Mozgova, Iryna*
14:40-15:00	2-Tuple Linguistic Model-Based Circular Maturity Assessment Methodology: A Case for Agriculture *Uzturk, Deniz, Buyukozkan, Gulcin*
15:00-15:20	Industry 4.0 and Knowledge Management: The Impact on Operational Performance *Lista, Ana Paula, Tortorella, Guilherme*
15:20-15:40	Analysis of Knowledge Management and Total Quality Management Application into Tunisian Small and Medium Enterprises *Lehyani, Fatma, Keskes, Mohamed Amir, Zouari, Alaeddine*

RS02-Industry 4.0

Thu. 14:00–15:40
Room D

13:40-14:00	Development of a Collaborative Tool for Data Valorisation in SMEs *Toumelin, Aime, Agard, Bruno, Leduc, Maxime*
14:20-14:40	Lean 4.0: Synergies between Lean Management Tools and Industry 4.0 Technologies *Elafri, Nedjwa, Jordan, Tappert, Rose, Bertrand, Maleh, Yassine*
14:40-15:00	Modeling Lean and Technologies of Industry 4.0 Integration for Enterprise Performance *Urquia, Ilse Denisse, Amrani, Aïcha, Vallespir, Bruno*
15:00-15:20	Lean 4.0: Typology of Scenarios and Case Studies to Characterize Industry 4.0 Autonomy Model *Rosin, Frédéric, Magnani, Florian, Joblot, Laurent, Forget, Pascal, Pellerin, Robert, Lamouri, Samir*
15:20-15:40	Industrial Plants Commissioning Procedures Using Digital Process-Oriented Architecture *de Mattos Nascimento, Daniel Luiz, Brancher Roeder, Alessandra, Calvetti, Diego, Mustelier Menes, Alejandro, Rodrigues Gonzalez, Fernando*

Thursday, 17:00-18:40 – Parallel sessions VII

RS10-Scheduling

Thu. 17:00–18:40
Room G

17:00-17:20	A Matheuristic Approach to the Open Shop Scheduling Problem with Sequence-Dependent Setup Times *Pastore, Erica, Alfieri, Arianna, Castiglione, Claudio, Nicosia, Gaia, Salassa, Fabio*
17:20-17:40	Polynomial-Size Models to Minimize Total Completion Time in a Parallel Batching Environment *Druetto, Alessandro, Grosso, Andrea*
17:40-18:00	Scheduling Unrelated Parallel Machines with a Common Server and Sequence Dependent Setup Times *Raboudi, Houda, Alpan, Gülgün, Mangione, Fabien, Tissot, Geoffrey, Noël, Frédéric*
18:00-18:20	Computing Fair Solutions in Single Machine Scheduling *Cosmi, Matteo, Nicosia, Gaia, Pacifici, Andrea*
18:20-18:40	Minimizing Total Weighted Completion Times for Semi-Online Single Machine Scheduling *Nouinou, Hajar, Arbaoui, Taha, Yalaoui, Alice*

Development of Digital Twins to Mitigate Major Disruptive Events: The PostCovid Era

Thu. 17:00–18:40
Room J

17:00-17:20	Framework for Planning and Implementation of Digital Process Twins in the Field of Internal Logistics *Zuhr, Pascal, Rissmann, Lukas, Meißner, Sebastian*
17:20-17:40	Two New Heuristics for Assigning Customers to Depots in the Multi-Depot Vehicle Routing Problem *Torres-Pérez, Isis, Rosete, Alejandro, Sosa Gómez, Guillermo, Rojas, Omar*
17:40-18:00	Resilience in Supply Chains: An Agent-Based Solution Strategy *García Roa, Eduardo, Marmolejo-Saucedo, Jose Antonio*

RS06-Decision-Support for Human Operators

Thu. 17:00–18:40
Room KL

17:00-17:20	Monitoring of Shop-Floor Workers Postural Stability through the Use of Smart Soles *Teixeira, Diogo, Ferreira, Jose, Jardim-Goncalves, Ricardo*
17:20-17:40	AI-Based Improvement of Decision-Makers' Knowledge in Production Planning and Control *Franke, Felix, Franke, Susanne, Riedel, Ralph*
17:40-18:00	A Review of Computer Vision Techniques Used to Limit COVID19's Spreading: The Case of Social Distancing Measurement *Guarret, Chaymae, Retmi, Kawtar, Ouzayd, Fatima, Echcheikh, Hamid*

Resilience of Cyber-Physical Production Systems in Industry 4.0: Issues, Modelling, Implementation and Evaluation

Thu. 17:00–18:40
Room M

17:00-17:20	Architecture for Preventing and Detecting Cyber-Attacks in Cyber-Manufacturing Systems *Prasad, Romesh, Moon, Young*
17:20-17:40	Resilience Enhancing Mechanisms for Cyber-Manufacturing Systems against Cyber-Attacks *Espinoza, Carlos, Moon, Young*
17:40-18:00	Towards a Framework to Position Resilience and Industry 4.0 *Goepp, Virginie, Berrah, Lamia, Drira, Emna, Chaabane, Sondes*
18:00-18:20	Evaluation of Operational Resilience in Cyber-Physical Manufacturing Systems: A Literature Review *Attajer, Ali, Chaabane, Sondes, Darmoul, Saber, Sallez, Yves, Riane, Fouad*

RS08-Location

Thu. 17:00–18:40
Room N

17:00-17:20	A Modified Simulated Annealing and an Enhanced Harmony Search Algorithms for CFLP *Lakehal, Soumaya, Aitzai, Abdelhakim*
17:20-17:40	Uncapacitated (Facility) Location Problem: A Hybrid Genetic-Tabu Search Approach *Alidaee, Bahram, Wang, Haibo*
17:40-18:00	Location of Micro-Urban Consolidation Centres for the Superblocks in Barcelona *Savall-Manyó, Maria, Ribas, Imma*

Big Data Analytics and Machine Intelligence for Management Decision-Making in Complex Systems

Thu. 17:00–18:40
Room B317

17:00-17:20	Dynamic Selection of Priority Rules Based on Deep Reinforcement Learning for Rescheduling of RCPSP *Wang, Teng, Cheng, Wei, Zhang, Yahui, Hu, Xiaofeng*
17:20-17:40	An Adaptive Threshold Strategy Based on Genetic Optimization for Nonlinear Dynamic Process Monitoring *Sun, Yan-Ning, Xu, Hong-Wei, Qin, Wei*
17:40-18:00	Unified Model towards Service-Oriented Continuous-Discrete Hybrid Adaptive Milling System for Thin-Walled Parts Driven by In-Process Data *Zhao, Xiong, Zheng, Lianyu, Shi, Maoyuan, Wang, Yiwei*
18:00-18:20	An Improved XGBoost Prediction Model for Multi-Batch Wafer Yield in Semiconductor Manufacturing *Xu, Hong-Wei, Qin, Wei, Sun, Yan-Ning*
18:20-18:40	A Novel Strip Steel Defect Identification Approach Based on Improved YOLOv5s *Li, Xixing, Yang, Rui, Hongtao, Tang*

Blockchain in the Operations and Supply Chain Management

Thu. 17:00–18:40
Room B319

17:00-17:20	Building Resilience and Innovation through Intelligent Diverse Supplier Engagement *Wang, Yingli, Skeete, Jean-Paul, Barker, John, Filimonov, Maxim*
17:20-17:40	A Framework Based on Blockchain, Artificial Intelligence, and Big Data Analytics to Leverage Supply Chain Resilience Considering the COVID-19 *Fosso Wamba, Samuel, Queiroz, Maciel M.*
17:40-18:00	Blockchain and Trust in Supply Chain Management: A Conceptual Framework *Alkhudary, Rami, Pierre, Féniès*

18:00-18:20	Industry 4.0 Technologies in Maternal Healthcare: A Systematic Review *Sibanda, Khulekani, Ndayizigamiye, Patrick, Twinomurinzi, Hossana*
18:20-18:40	International Journal of Production Research Over the past 25 Years: A Retrospective Bibliometric Analysis *Ciric Lalic, Danijela, Marjanovic, Ugljesa, Lalic, Bojan, Savkovic, Milena, Lolic, Teodora*

Maintenance-Free Factory: Concepts, Models and Innovative Approaches

Thu. 17:00–18:40
Room B

17:00-17:20	Investigation of Ductile/brittle Chip Formation Zone in the Context of Manufactured Geometry with Different CAM Paths Strategies *Móricz, László, Viharos, Zsolt János*
17:20-17:40	Digital Factory to Support Deadlines Prediction in Small Volume Production *Debevec, Mihael, Simic, Marko, Herakovic, Niko*
17:40-18:00	An Approach for AI-Based Forecasting of Maintenance Orders for MRO Scheduling *Öhlinger, Florian, Greimel, Lisa, Glawar, Robert, Sihn, Wilfried*
18:00-18:20	Maintenance-Free Factory: A Holistic Approach for Enabling Sustainable Production Management *Glawar, Robert, Ansari, Fazel, Reichsthaler, Luisa, Sihn, Wilfried, Toth, Daniel*
18:20-18:40	The Application of Supply Chain Digital Twin to Measure Optimal Inventory Policy *Maheshwari, Pratik, Kamble, Suchet*

The Future of Interoperability in the Enterprise of the Future

Thu. 17:00–18:40
Room C

17:00-17:20	Integrated Resource Management in the Digital Ecosystem of the Enterprise Based on Intelligent Consorts *Bakhtadze, Natalia, Elpashev, Denis, Suleykin, Aleksandr, Novikov, Dmitry*
17:20-17:40	A Cold Chain Traceability with IoT and Blockchain Scalable Project for SMEs: First Phase *Ramirez Meneses, Cristina, Rojas, Alix E., Garcia, Alexander*
17:40-18:00	Towards a Smart Connector for Dynamic Interoperability in Agile Enterprises *Belkadi, Farouk, Vieille, Jean, Tanous, Bernard*
18:00-18:20	Qualitative Analyses of Semantic Interoperability Approaches: Toward Learning Based Model Transformations *Brilhault, Quentin, Yahia, Esma, Roucoules, Lionel*
18:20-18:40	Data Model Classification for Interoperability in the Industry *Chen, Yuhan, Annebicque, David, Carre-Menetrier, Veronique, Philippot, Alexandre, Daneau, Thierry*

RS05-Pricing

Thu. 17:00–18:40
Room D

17:00-17:20	Refund Policy and Threat of Encroachment with Consumer Behaviors *Shi, Baoli, Xu, Qi, Sun, Zhongmiao*
17:20-17:40	Prices and Profits in Centralized Dual-Channel Supply Chains under Competition *Nair, Ranjit B, K P, Abijith, Abraham, Anand Jacob, Kondareddy, Ratna Kumar, R, Sridharan*
17:40-18:00	Integrated Lot-Sizing and Pricing Problem under Cross-Price Demand Model *Terzi, Mourad, Ouazene, Yassine, Yalaoui, Alice, Yalaoui, Farouk*
18:00-18:20	The Development of Market Structure of Heterogeneous Firms *Arunas, Burinskas, Aurelija Burinskienė, Aurelija*
18:20-18:40	The Dynamics of Customer Satisfaction Dimension Based on BERT, SHAP, and Kano Model *Park, Hyunwoo, Jeon, Hyunju*

Friday, 8:15-9:55 – Parallel sessions VIII

Industrial Robotics: Modeling, Control and Applications - 1

Fri. 08:15–09:55
Room G

08:15-08:35	Analytical Estimation of Interaction Force and Its Application Point for Collaborative Robots *Popov, Dmitry, Klimchik, Alexandr, Pashkevich, Anatol*

08:35-08:55	Assembly Sequence Planning with Deformable Linear Objects in the Smart Factory: Dilemmas and Injections *Shneor, Ran, Berman, Sigal*
08:55-09:15	Development of an Affordable and Auto-Reconfigurable Solution for Small Box Assembly *Wang, Zi, Kendall, Peter, Gumma, Kevin, Smith, Andy, Turner, Alison, Ratchev, Svetan*
09:15-09:35	Planar Shape Control of Deformable Linear Objects *Almaghout, Karam, Klimchik, Alexandr*
09:35-09:55	On Smooth Planar Curvilinear Motion of Cable-Driven Parallel Robot End-Effector *Marchuk, Eugene, Kalinin, Yaroslav, Maloletov, Alexander*

Special Session Dedicated to the Memory of Dr. Jean-Marie Proth - 3

Fri. 08:15–09:55
Room H

08:15-08:35	A New Stochastic Bi-Level Optimization Model for Post-Disaster Relief Scheduling Problem in Sustainable Humanitarian Supply Chains with Uncertain Relief Supplies and Demands *Liu, Ming, Lin, Tao, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
08:35-08:55	Exact Methods for Tardiness Objectives in Production Scheduling *Avgerinos, Ioannis, Mourtos, Ioannis, Vatikiotis, Stavros, Zois, Georgios*
08:55-09:15	A Population Based CP Methodology for the Flexible Job-Shop Scheduling Problem with Resource Constraints *Kasapidis, Grigoris, Paraskevopoulos, Dimitris, Mourtos, Ioannis*
09:15-09:35	Job Shop Scheduling: A Novel DRL Approach for Continuous Schedule-Generation Facing Real-Time Job Arrivals *Hammami, Nour El Houda, Lardeux, Benoit, Hadj-Alouane, Atidel B., Jridi, Maher*

Supply Chain Resilience and Viability - 1

Fri. 08:15–09:55
Room I

08:15-08:35	Towards Digital Supply Chain Risk Surveillance *Brintrup, Alexandra, Kosasih, Edward*
08:35-08:55	IT Project Management: Supply Chain Optimization for Service Operations *Zalozhnev, Alexey, Peremezhko, Denis*
08:55-09:15	Dynamical Analysis of (r, Q) Inventory Policy in Multi-Modal Distribution Systems with Uncertain Goods Delivery Time *Ignaciuk, Przemyslaw*
09:15-09:35	Joint Optimization of Safety Stock Placement and Supplier Selection in a Multi-Layered Distribution Network *Chamani, Cheshmeh, Van Gheluwe, Casper, Aghezzaf, El-Houssaine*

Digital Twins in Cyber-Physical Production Systems

Fri. 08:15–09:55
Room J

08:15-08:35	Associative Rules-Driven Intelligent Production Schedule Control System for Digital Manufacturing Ecosystem *Suleykin, Aleksandr, Bakhtadze, Natalia, Elpashev, Denis, Pyatetsky, Valery*
08:35-08:55	Asset Administration Shell in Manufacturing: Applications and Relationship with Digital Twin *Abdel-Aty, Tasnim A., Negri, Elisa, Galparoli, Simone*
08:55-09:15	Clearing Function-Based Simulation Optimization for Release Planning under Digital Twin Wafer Fabs *Zhang, Zhengmin, Gong, Yeming, Guan, Zailin*
09:15-09:35	Integration of Artificial Intelligence in the Lifecycle of Industrial Digital Twins *Abdoune, Farah, Nouiri, Maroua, Cardin, Olivier, Castagna, Pierre*
09:35-09:55	Key Research Challenges in Digital Twin Applications for Demanufacturing *Abumadi, Farah, Semeraro, Concetta, Ghani Olabi, Abdul, Dassisti, Michele*

Recent Advances of Discrete Optimization and Scheduling - 1

Fri. 08:15–09:55
Room KL

08:15-08:35	Comparison of Mathematical Programming Models for Optimization of Transshipment Point Seaport - Railway *Grishin, Egor, Pravdivets, Nikolay, Morozov, Nikolai, Lazarev, Alexander, Korovkin, Dmitry, Tyulenev, Ilia*
08:35-08:55	A MILP Approach for Detailed Pipeline Scheduling and Storage Management Problem in the Phosphate Industry *Tchernev, Nikolay, Sidki, Mouad, Elfirdoussi, Selwa*

08:55-09:15	Approaches to Solving the Problem for Increasing the Capacity of Operating Rooms *Lazarev, Alexander, Lemtyuzhnikova, Darya, Somov, Mikhail*
09:15-09:35	Two Heuristics for One of Bin-Packing Problems *Barashov, Egor, Grishin, Egor, Lemtyuzhnikova, Darya*
09:35-09:55	Large-Scale Discrete-Time Scheduling Optimization: Industrial-Size Applications *Franzoi, Robert Eduard, Menezes, Brenno*

Digital Supply Chain - 1

Fri. 08:15–09:55
Room M

08:15-08:35	Blockchain Adoption in a Supply Chain with Different Power Structures and Consumer Preferences *Sun, Zhongmiao, Xu, Qi, Shi, Baoli*
08:35-08:55	Using Digital Twins for Inventory and Cash Management in Supply Chains *Badakhshan, Ehsan, Ball, Peter, Badakhshan, Ali*
08:55-09:15	Suppliers' Corporate Social Responsibility Efforts with Greenwashing Concerns: Can Blockchain Help? *Yao, Shuning, Liu, Yuanyi, Shi, Xiutian*
09:15-09:35	On the Importance of Data for Supply Chain Network Design Projects *Meyer, Christoph Manuel*
09:35-09:55	The Interaction between Dual Sourcing and Blockchain Adoption under Yield Uncertainty *Liu, Yang, Ivanov, Dmitry*

Ontology-Based Development of Industrial Systems - 1

Fri. 08:15–09:55
Room B317

08:15-08:35	Ontology-Based Collaborative Assembly in Aerospace Industries *Kazantsev, Nikolai, Sampaio, Pedro, Mehandjiev, Nikolay, Stalker, Iain Duncan*
08:35-08:55	Integrated Simulation-Optimization Modeling Framework of Resilient Design and Planning of Supply Chain Networks *Ivanov, Dmitry, Dolgui, Alexandre, Sokolov, Boris, Ivanova, Marina*
08:55-09:15	The Role of Industrial Resources in Reconfigurable Aerospace Production Systems: A Preliminary Literature Review *Arista Rangel, Rebeca, Mas, Fernando, Morales-Palma, Domingo, Oliva Olvera, Manuel, Vallellano, Carpóforo*
09:15-09:35	Ontology-Centric Industrial Requirements Validation for Aircraft Assembly System Design *Hu, Xiaodu, Arista Rangel, Rebeca, Lentes, Joachim, Lu, Jinzhi, Zheng, Xiaochen, Sorvari, Jyri, Ubis, Fernando, Kiritsis, Dimitris*

Replenishment Planning and Lot-Sizing under Uncertainty - 1

Fri. 08:15–09:55
Room B319

08:15-08:35	Capacitated Stochastic Lot-Sizing and Production Planning Problem under Demand Uncertainty *Seyfi, Seyed Amin, Yilmaz, Gorkem, Yanikoglu, İhsan, Garip, Alpaslan*
08:35-08:55	On the Inventory Performance of Demand Forecasting Methods of Medical Items in Humanitarian Operations *Rostami-Tabar, Bahman, Hasni, Marwa, Babai, M. Zied*
08:55-09:15	Digital Twin for Inventory Planning of Fresh Produce *Melesse, Tsega Yenew, Bollo, Matteo, Di Pasquale, Valentina, Riemma, Stefano*
09:15-09:35	Supply Planning and Inventory Control under Lead Time Uncertainty: A Literature Review and Future Directions *Ben-Ammar, Oussama, Dolgui, Alexandre, Hnaien, Faicel, Ould Louly, Aly Mohamed*

The Ripple Effect, Supply Chain Viability and COVID-19 Pandemic - 1

Fri. 08:15–09:55
Room B320

08:15-08:35	Managing Panic Buying-Related Instabilities in Supply Chains: A COVID-19 Pandemic Perspective *Rahman, Towfique, Paul, Sanjoy Kumar, Shukla, Nagesh, Agarwal, Renu, Taghikhah, Firouzeh*
08:35-08:55	Supply Chain Sustainability and Resilience - Relationship and Congruent Capability Analysis Based on Paradox Theory *Warmbier, Piotr, Kinra, Aseem, Ivanov, Dmitry*
08:55-09:15	Modelling COVID-19 Supply Chain Disruption and Recovery: A Case Study from the E-Commerce Industry *Muralidharan, Priya, Hargaden, Vincent, Ghadimi, Pezhman*

09:15-09:35	Business Continuity, Disaster Readiness and Performance in COVID-19 Outbreak Aftermath: A Survey *El Baz, Jamal, Ruel, Salomée*	

Emerging Challenges for Robotics and Autonomous Systems in the Industry 4 Environment - 1

Fri. 08:15–09:55
Room B

08:15-08:35	ROBxTASK RTE - a Lightweight Runtime Environment to Implement Collaborative Processes across Different Robotic Systems *Zörrer, Helmut, Propst, Matthias, Weichhart, Georg, Pichler, Andreas, Strohmeier, Felix, Schmoigl-Tonis, Mathias*	
08:35-08:55	A Nonlinear Discrete-Time Sliding Mode Controller for Autonomous Navigation of an Aerial Vehicle Using Hector SLAM *Can, Aydin, Price, Joshua, Montazeri, Allahyar*	
08:55-09:15	Distributed Robust Synchronization Control of Heterogeneous Multiple Quadcopters with an Active Virtual Leader *Imran, Imil, Montazeri, Allahyar*	
09:15-09:35	Adaptive Integral Terminal Sliding Mode Control for the Nonlinear Active Vehicle Suspension System under External Disturbances and Uncertainties *Ghadiri, Hamid, Montazeri, Allahyar*	
09:35-09:55	A Dynamic Programming Approach for Batch Cycle Time Optimization in Hot Metal Forming *Nievas, Nuria, Pagès-Bernaus, Adela, Bonada Bo, Francesc, Echeverria Rovira, Lluís, Abio Rojo, Albert*	

Modelling and Optimization of Deteriorating Inventories - 1

Fri. 08:15–09:55
Room C

08:15-08:35	Analysis of a JIT Stochastic Inventory System for Deteriorating Items *Pérez, Freddy, Torres, Fidel, Amaya, Ciro Alberto*	
08:35-08:55	Inventory Management of Vertically Differentiated Perishable Products with Stock-Out Based Substitution *Gioia, Daniele Giovanni, Felizardo, Leonardo Kanashiro, Brandimarte, Paolo*	
08:55-09:15	Production Policy Optimization in the Systems with Perishable Products under Seasonal Demand *Polotski, Vladimir*	
09:15-09:35	Optimizing Product Assortment, Joint Replenishments, and Storage Capacity Allocation in a Deteriorating Inventory System *Castellano, Davide, Gallo, Mosè, Grassi, Andrea, Santillo, Liberatina Carmela*	
09:35-09:55	Location Advantages of the Container Port in Murcia Region for Perishable Goods *Bogataj, David, Bogataj, Marija, Campuzano-Bolarín, Francisco*	

Friday, 11:00-12:40 – Parallel sessions IX

Industrial Robotics: Modeling, Control and Applications - 2

Fri. 11:00–12:40
Room G

11:00-11:20	A Review on Collaborative Robot Assembly Line Balancing Problems *Kheirabadi, Mahboobe, Keivanpour, Samira, Chinniah, Yuvin, Frayret, Jean-Marc*	
11:20-11:40	Experimental Study on Robot Calibration Approaches *Kozlov, Pavel, Klimchik, Alexandr*	
11:40-12:00	Interactive Industrial Robot Programming Based on Mixed Reality and Full Hand Tracking *Ostanin, Mikhail, Zaitsev, Stanislav, Sabirova, Adelia, Klimchik, Alexandr*	
12:00-12:20	Dynamic Modelling and Control of a Luxury Arts and Crafts Product *Porez, Mathieu, Ferré, Victorien*	
12:20-12:40	Discrete-Time Adaptive Control of Pneumatic Actuators for 6-DoF Stewart Platform *Kuznetsov, Nikolay, Andrievsky, Boris, Zaitceva, Iuliia, Kudryashova, Elena, Kuznetsova, Olga*	

Special Session Dedicated to the Memory of Dr. Jean-Marie Proth - 4

Fri. 11:00–12:40
Room H

11:00-11:20	Simultaneously Updating Multiple Performance Measures of Manufacturing Systems after Scheduling Perturbations *Madraki, Golshan, Mousavian, Seyedamirabbas*	

11:20-11:40	Intelligent Decision Support System Based on Video Recognition of Tuyere Hearth in a Blast Furnace *Bakhtadze, Natalia, Beginyuk, Vitaly A., Elpashev, Denis, Zakharov, Eddy, Salikhov, Zufar, Chereshko, Alexey*
11:40-12:00	A Mathematical Programming Approach for Optimizing On-Specs Production for Industrial Processes under Input Uncertainty *Eirinakis, Pavlos, Koronakos, Gregory*
12:00-12:20	Closed-Loop Inventory Routing Problem for Perishable Food with Multi-Type Returnable Transport Items *Zhang, Yipei, Chu, Feng, Che, Ada*

Supply Chain Resilience and Viability - 2

Fri. 11:00–12:40
Room I

11:00-11:20	Interpretable Machine Learning to Improve Supply Chain Resilience, an Industry 4.0 Recipe *Hydarbakian, Sadeq, Sepehri, Mehran*
11:20-11:40	A Methodological Framework for Efficient and Resilient Supply Network Design *Aldrighetti, Riccardo, Calzavara, Martina, Zennaro, Ilenia, Battini, Daria, Ivanov, Dmitry*
11:40-12:00	Lean and Legacy Supply Chains for Coordinated Demand Driven Production to Handle Disruptions *Gudavalleti, Pavan Kumar, Singh, Mahendra Pal, Saddikutti, Venkataramaniah*
12:00-12:20	Application of Analytics to Achieve Supply Chain Resilience *Cohen, Morris*

Industry 4.0 and Tradeoff between Efficiency and Resilience

Fri. 11:00–12:40
Room J

11:00-11:20	The Effect of Complexity on the Resilience and Efficiency of Integrated Healthcare Systems: The Moderating Role of Big Data Analytics *Zaza, Valeria, Bisceglie, Maddalena, Valerio, Silvana, Giannoccaro, Ilaria*
11:20-11:40	Simulating the Network Structures in the Circular Economy and Their Impact on Resilience *Massari, Giovanni Francesco, Giannoccaro, Ilaria*
11:40-12:00	On the Synergetic Relationship between Circular Economy and Resilience: Findings from a Systematic Literature Review *Massari, Giovanni Francesco, Annarelli, Alessandro, Primario, Simonetta, Puliga, Gloria*

Recent Advances of Discrete Optimization and Scheduling - 2

Fri. 11:00–12:40
Room KL

11:00-11:20	A Metric Approach for the Two-Station Single-Track Railway Scheduling Problem *Cheng, T. C. E., Lazarev, Alexander, Lemtyuzhnikova, Darya*
11:20-11:40	A New Interpolation-Based Polynomial Algorithm for Estimating Lateness in Single Machine Scheduling Problem *Lazarev, Alexander, Lemtyuzhnikova, Darya, Tyunyatkin, Andrey, Battaïa, Olga*
11:40-12:00	Simulation Approach for Day-Ahead Production Scheduling of a Power Plant *Nekrasov, Ivan, Pravdivets, Nikolay*
12:00-12:20	Single Track Transportation in a Two-Machine Production System *Zinder, Yakov, Lazarev, Alexander, Musatova, Elena*
12:20-12:40	Analysis of the Feasibility to Use Metric Approach for NP-Hard Makespan Minimization Problem *Kudinov, Ilya, Lemtyuzhnikova, Darya, Bukueva, Elena*

Digital Supply Chain - 2

Fri. 11:00–12:40
Room M

11:00-11:20	On the Development of a Blockchain-Implementable Intermediation Model for Digital Supply Chains *Grassi, Andrea, Guizzi, Guido, Santillo, Liberatina Carmela, Vespoli, Silvestro, Arlinghaus, Julia*
11:20-11:40	The Manual Collection of Data on Disruptions: Technology Acceptance Factors for Industry 5.0 Technologies *Breiter, Stephan, Arlinghaus, Julia*
11:40-12:00	Big Data Analytics and Its Applications in Supply Chain Management: A Literature Review *Mogale, Dnyaneshwar, Ghadge, Abhijeet*
12:00-12:20	A Review of Blockchain Technology Application on Supply Chain Risk Management *Hu, Yang, Ghadimi, Pezhman*

12:20-12:40	Recording Data on Production Disruptions: Usability and Data Quality *Breiter, Stephan, Gottwald, Jonas, Arlinghaus, Julia*

Advances in Decentralised Management and Control of Industry 4.0 Manufacturing Systems - 2

Fri. 11:00–12:40
Room N

11:00-11:20	Dynamic Scheduling of a Due Date Constrained Flow Shop with Deep Reinforcement Learning *Marchesano, Maria Grazia, Guizzi, Guido, Popolo, Valentina, Converso, Giuseppe*
11:20-11:40	Analysis of Quality Issues in Production with Multi-View Coordination Assets *Kropatschek, Sebastian J., Steuer, Thorsten, Kiesling, Elmar, Meixner, Kristof, Ayatollahi, Iman, Sommer, Patrik, Biffl, Stefan*
11:40-12:00	A Survey of the Underlying Success Factors of Maintenance Digital Transformation *Saihi, Afef, Ben-Daya, Mohamed, As'ad, Rami*
12:00-12:20	Three-Faceted Manufacturing Knowledge Representation in Cloud Environments *Drexel, Damian, Hoch, Ralph*
12:20-12:40	Analysis of the Stability and Dynamic Fluctuation of Electric Energy Supply under Energy Structure Reform *Ahmed, Waqas, Ma, Junhai*

Ontology-Based Development of Industrial Systems - 2

Fri. 11:00–12:40
Room B317

11:00-11:20	Code Generation Approach Supporting Complex System Modeling Based on Graph Pattern Matching *Ding, Jie, Lu, Jinzhi, Wang, Guoxin, Ma, Junda, Kiritsis, Dimitris, Yan, Yan*
11:20-11:40	Towards an Ontology for a Lightweight Support System for Production System Rough Planning *Lentes, Joachim*
11:40-12:00	Detecting Failure of a Material Handling System through a Cognitive Twin *D'Amico, Rosario Davide, Sarkar, Arkopaul, Karray, Hedi, Addepalli, Sri, Erkoyuncu, John*

Replenishment Planning and Lot-Sizing under Uncertainty - 2

Fri. 11:00–12:40
Room B319

11:00-11:20	A System Dynamics Simulation on International Dual-Source Procurement Strategy under the Influence of Tariff and Supplier Reliability *Lai, Xinfeng, Wang, Xin, Chen, Zhixiang*
11:20-11:40	Variable Neighborhood Search for the Capacitated Lot Sizing Problem with Remanufacturing and Overtime *Eldalgamouny, Omar, Kaoud, Essam, Abdel-Aal, Mohammad*
11:40-12:00	An Improved Approximate Dynamic Programming Method for the Integrated Fleet Sizing and Replenishment Planning Problem with Predetermined Delivery Frequencies *Aghazadeh, Duygu, Ertogral, Kadir*

The Ripple Effect, Supply Chain Viability and COVID-19 Pandemic - 2

Fri. 11:00–12:40
Room B320

11:00-11:20	Competitive Relocation of Shortage Supply in a Distribution Network *Krylatov, Alexander, Lonyagina, Yulia, Raevskaya, Anastasiya*
11:20-11:40	Resource Sharing between Suppliers for a Flexible Recovery During Disruption *Hosseinnezhad, Davoud, Heavey, Cathal, Nugroho, Yohanes K.*
11:40-12:00	Disruption Evaluation in End-To-End Semiconductor Supply Chains Via Interpretable Machine Learning *Jaenichen, Friedrich-Maximilian, Liepold, Christina J., Ismail, Abdelgafar, Schiffer, Maximilian, Ehm, Hans*
12:00-12:20	COVID-19 Pandemic: Supply Chain Risk Management by Integrating Interpretive Structural Modeling and Bayesian Belief Network *Pellegrino, Roberta, Barbara, Gaudenzi, Qazi, Abroon*

Emerging Challenges for Robotics and Autonomous Systems in the Industry 4 Environment - 2

Fri. 11:00–12:40
Room B

11:00-11:20	Control of a Robot Axis with Effort Feedback *Torres, Sofia, Robet, Pierre-philippe, Aoustin, Yannick, Gautier, Maxime, Martins, Jorge*
11:20-11:40	Quadrotor Attitude and Altitude Tracking Control Using Finite Discrete-Time Linear Quadratic Tracking Controller *Aghazamani, Amir Mohammad, Khodabandeh, Mahdi, Razavi-Far, Roozbeh, Zarei, Jafar, Saif, Mehrdad*
11:40-12:00	Genetic Algorithm-Based Sliding Mode Control of a Human Arm Model *Kheshti, M.R., Tavakolpour-Saleh, Alireza, Razavi-Far, Roozbeh, Zarei, Jafar, Saif, Mehrdad*
12:00-12:20	Robust Formation Control and Trajectory Tracking of Multiple Quadrotors Using a Discrete-Time Sliding Mode Control Technique *Can, Aydin, Imran, Imil, Price, Joshua, Montazeri, Allahyar*
12:20-12:40	Simulation of Remote Manipulator Control System with Saturated Actuator *Zaitceva, Iuliia, Andrievsky, Boris, Kuznetsov, Nikolay, Popov, Alexander M.*

Modelling and Optimization of Deteriorating Inventories - 2

Fri. 11:00–12:40
Room C

11:00-11:20	POLCA vs. RF-POLCA: Performance Assessment by Simulation *Lopes, Bruno, Fernandes, Nuno O., Ferreira, Luis Pinto, Silva, Francisco José Gomes, Silva, Cristóvão, Carmo-Silva, Sílvio*
11:20-11:40	Optimization on Deteriorating Inventories During a Sudden Pandemic Situation *S, Tharani*
11:40-12:00	On Computational Procedures for Optimising an Omni-Channel Inventory Control Model *Goedhart, Joost, Hendrix, Eligius MT*
12:00-12:20	Multi-Echelon Inventory Optimization in Closed-Loop Supply Chain *Rodrigue, Fokouop Wafo, Jemai, Zied, Evren, Sahin, Yves, Dallery*
12:20-12:40	Economic Production Quantity with Inventory Rationing for a Decaying Item *Castellano, Davide, Glock, Christoph*

Friday, 14:45-16:25 – Parallel sessions X

E-Health Monitoring System: AI Applied to Anomaly Detection

Fri. 14:45–16:25
Room G

14:45-15:05	Anomaly Detection Method Applied to Vehicle Monitoring *Garcia, Pablo, Agard, Bruno, Saunier, Nicolas*
15:05-15:25	An IoT-Based Maintenance Framework for Irrigation and Drainage Water Management System at Regional Scale *Guidani, Beatrice, Accorsi, Riccardo, Lupi, Giacomo, Manzini, Riccardo, Ronzoni, Michele*
15:25-15:45	Development and Validation of an Overall Equipment Efficiency Measurement Model for Supporting Operational Excellence *Kiridena, Senevi, Li, Wenxu, Dwight, Richard Albert*
15:45-16:05	Optimal Replacement of Production Assets under Uncertain Technological Change *Hritonenko, Natali, Yatsenko, Yuri*
16:05-16:25	Early Semiconductor Anomaly Detection Based on Multivariate Time-Series Classification Using Multilayer Perceptron *Mellah, Samia, Trardi, Youssef, Graton, Guillaume, Ananou, Bouchra, El Adel, El Mostafa, Ouladsine, Mustapha*

Special Session Dedicated to the Memory of Dr. Jean-Marie Proth - 5

Fri. 14:45–16:25
Room H

14:45-15:05	A Bayesian Network Method for Humanitarian Supply Chain Performance Evaluation *Wang, Lu, Ding, Yueyu, Wang, Yunfeng*
15:05-15:25	Integrated Inventory Management, Supplier Selection, Disruption Risk Assessment Problem under Ripple Effect *Liu, Ming, Liu, Zhongzheng, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
15:25-15:45	Prepositioning of Emergency Supplies for Predictable Disasters Using Distributionally Robust Optimization *Li, Jing, Che, Ada, Chu, Feng*

15:45-16:05	Warehousing and Distribution Network Design from a Third-Party Logistics (3PL) Company Perspective *Karagiannis, Georgios, Minis, Ioannis, Arampantzi, Christina, Dikas, Georgios*

Circular Principles and Industry 4.0 Technologies for Supply Chain Management in Covid-19 Era

Fri. 14:45–16:25
Room I

14:45-15:05	Assessing Interactions between Lean Six-Sigma, Circular Economy and Industry 4.0: Toward an Integrated Perspective *Skalli, Dounia, Charkaoui, Abdelkabir, Cherrafi, Anass*
15:05-15:25	Implications of Implementing Industrial Symbiosis for Supply Chain Dynamics *Fussone, Rebecca, Dominguez, Roberto, Cannella, Salvatore, Framinan, Jose M*
15:25-15:45	Tracing and Measuring the COVID-19 Colombian Vaccination Network *Trujillo-Diaz, Johanna, Amaya, Ciro Alberto, Gonzalez-Uribe, Catalina, Hernández, Estefanía, Herrera, Andrea, Velasco, Nubia*

RS14-Transportation and Logistics, Home Health Care

Fri. 14:45–16:25
Room J

14:45-15:05	Mixed-Integer Linear Programming for Specialized Education and Home Care Services *Bou Saleh, Mira, Grunder, Olivier, Hajjam El Hassani, Amir*
15:05-15:25	Fairness in Home Healthcare: Can Patient-Centered and Nurse-Centered Measures Concur to the Same Goals? *Bonomi, Valentina, Mansini, Renata, Zanotti, Roberto*
15:25-15:45	Optimal Models for Autonomous Trucks and Drones Resupply for Last-Mile Delivery in Urban Areas *Yuan, Zhe, Herve, Simon*
15:45-16:05	Designing Reverse Logistics Network for a Case Study of Home-Care Health Medical Device Waste Management: Implications for Industry 4.0 Supply Chains *Sar, Kubra, Ghadimi, Pezhman*
16:05-16:25	Green VRP Applied to Home (Health)-Care Problem *Hadjtaieb, Salma, Hani, Yasmina, Loukil, Taicir, El Mhamedi, Abderrahman*

The Applications of Bayesian Networks in Manufacturing, Supply Chain, and Logistics

Fri. 14:45–16:25
Room KL

14:45-15:05	New MDP Model and Learning Algorithm for Bus Scheduling Problem with Conditional Signal Priority *Liu, Ming, Zhao, Yecheng, Chu, Feng, Zheng, Feifeng, Chu, Chengbin*
15:05-15:25	On the Emergency Water Distribution Problem: Optimizing Vehicle Routing with Deprivation Costs Considerations *Giedelmann lasprilla, Nicolás, Guerrero, William J., Solano-Charris, Elyn L.*
15:25-15:45	Machine Learning Models for Efficient Port Terminal Operations: Case of Vessels' Arrival Times Prediction *El Mekkaoui, Sara, Benabbou, Loubna, Berrado, Abdelaziz*
15:45-16:05	A Simulation-Optimization Approach for Solving the Forestry Logistics Problem *Sibdari, Soheil, Sepasi, Amir*

Dynamic Capabilities for Viable Digital Supply Chain Performance

Fri. 14:45–16:25
Room M

14:45-15:05	Cloud Architecture-Based Multi-Agent Platform for Matching in Resource Sharing *Liu, Shiming, Yazdani, Mohamad Amin, Hennequin, Sophie, Roy, Daniel*
15:05-15:25	Analyzing Capabilities for Resilient Supply Chain in Unexpected Event *Echefaj, Khadija, Charkaoui, Abdelkabir, Cherrafi, Anass*
15:25-15:45	Optimizing Food Ordering in a Multi-Stage Catering Supply Chain Network Using Reusable Containers *Ronzoni, Michele, Accorsi, Riccardo, Battarra, Ilaria, Guidani, Beatrice, Manzini, Riccardo, Rubini, Sara*

Reconfigurable Production System for Dynamic Manufacturing Environment

Fri. 14:45–16:25
Room N

14:45-15:05	Methodology for the Selection of S3 Solutions in Manufacturing Processes: Leak Test Study in the Automotive Sector *Cortés, Daniel, Ramirez, Jose, Gonzalez-de-Castilla, Emilio, Puente, Jaime, Molina, Arturo*
15:05-15:25	Multi-Level Approach to Virtual Commissioning: A Reconfigurable Assembly System Case *Schamp, Matthias, Demasure, Thibaut, Huysentruyt, Stijn, Lamote, Jan, Aghezzaf, El-Houssaine, Cottyn, Johannes*
15:25-15:45	Requirements for Reconfiguration Management for Manufacturing Systems *Caesar, Birte, Tilbury, Dawn M., Barton, Kira, Fay, Alexander*
15:45-16:05	From Automation Toward Integration of Process Planning: A State-Of-The-Art Review *Ameer, Muhammad, Dahane, Mohammed*

Machine Learning and IOT Applications (MALIOT-APPS '22)

Fri. 14:45–16:25
Room B317

14:45-15:05	Nowcasting and Forecasting GDP Growth Using Google Trends in Morocco *Bouayad, Imane, Zahir, Jihad, Ez-zetouni, Adil*
15:05-15:25	A Machine Learning Study to Enhance Project Cost Forecasting *İnan, Tolga, Narbaev, Timur, Hazir, Oncu*
15:25-15:45	Using GANs to Generate Lyric Videos *Nouzri, Sana, Gareev, Daniel, Glassl, Oliver*
15:45-16:05	Smart Irrigation System *El Mezouari, Asmae, Aziz, El Fazziki, Sadgal, Mohammed*
16:05-16:25	Automatic Detection of Humor and Irony *Al Mouatamid, Youssef, Choukry, Saad*

RS07-Blockchain

Fri. 14:45–16:25
Room B319

14:45-15:05	Implementation of Blockchain Technology to Enhance Last Mile Delivery Models with Sustainability Perspectives *Lobo, Carol, Wicaksono, Hendro, Fatahi Valilai, Omid*
15:05-15:25	The Potential of Blockchain Applications in Urban Industrial Symbiosis *Godina, Radu, Bruel, Aurélien, Neves, Angela, Matias, João*
15:25-15:45	A Private Blockchain Platform to Manage Data Exchange between Supply Chain Partners *Boubaker, Selmen, Dolatineghabadi, Parisa, Clement, Gael, Hamdaoui, Yassine, Boutaleb, Aissa*

Supply Chain and Logistics Networks under Pandemics Situations

Fri. 14:45–16:25
Room B320

14:45-15:05	Agent-Based Simulation for Vaccination Networks Design and Analysis: Preliminary Gaps *Piffari, Claudia, Lagorio, Alexandra, Pinto, Roberto*
15:05-15:25	Transformation of Robotics Education in the Era of Covid-19: Challenges and Opportunities *Christopoulos, Athanasios, Coppo, Guido, Andolina, Salvatore, Lo Priore, Simone, Antonelli, Dario, Salmas, Dimitrios, Stylios, Chrysostomos, Mikko-Jussi, Laakso*
15:25-15:45	A Decision Support System to Reorganize Medical Service Network in Pandemic *Sajjad, Ahadian, Pishvaee, Mir Saman, Jahani, Hamed*
15:45-16:05	A Vehicle Routing Problem with Time Windows and Workload Balancing for COVID-19 Testers: A Case Study *Shahnejat-Bushehri, Sina, Kermani, Ali, Arslan, Okan, Cordeau, Jean-François, Jans, Raf*
16:05-16:25	Reverse Supply Chain Network with Return Products Quality Consideration *Ebrahimi Bajgani, Sahar, Saberi, Sara, Toyasaki, Fuminori*

Risk and Resilience in the Era of Industry 4.0

Fri. 14:45–16:25
Room B

14:45-15:05	Contributions of Industry 4.0 to Resilience Achievement in the Context of COVID-19 Pandemic *Said, Saloua, Bouloiz, Hafida, Maryam, Gallab*
15:05-15:25	Towards the Ethical Awareness Integration on Industrial Performance Management Systems *Jimenez, Jose Fernando, Berrah, Lamia, Trentesaux, Damien, Chapel, Claude*
15:25-15:45	Estimation of Risk Contingency Budget in Projects Using Machine Learning *Capone, Christian, Narbaev, Timur*
15:45-16:05	A Bi-Objective Model for the Cloud Manufacturing Configuration Design with Resilience and Disruption Risks *Arbabi, Hamidreza, Bozorgi-Amiri, Ali, Tavakkoli-Moghaddam, Reza, Rohaninezhad, Mohammad*

From Document-Based to Data and AI-Based through Model-Based System Engineering: Challenges and Issues, Works and Results, Perspectives

Fri. 14:45–16:25
Room C

14:45-15:05	Document to Model Transition for Architecture Evaluation Approach: Application to a Nuclear Infrastructure Project *Bourdon, Jérémy, Couturier, Pierre, Chapurlat, Vincent, Plana, Robert, Richet, Victor, Baudouin, Benjamin*
15:05-15:25	Digital Twin for Services (DT4S): Conceptual Strategy *Rabah, Souad, Zacharewicz, Gregory, Chapurlat, Vincent*
15:25-15:45	An Original Data, Information and Knowledge Management Approach for Model-Based Engineering Projects *El Alaoui, Mouna, Rabah, Souad, Chapurlat, Vincent, Richet, Victor, Plana, Robert*
15:45-16:05	Deep Learning Based Crack Growth Analysis for Structural Health Monitoring *Chambon, Aurélien, Bellaouchou, Anas, Atamuradov, Vepa, Vitillo, Francesco, Plana, Robert*
16:05-16:25	Requirements Verification and Validation in Systems Engineering: A Systematic Literature Review *Masmoudi, Chedhli, Marange, Pascale, Bonjour, Eric, Levrat, Eric, Kerbrat, Alain*

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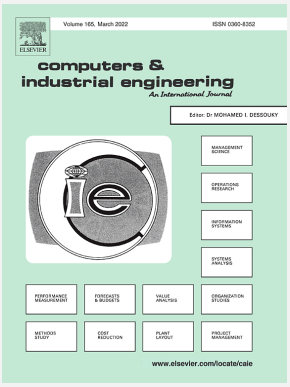

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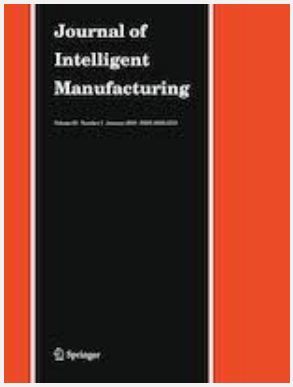

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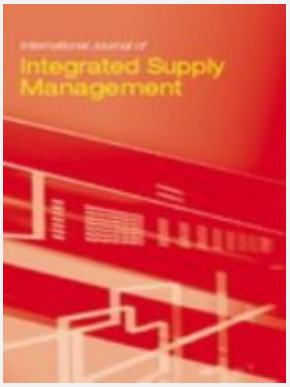

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