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Advances in Production Management Systems. Artificial Intelligence for Sustainable and Resilient Production Systems. Part III

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David Romero

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IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

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David Lemoine · Gregor von Cieminski ·
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Advances in Production Management Systems


Artificial Intelligence for Sustainable
and Resilient Production Systems


IFIP WG 5.7 International Conference, APMS 2021
Nantes, France, September 5–9, 2021
Proceedings, Part III


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Preface

The scientific and industrial relevance of the development of sustainable and resilient production systems lies in ensuring future-proof manufacturing and service systems, including their supply chains and logistics networks. “Sustainability” and “Resilience” are essential requirements for competitive manufacturing and service provisioning now and in the future. Industry 4.0 technologies, such as artificial intelligence; decision aid models; additive and hybrid manufacturing; augmented, virtual, and mixed reality; industrial, collaborative, mobile, and software robots; advanced simulations and digital twins; and smart sensors and intelligent industrial networks, are key enablers for building new digital and smart capabilities in emerging cyber-physical production systems in support of more efficient and effective operations planning and control. These allow manufacturers and service providers to explore more sustainable and resilient business and operating models. By making innovative use of the aforementioned technologies and their enabled capabilities, they can pursue the triple bottom line of economic, environmental, and social sustainability. Furthermore, industrial companies will be able to withstand and quickly recover from disruptions that pose threats to their operational continuity. This is in the face of disrupted, complex, turbulent, and uncertain business environments, like the one triggered by the COVID-19 pandemic, or environmental pressures calling for decoupling economic growth from resource use and emissions.

The International Conference on Advances in Production Management Systems 2021 (APMS 2021) in Nantes, France, brought together leading international experts on manufacturing, service, supply, and logistics systems from academia, industry, and government to discuss pressing issues and research opportunities mostly in smart manufacturing and cyber-physical production systems; service systems design, engineering, and management; digital lean operations management; and resilient supply chain management in the Industry 4.0 era, with particular focus on artificial intelligence-enabled solutions.

Under the influence of the COVID-19 pandemic, the event was organised as online conference sessions. A large international panel of experts (497 from 50 countries) reviewed all the submissions (with an average of 3.2 reviews per paper) and selected the best 377 papers (70% of the submitted contributions) to be included in these international conference proceedings. The topics of interest at APMS 2021 included artificial intelligence techniques, decision aid, and new and renewed paradigms for sustainable and resilient production systems at four-wall factory and value chain levels, comprising their associated models, frameworks, methods, tools, and technologies for smart and sustainable manufacturing and service systems, as well as resilient digital supply chains. As usual for the APMS conference, the Program Committee was particularly attentive to the cutting-edge problems in production management and the quality of the papers, especially with regard to the applicability of the contributions to industry and services.

The APMS 2021 conference proceedings are organized into five volumes covering a large spectre of research concerning the global topic of the conference: “Artificial Intelligence for Sustainable and Resilient Production Systems”.

The conference was supported by the International Federation of Information Processing (IFIP), which is celebrating its 60th Anniversary, and was co-organized by the IFIP Working Group 5.7 on Advances in Production Management Systems, IMT Atlantique (Campus Nantes) as well as the Centrale Nantes, University of Nantes, Rennes Business School, and Audecia Business School. It was also supported by three leading journals in the discipline: Production Planning & Control (PPC), the International Journal of Production Research (IJPR), and the International Journal of Product Lifecycle Management (IJPLM).

Special attention has been given to the International Journal of Production Research on the occasion of its 60th Anniversary. Since its foundation in 1961, IJPR has become one of the flagship journals of our profession. It was the first international journal to bring together papers on all aspects of production research: product/process engineering, production system design and management, operations management, and logistics. Many exceptional scientific results have been published in the journal.

We would like to thank all contributing authors for their high-quality work and for their willingness to share their research findings with the APMS community. We are also grateful to the members of the IFIP Working Group 5.7, the Program Committee, and the Scientific Committee, along with the Special Sessions organizers for their support in the organization of the conference program. Concerning the number of papers, special thanks must be given to the local colleagues who managed the reviewing process as well as the preparation of the conference program and proceedings, particularly Hicham Haddou Benderbal and Maria-Isabel Estrepo-Ruiz from IMT Atlantique.

September 2021

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Jelusic Elena	Lee Kangbok
Jeong Yongkuk	Lee Kyungsik
Johansen John	Lee Minchul

Lee Seokcheon
Lee Seokgi
Lee Young Hoon
Lehuédé Fabien
Leiber Daria
Lemoine David
Li Haijiao
Li Yuanfu
Lim Dae-Eun
Lim Ming
Lima Adalberto da
Lima Nilsa
Lin Chen-ju
Linares Jean-marc
Linnartz Maria
Listl Franz Georg
Liu Ming
Liu Xin
Liu Zhongzheng
Lödding Hermann
Lodgaard Eirin
Loger Benoit
Lorenz Rafael
Lu Jinzhi
Lu Xingwei
Lu Xuefei
Lucas Flavien
Lüftenegger Egon
Luo Dan
Ma Junhai
Macchi Marco
Machado Bruno Abner
Maier Janine Tatjana
Maihami Reza
Makboul Salma
Makris Sotiris
Malaguti Roney Camargo
Mandal Jasashwi
Mandel Alexander
Manier Hervé
Manier Marie-Ange
Marangé Pascale
Marchesano Maria Grazia
Marek Svenja
Marjanovic Ugljesa
Marmolejo Jose Antonio
Marques Melissa
Marrazzini Leonardo
Masone Adriano
Massonnet Guillaume
Matsuda Michiko
Maxwell Duncan William
Mazzuto Giovanni
Medić Nenad
Medini Khaled
Mehnen Jorn
Mendes dos Reis João Gilberto
Mentzas Gregoris
Metaxa Ifigeneia
Min Li Li
Minner Stefan
Mishra Ashutosh
Mitra Rony
Mizuyama Hajime
Mogale Dnyaneshwar
Mohammadi Mehrdad
Mollo Neto Mario
Montini Elias
Montoya-Torres Jairo R.
Moon Ilkyeong
Moraes Thais De Castro
Morinaga Eiji
Moser Benedikt
Moshref-Javadi Mohammad
Mourtzis Dimitris
Mundt Christopher
Muši Denis
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Nakade Koichi
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Napoleone Alessia
Nayak Ashutosh
Neroni Mattia
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Neubert Gilles
Nguyen Du Huu
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Nguyen Thi Hien
Nielsen Izabela
Nielsen Kjeld
Nishi Tatsushi

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Noh Sang Do
Nonaka Tomomi
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Ouazene Yassine
Ouzrout Yacine
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Panigrahi Swayam Sampurna
Papakostas Nikolaos
Papcun Peter
Pashkevich Anatol
Pattnaik Monalisha
Pels Henk Jan
Pérès François
Persson Fredrik
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Phan Dinh Anh
Piétrac Laurent
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Pirola Fabiana
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Prabhu Vittaldas
Psarommatis Foivos
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Rapaccini Mario
Reis Milena Estanislau Diniz Dos
Resanovic Daniel
Rey David
Riedel Ralph
Rikalović Aleksandar
Rinaldi Marta
Roda Irene
Rodriguez Aguilar Roman
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Romero David
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Santarek Kszysztof
Satolo Eduardo Guilherme
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Schneider Daniel
Semolić Brane
Shafiq Muhammad
Sharma Rohit
Shin Jong-Ho
Shukla Mayank
Shunk Dan
Siadat Ali
Silva Cristovao
Singgih Ivan Kristianto
Singh Sube
Slama Ilhem
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Softic Selver
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Soleilhac Gauthier
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Song Xiaoxiao
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Stoll Oliver
Strandhagen Jan Ola
Suh Eun Suk
Suleykin Alexander
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Szirbik Nick B.
Taghvaeipour Afshin

Taisch Marco
Tanimizu Yoshitaka
Tanizaki Takashi
Tasić Nemanja
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Telles Renato
Thevenin Simon
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Vaz Paulo
Vespoli Silvestro
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Villeneuve Eric
Viviani Jean-Laurent
Vještica Marko
Vo Thi Le Hoa
Voisin Alexandre
von Cieminski Gregor
Von Stietencron Moritz
Wagner Sarah
Wang Congke
Wang Hongfeng
Wang Yin
Wang Yingli
Wang Yuling
Wang Zhaojie
Wang Zhixin
Wellsandt Stefan
West Shaun
Wiendahl Hans-Hermann
Wiesner Stefan Alexander
Wikner Joakim
Wiktorsson Magnus
Wimmer Manuel
Woo Young-Bin
Wortmann Andreas
Wortmann Johan Casper
Wuest Thorsten
Xu Tiantong
Yadegari Ehsan
Yalaoui Alice
Yang Danqin
Yang Guoqing
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Zeba Gordana
Zhang Guoqing
Zhang Ruiyou
Zheng Feifeng
Zheng Xiaochen
Zoitl Alois
Zolotová Iveta
Zouggar Anne

Contents – Part III

Autonomous Robots in Delivery Logistics

Sustainable Facility Location-Routing Problem for Blood Package Delivery by Drones with a Charging Station	3
<i>Shirin Ghasemi, Reza Tavakkoli-Moghaddam, Mahdi Hamid, and Meysam Hosseinzadeh</i>	
A MILP Formulation for an Automated Guided Vehicle Scheduling Problem with Battery Constraints	15
<i>Adriano Masone, Teresa Murino, Claudio Sterle, and Monica Strazzullo</i>	
Planning Autonomous Material Transportation in Hospitals	24
<i>Giuseppe Fragapane, Debjit Roy, Fabio Sgarbossa, and Jan Ola Strandhagen</i>	
Collaborative Hybrid Delivery System: Drone Routing Problem Assisted by Truck	33
<i>Ho Young Jeong and Seokcheon Lee</i>	
Drone Delivery Vehicle Routing Problem with Multi-flight Level	43
<i>Yonggab Kim, Hoyoung Jung, and Seokcheon Lee</i>	

Digital Transformation Approaches in Production Management

Multi-perspective View on Sustainable Production: A Literature Review	55
<i>Marko Samardzic and Ugljesa Marjanovic</i>	
Determining Minimal Cost of Action for Task Allocation Within Mobile Robot Swarm in Production Environments	64
<i>Elmir Babović, Denis Mušić, Bahrudin Hrnjica, and Adil Joldić</i>	
A Hybrid Architecture for the Deployment of a Data Quality Management (DQM) System for Zero-Defect Manufacturing in Industry 4.0	71
<i>Chiara Caccamo, Ragnhild Eleftheriadis, Maria Chiara Magnanini, Daryl Powell, and Odd Myklebust</i>	
The Survival Analysis for a Predictive Maintenance in Manufacturing	78
<i>Bahrudin Hrnjica and Selver Softic</i>	
Detection of Fluid Level in Bores for Batch Size One Assembly Automation Using Convolutional Neural Network	86
<i>Alexej Simeth, Jessica Plaßmann, and Peter Plapper</i>	

Barriers Hindering an Efficient Implementation Process of Digital Technologies; a Case Study at Norwegian Manufacturing Companies	94
<i>Eirin Lodgaard, Hans Torvatn, Johanne Sørumsbrenden, and Gaute Andreas Knutstad</i>	
Consistent Maintenance Order Processing with Digital Assistance Systems	102
<i>Robert Rost and Axel Friedewald</i>	
Supporting Manufacturing Processes Design Using Stakeholder Opinions and Sentiment Analysis	112
<i>Egon Lüftenegger and Selver Softic</i>	
Digitalization in Manufacturing: Trends, Drivers, Challenges, and Research Areas in Norway.	118
<i>Emrah Arica and Daryl Powell</i>	
Exploring Accidental Digital Servitization in an Industrial Context	126
<i>Matthew Anderson, Shaun West, and David Harrison</i>	
Finance-Driven Supply Chain	
Financing and Cost Sharing for a Supply Chain Under CSR - Sensitive Demand	139
<i>Franck Moraux, Dinh Anh Phan, and Thi Le Hoa Vo</i>	
Integrated Business Planning Process: Link Between Supply Chain Planning and Financial Planning	149
<i>Mohamed Haythem Selmi, Zied Jemai, Laurent Gregoire, and Yves Dallery</i>	
An EOQ-Based Lot Sizing Model with Working Capital Requirements Financing Cost	159
<i>Yuan Bian, David Lemoine, Thomas G. Yeung, Nathalie Bostel, Vincent Hovelaque, and Jean-Laurent Viviani</i>	
Put Option Contracts in Newsvendor Model with Bankruptcy Risk	167
<i>Pooya Hedayatinia, David Lemoine, Guillaume Massonnet, and Jean-Laurent Viviani</i>	
Pricing Decisions for an Omnichannel Retailing Under Service Level Considerations	175
<i>Minh Tam Tran, Yacine Rekik, and Khaled Hadj-Hamou</i>	

Gastronomic Service System Design

Forecasting the Number of Customers Visiting Restaurants Using Machine Learning and Statistical Method	189
<i>Takashi Tanizaki, Shunsuke Kozuma, and Takeshi Shimmura</i>	
Digital Ordering Improves Labor Productivity in Multiproduct Restaurants. . .	198
<i>Takeshi Shimmura and Syuichi Oura</i>	
Geospatial Intelligence for Health and Productivity Management in Japanese Restaurants and Other Industries	206
<i>Takeshi Kurata</i>	
Engineering Large Event Catering Services	215
<i>Kai-Wen Tien and Vittaldas V. Prabhu</i>	
A Study on Menu Planning Method Considering the Variation in Menu Orders - Application to Daily Foods in a Company Cafeteria	224
<i>Ruriko Watanabe, Nobutada Fujii, Daisuke Kokuryo, Toshiya Kaihara, Kyohei Irie, Kenji Yanagita, and Kenichi Harada</i>	
Systems Engineering Analysis for Cooking Recipes from the Perspective of Work Instructions	232
<i>Tomomi Nonaka, Kaoru Kamatani, and Nobutada Fujii</i>	

Modern Scheduling and Applications in Industry 4.0

Electric Bus Charging Scheduling Strategy with Stochastic Arrival Time and State of Charge.	241
<i>Ming Liu, Yueyu Ding, Feng Chu, Feifeng Zheng, and Chengbin Chu</i>	
Group Scheduling and Due Date Assignment Without Restriction on a Single Machine	250
<i>Ying Chen and Yongxi Cheng</i>	
Parallel Machine Scheduling with Stochastic Workforce Skill Requirements.	258
<i>Xin Liu and Ming Liu</i>	
Multitasking Scheduling Problem with Uncertain Credit Risk	266
<i>Feifeng Zheng, Zhaojie Wang, Yinfeng Xu, and Ming Liu</i>	
A Mathematical Model for Bus Scheduling with Conditional Signal Priority	274
<i>Ming Liu, Yecheng Zhao, Feng Chu, Feifeng Zheng, and Chengbin Chu</i>	
Charging Scheduling Optimization of Battery Electric Bus with Controllable Task Completion.	282
<i>Feifeng Zheng, Zhixin Wang, Yinfeng Xu, and Ming Liu</i>	

Research on the O2O Takeout Orders Merger and Routing Optimization 290
Wenjie Wang, Xue Xia, Lei Xie, Li Jiang, and Yangyun Song

A MILP Model for the Scheduling of a Multiproduct Tree-Structure Pipeline Network in Mining Industry 299
M. Bamoumen, S. Elfirdoussi, L. Ren, and N. Tchernev

Exploiting the Full Potential of I4.0 Technologies for Products EOL Recovery Process 307
Valentina Popolo, Mose Gallo, Andrea Grassi, and Maria Grazia Marchesano

An Approximation Algorithm for the k-Connected Location Set Cover Problem with Color-Spanning Constraint 317
Yin Wang and Yinfeng Xu

Recent Advances in Sustainable Manufacturing

Sustainable Process Plan Generation in RMS: A Comparative Study of Two Multi-objective Evolutionary Approaches 329
Imen Khettabi, Lyes Benyoucef, and Mohamed Amine Boutiche

How Is Value Created in the Circular Economy? Evidence from Remanufacturing and Repair Businesses. 340
Melissa Correa Marques, Umit Sezer Bititci, and Amos Peter Haniff

Modeling the Parallel Machine Scheduling Problem with Worker- and Position-Dependent Processing Times 351
Jairo R. Montoya-Torres, Valérie Botta-Genoulaz, Nick Materzok, Borgeir Páll Gislason, and Sélène Mendiela

The Most Critical Decisions in Manufacturing: Implications for a Circular Economy 360
Nina Pereira Kvadsheim, Bella B. Nujen, and Deodat Mwesiumo

Challenges in Setting up a Production Line During Pandemic. 369
Kiwook Jung, Scott Nieman, and Boonserm Kulvatunyou

Green Production and Circularity Concepts

Developing a Qualitative Maturity Scale for Circularity in Manufacturing 377
Federica Acerbi, Vafa Järnefelt, Jorge Tiago Martins, Leila Saari, Katri Valkokari, and Marco Taisch

Business Models in Circular Economy: A Systematic Literature Review 386
Beatrice Colombo, Paolo Gaiardelli, Stefano Dotti, and Albachiara Boffelli

Industry 4.0 Driven Quantitative Methods for Circular Supply Chains: A Bibliometric Analysis.	394
<i>Biman Darshana Hettiarachchi, Stefan Seuring, and Marcus Brandenburg</i>	
Rethinking Circular Business Models: The Role of the Learning Factory	402
<i>Maria Flavia Mogos, Sigurd Sagen Vildåsen, Johanne Sørumsbrenden, and Daryl Powell</i>	
Crop Selection and Scheduling for Green Production with Intercropping and Rotation.	411
<i>Canan Pehlivan, Thomas G. Yeung, and Aline Suzette Alvarado Munguia</i>	
Improvement Models and Methods for Green and Innovative Systems	
Generation Y – Modularity Enabling Radical Innovation	423
<i>Bjørnar Henriksen and Carl Christian Røstad</i>	
Disassembly Line Balancing Using Recursive Optimization in Presence of Task-Failure	430
<i>Rakshit Kumar Singh, Amit Raj Singh, and Ravindra Kumar Yadav</i>	
Quantity-Flexibility Contract Models for the Supply Chain with Green-Sensitive Demand in the Automotive Manufacturing Industry . . .	441
<i>Zhe Yuan, Yeming Gong, and Mingyang Chen</i>	
How Much Green Investments Are Efficient for a Smart Production System?.	450
<i>Rekha Guchhait, Mitali Sarkar, and Biswajit Sarkar</i>	
Demand Driven Material Requirements Planning Buffer Positioning Considering Carbon Emissions	460
<i>Achergui Abdelhalim, Allaoui Hamid, and Hsu Tiente</i>	
Supply Chain and Routing Management	
Reinforcement Learning for Layout Planning – Modelling the Layout Problem as MDP	471
<i>Hendrik Unger and Frank Börner</i>	
Supply Chain Management by Blockchain	480
<i>Gianfranco Genta, Agostino Villa, and Gianni Piero Perrone</i>	

Optimization of Hierarchical Production Planning with Setup Time Feasibility for Effective Supply Chain Management.	489
<i>Guisen Xue and O. Felix Offodile</i>	
Integrated Planning of IoT-Based Smart Bin Allocation and Vehicle Routing in Solid Waste Management.	499
<i>Arindam Roy, Apurba Manna, Jungmin Kim, and Ilkyeong Moon</i>	
Smart Contracts Implementation in the Allocation of Covid-19 Vaccines	510
<i>Mohammad Amin Yazdani, Daniel Roy, and Sophie Hennequin</i>	
Robotics and Human Aspects	
Methods of Forecasting Environmental Stress and Strain on Working Humans in the Digital Factory	523
<i>Gert Zülch</i>	
Paraconsistent Annotated Evidential Logic E Applied to Autonomous Robots in Logistic Center.	533
<i>Flávio Amadeu Bernardini, Marcia Terra da Silva, Jair Minoro Abe, and Luiz Antonio de Lima</i>	
Human Aspects in Collaborative Order Picking – What if Robots Learned How to Give Humans a Break?	541
<i>Yaxu Niu and Frederik Schulte</i>	
Assembly System 4.0: Human-Robot Collaboration in Assembly Operations	551
<i>Gursel A. Suer, Najat Almasarwah, Jesus Pagan, and Yuqiu You</i>	
An Integrated QFD Approach for Industrial Robot Selection	561
<i>Gülçin Büyükoçkan, Öykü Ilıcak, and Orhan Feyzioğlu</i>	
Classification and Data Management Methods	
Dissimilarity to Class Medoids as Features for 3D Point Cloud Classification	573
<i>Sylvain Chabanet, Valentin Chazelle, Philippe Thomas, and Hind Bril El-Haouzi</i>	
A Comparative Study of Classification Methods on the States of the USA Based on COVID-19 Indicators	582
<i>İbrahim Miraç Eligüzel and Eren Özceylan</i>	
Maintenance Data Management for Condition-Based Maintenance Implementation	591
<i>Humberto Teixeira, Catarina Teixeira, and Isabel Lopes</i>	

A Machine Learning Based Health Indicator Construction in Implementing Predictive Maintenance: A Real World Industrial Application from Manufacturing	599
<i>Harshad Kurrewar, Ebru Turanoglu Bekar, Anders Skoogh, and Per Nyqvist</i>	

Development of Convolutional Neural Network Architecture for Detecting Dangerous Goods for X-ray Aviation Security in Artificial Intelligence	609
<i>Woong Kim and Chulung Lee</i>	

Smart Supply Chain and Production in Society 5.0 Era

Coalition Analysis on Two Manufactures and Two Retailers Supply Chain via Cooperative Game Theory	619
<i>Taiki Saso and Tatsushi Nishi</i>	

Supply Chain Optimization Through Cooperative Negotiation by Using Backward Scheduling	629
<i>Yoshitaka Tanimizu and Rika Kanbara</i>	

A Proposal of Scheduling Method Based on Decision Criteria Considering Electric Power Costs and Productivity	637
<i>Masayuki Yabuuchi, Toshiya Kaihara, Nobutada Fujii, Daisuke Kokuryo, Mio Nonaka, and Kotone Senju</i>	

A New Representation and Adaptive Feature Selection for Evolving Compact Dispatching Rules for Dynamic Job Shop Scheduling with Genetic Programming	646
<i>Salama Shady, Toshiya Kaihara, Nobutada Fujii, and Daisuke Kokuryo</i>	

A Study on Sharing Logistics Network Design Considering Demand Uncertainty	655
<i>Asumi Ito, Toshiya Kaihara, Daisuke Kokuryo, and Nobutada Fujii</i>	

Reshaping the Supply Chain for Society 5.0.	663
<i>Rosanna Fornasiero and Andrea Zangiacomi</i>	

Supply Chain Risk Management Under Coronavirus

A Tabu Search Heuristic for the Robust Dynamic Bayesian Network Optimisation Problem Under the Supply Chain Ripple Effect	673
<i>Ming Liu, Hao Tang, Feng Chu, Feifeng Zheng, and Chengbin Chu</i>	

A New Robust Dynamic Bayesian Network Model with Bounded Deviation Budget for Disruption Risk Evaluation	681
<i>Ming Liu, Tao Lin, Feng Chu, Feifeng Zheng, and Chengbin Chu</i>	

Stochastic Integrated Supplier Selection and Disruption Risk Assessment Under Ripple Effect 689
Ming Liu, Zhongzheng Liu, Feng Chu, Feifeng Zheng, and Chengbin Chu

Pharmaceutical Supply Chain Risk Assessment in the Time of COVID 19/Case Study..... 697
Jihene Jlassi, Nesrin Halouani, and Abderrahman El Mhamedi

Author Index 705