



东海大学
TUNGHAI UNIVERSITY

26TH ICPR 2021

International Conference
on Production Research

International Foundation for Product Research

**Virtual Conference
Programme**

July 18-21, 2021

Tunghai University

ICPR 26 (2021) in Taichung, Taiwan

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Welcome

When I recalled the 25th ICPR in Chicago in 2019, I invited everyone to participate in the 26th ICPR in Taichung, Taiwan in 2021. At that time, I did not prepare myself to accept the conference to be held in such a state. Back to the original plan, we should hold the ICPR in a luxury hotel in Taichung. We should hug each other cheerfully. We should have plant tours in Giant Bicycle Museum, semiconductor factories, and machine tool factories. Everyone should have various tours to the famous scenic spots in Taiwan such as Sun Moon Lake and Alishan. Unfortunately, let's stop the dream here. Even though we have to look at so many miserable stories around us, at this pandemic moment, I encourage you to cheer up in the 26th ICPR, because we have each other.

For the 26th ICPR we have more than 240 abstracts and 180 full-paper submissions. Scholars are from more than 30 countries. The theme of the conference, Intelligent and Transformative Production in Pandemic Times, has attracted many related papers.

I especially would like to thank my colleagues and students for preparing and helping the conference. I thank the five plenary speakers for accepting the invitations to deliver the wisdom knowledge to the audience. All the invited reviewers are appreciated for their professional advises to the papers. Their contribution has greatly improved the quality of the conference papers. I would like to thank the IFPR board members for accepting and support this conference since four years ago in Poznan, Poland. Most importantly, I thank each participant for joining this extraordinary conference in Taiwan. Please make ICPR your must-participate conference just like many of us do.

In particular, I want to thank Luis Quezada (President of IFPR), Anthony Chiu (Secretary General of IFPR), Daniela Popescu (Deputy Secretary of IFPR), and Rob Dekkers (Chair of IFPR Doctoral Workshop). They devoted themselves so much in organizing the conference.

Thanks also go to CIEE (Taiwan's Industrial Engineering Society) for the technical support, and Ministry of Science and Technology of Taiwan for the financial support.

My colleagues, please remember that you have a rain check for Taiwan travel. I and my team sincerely invite you to visit Tunghai University, Taichung City, and Taiwan in the near future.

A handwritten signature in black ink, reading "Chin-Yin Huang". The signature is written in a cursive, flowing style.

Chin-Yin Huang
Conference Chair of the 26th ICPR



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Keynote Speakers Profiles

Shimon Y. Nof, Ph.D.

PRISM Center & School of IE, Purdue University

Presentation Title: Challenges and Contributions to Intelligent and Transformative Production Before, During, and Beyond Pandemic Times

Shimon Y. Nof, Professor, Ph.D., D.H.C. is a professor of Industrial Engineering and also the director of the NSF-industry supported PRISM Center (Production, Robotics and Integration Software for Manufacturing & Management), Purdue University. Has held visiting positions at MIT, and universities in Chile, EU, Hong Kong, Israel, Japan, Mexico, Philippines and Taiwan. Received his B.Sc. and M.Sc. in Industrial Engineering & Management (Human-Machine Systems), Technion, Haifa, Israel; Ph.D. in Industrial & Operations Engineering (Production Analytics), University of Michigan, Ann Arbor.



Oliver Riedel, Ph.D.

Fraunhofer Institute for Industrial Engineering IAO

Presentation Title: Smart and resilient manufacturing as answer to pandemic effects on manufacturing economy

Prof. Oliver Riedel has been involved with the basic principles and practical application of virtual validation methods in product development and production for over 20 years. During this time, he has managed numerous projects for major international companies in the automotive and energy industries with the objective of introducing virtual methods. In November 2016 he was appointed Professor at the University of Stuttgart and is managing director of the Institute for Control Engineering of Machine Tools and Manufacturing Units, holds the chair for Information Technology in Production and is member of the management team and Director at the Fraunhofer IAO.



Alexandre Dolgui, Ph.D.

IMT Atlantique, France

Presentation Title: History and current state of the IJPR

Alexandre Dolgui is a Fellow of IISE, Distinguished Professor and Head of Department at the IMT Atlantique, France. His research focuses on manufacturing line design, production planning and supply chain optimization under uncertainty. He is the co-author of 5, co-editor of 20 books, he published 265 refereed journal papers, 30 editorials and 32 book chapters as well as over 400 papers in conference proceedings. He is the Editor in Chief of the International Journal of Production Research.



Keynote Speakers Profiles

Kenichi Funaki, Dr. Engineering

Corporate Venturing Office, Hitachi Ltd.

Presentation Title: How to create business in the age of Experience Economy – Let's do research on Experience production!

Kenichi Funaki has been engaged in open innovation strategy and practice more than a decade with various types of collaboration including joint research with universities and institutes, co-creation program with world-class leading companies, and joint business development with startups with innovative ideas. Besides, Funaki has over 20 years of experience in developing production, asset management, logistics and supply chain management systems with BPR, and has worked with customers in high-tech industries, machinery industries including automobile and precision machinery industries as well as retail industries.



Morris Fan, Ph.D

Department of Industrial Engineering and Management, Taipei Tech.

Presentation Title: Assisted Intelligence (AI) Applications in Taiwan

Dr. Morris Fan is a professor in the Department of Industrial Engineering and Management, National Taipei University of Taiwan. He now serves as the Vice President and Board Member of Asia Pacific Industrial Engineering and Management Society (APIEMS). He now serves a Convener of Industrial Engineering & Management Program, Department of Engineering & Technologies, Ministry of Science & Technology (MOST), Taiwan. He now serves an Editor-in-Chief of Engineering Optimization published by Taylor & Francis since 2020.



General Programme

all in *Taipei time*

July 14-18 (Wed.-Sunday)

Early Career Researchers and Doctoral Training Programme

Chairman: Rob Dekkers

Saturday, July 17, 2021

7:00 PM IFPR Executive Board (invitation only)

Sunday, July 18, 2021

7:00 PM IFPR Board (invitation only)

Monday, July 19, 2021

7:00 PM - 8:30 PM **Opening Ceremony**
Keynote Speech 1: Shimon Y. Nof (Purdue University)
*Challenges and Contributions to Intelligent and Transformative
Production Before, During, and Beyond Pandemic Times*

8:30 PM - 9:30 PM **Keynote Speech 2:** Alexandre Dolgui, Ph.D. (IMT Atlantique)
History and current state of the IJPR

9:30 PM - 10:30 PM **Parallel Technical Sessions**

10:30 PM - 10:40 PM Chat Time

10:40PM - 11:40 PM **Parallel Technical Sessions**

Tuesday, July 20, 2021

- 7:00 PM - 8:30 PM** Editorial Forum , Chair: Dr. Rob Dekkers
- 8:30 PM - 9:30 PM** **Keynote Speech 3:** Oliver Riedel, Ph.D. (Fraunhofer Institute for Industrial Engineering IAO)
Smart and resilient manufacturing as answer to pandemic effects on manufacturing economy
- 9:30 PM - 10:30 PM** **IFPR Women in Production Research Forum**
- 9:30 PM - 10:30 PM** **Parallel Technical Sessions**
- 10:30 PM - 10:40 PM** Chat Time
- 10:40PM - 11:40 PM** **Parallel Technical Sessions**

Wednesday, July 21, 2021

- 7:00 PM - 8:00 PM** **Keynote Speech 4:** Kenichi Funaki, Dr. Engineering (Hitachi Ltd.)
How to create business in the age of Experience Economy – Let's do research on Experience production!
- 8:00 PM - 9:30 PM** **Conference Closing Ceremony**
Keynote Speech 5: Morris Fan, Ph.D (Taipei Tech.)
Assisted Intelligence (AI) Applications in Taiwan
- 9:30 PM - 10:00 PM** **Chat Time**
- 10:00 PM- 11:30 PM** **Parallel Technical Sessions**

To know your local time, please check <https://www.timeanddate.com/worldclock/>

Parallel Technical Sessions

Symbol	Description
DC	Digital and Cyber Manufacturing and Services
FW	IFPR Women in Production Research Forum
HF	Human Factors Engineering
HM	Healthcare Management
IE	Industrial Engineering and Operations Research
IP	Impact of the Pandemic on Industry and Production
IT	Internet of Things, Data Analytics and Smart Manufacturing
LE	Logistics Engineering and Management
MS	Manufacturing: System & Automation
NP	New Product Development and Innovation Management
PT	Production Tutorial
PR	PRISM30
QE	Quality Engineering and Management
SC	Smart City
SM	Supply Chain Management
SP	Sustainable Production

Monday, July 19, 2021

9:30 PM - 10:30 PM

Session	19101	19102	19103	19104	19105	19106	19107	19108	19109	19110
	IP	SM	SM	MS	IT	IE	SP		PR	NP

10:40PM 11:40 PM

Session	19201	19202	19203	19204	19205	19206	19207	19208	19209	19210
	IP	SM		MS	IT	IE	SP		PR	NP

Tuesday, July 20, 2021

9:30 PM 10:30 PM

Session	20101	20102	20103	20104	20105	20106	20107	20108	20109	20110
	IP	SM	LE	MS	IT	IE	SP	FW	QE	NP

10:40PM 11:40 PM

Session	20201	20202	20203	20204	20205	20206	20207	20208	20209	20210
	IP	SM	LE		DC	IE	HM	PT	QE	

Wednesday, July 21, 2021

10:00 PM 11:30 PM

Session	21101	21102	21103	21104	21105	21106	21107	21108	21109	21110
	IE	SM	SC	MS	DC	IE	HM		HF	NP

Monday, July 19, 2021

9:30 PM ~ 10:30 PM

Session **19101**

Chair: Ryosuke Nakajima, Tetsuo Yamada, Masayuki Matsu

Impact of the Pandemic on Industry and Production (IP)

9:30	0029	Development of Training System for Appearance Inspection Using Motion Capture and Large Size Display	Ryosuke Nakajima	The University of Electro-Communications, Japan
9:45	0093	Worker Organization System for Collaborative Crowdsourcing	Ryota Yamamoto	The University of Electro-Communications, Japan
10:00	0110	Identifying Factors Related with Occupational Satisfaction of Health-Care Workers	Yating Yu	Kitami Institute of Technology, Japan
10:15	0140	Matrix Approach and Scheduling for Cooperation Requirement Planning in Industrial Robots	Tomohiro Nakada	Daiichi Institute of Technology, Japan

Session **19102**

Chair: Ou Tang

Supply Chain Management (SM)

9:30	0007	Quantitative Evaluation of the Information Network in Supply Chain	Nobuaki Ishii	Kanagawa University, Japan
9:45	0010	An Integrated Approach for Resilient Value Creation Among the Lifecycle: Using the Automotive Industry as An Example	Florian Herrmann	Fraunhofer Institute for Industrial Engineering IAO, Germany
10:00	0039	A Multi-Period Optimization Stochastic Programming Model for Electricity Marketing Considering Environmental Evaluation	Masahiro Ozawa	Nagoya Institute of Technology, Japan
10:15	0113	Evolutionary Game Theoretic Analysis on Environmental Measures of Supply Chain Enterprises under Government Subsidy and Cap-and-Trade	Etsuko Kusukawa	Osaka Prefecture University, Japan

Monday, July 19, 2021

9:30 PM ~ 10:30 PM

Session **19103**

Chair: Gursel A. Suer

Supply Chain Management (SM)

9:30	0063	Addressing the Relation Between Transparency and Supply Chain Finance Schemes	Luca Mattia Gelsomino	Windesheim University of Applied Sciences, Netherlands
9:45	0070	Integrated Production Planning and Delivery Routing with Production-Based Customer Zoning and Manufacturing Synchronization	Gursel A. Suer	Ohio University, USA
10:00	0083	Multi-Objective Optimization Model for Coal Supply with Economic, Environmental, and Social Impact: Case Study in Coal-Fired Power Plants in Indonesia	Firly Rachmadiyah Baskoro	Hiroshima University, Japan
10:15	0132	Manufacturing Offshoring and Backshoring: A Contingency Perspective	Jan Olhager	Lund University, Sweden

Session **19104**

Chair: Agnieszka Stachowiak

Manufacturing: System & Automation (MS)

9:30	0223	Electrode Tab Deflection Detection for Pouch Lithium-Ion Battery Using Mask R-CNN	Yu-Min Chiang	National Quemoy University, Taiwan
9:45	0126	Description of A Proposed State-of-the-Art Automated Reconfigurable Robotic Airplane Fuselage Panel Final Assembly System	Yusuf Tansel Ic	Baskent University, Etimesgut, Turkey
10:00	0107	Comparison of Process Chains of Additive and Conventional Manufacturing	Nikolas Zimmermann	Fraunhofer Institute for Industrial Engineering IAO, Germany
10:15	0059	To Detect Defects Which are Three-Dimensional Changes by Using Their Bird's Eye View Images and Convolutional Neural Networks	Suzuki Ryuki	Ibaraki University, Japan

Monday, July 19, 2021

9:30 PM ~ 10:30 PM

Session **19105**

Chair: Kuo-Ping Lin

Internet of Things, Data Analytics and Smart Manufacturing (IT)

9:30	0016	Method for the Development of Software-Defined Manufacturing Equipment	Adrian Barwasser	University of Stuttgart IAT, Germany
9:45	0036	Assessing AI-Readiness in Production – A Conceptual Approach	Heidi Heimberger	Fraunhofer Institute for Systems and Innovation Research ISI, Germany
10:00	0037	Architecture for Predictive Maintenance Based on Integrated Models, Methods and Technologies	Andreas Werner	University of Stuttgart IAT, Germany
10:15	0043	Wind Power Forecasting Using Long Short Term Memory Network with Decomposition Method	Kuo-Ping Lin	Tunghai University, Taiwan

Session **19106**

Chair: Byung-In Kim

Industrial Engineering and Operations Research (IE)

9:30	0012	A Quantifying Method of the News Impact on the Stock Price	Pedro Palominos	University of Santiago of Chile, Chile
9:45	0019	Proposal of a Firefly Algorithm with Three Types of Functionally Differentiated Fireflies	Masaki Nagai	Okayama University, Japan
10:00	0022	The Value of Product Tracking Information: An Analytical Approach to Using the Newsvendor Model	Hisashi Kurata	Yokohama National University, Japan
10:15	0026	Applying Overall Equipment Effectiveness to Pipe Jacking Tunneling in Construction Industry	Horng-Chyi Horng	Chaoyang University of Technology, Taiwan

Monday, July 19, 2021

9:30 PM ~ 10:30 PM

Session **19107**

Chair: Hing Kai Chan

Sustainable Production (SP)

9:30	0058	Smart Eco-Factory – Aspects for Next Generation Facilities Supporting Sustainable and High-Tech Production	Michael Hertwig	Fraunhofer Institute for Industrial Engineering IAO, Germany
9:45	0088	The Third-Party Logistics Owned Integrated Reusable Transport Item Logistics System: Focusing on the Shared Transportation Strategy	Hing Kai Chan	University of Nottingham Ningbo China, China
10:00	0114	Systematic Literature Review Using the Proknow-C Methodology on the Use of Audits to Implement Energy Management	Everton Luiz Vieira	Pontifical Catholic University of Paraná, Brazil
10:15	0131	A Green Approach on Multiple Allocation Hub Covering Flow Problem	Nazmi Sener	Independent Scholar, Turkey

Session **19109**

Chair: Sang Won Yoon
Chin-Yin Huang

PRISM30 (PR)

9:30	0235	Product and Corporate Culture Diffusion via Twitter Analytics: A Case of Japanese Automobile Manufactures	Shogo Matsuno	Gunma University, Japan
9:45	0236	An Adaptive Method for the Components' Post-Reflow Misalignment Prediction in A Dynamic Surface Mount Assembly Line	Daehan Won	The State University of New York at Binghamton, USA
10:00	0237	Discovering Defective Products Based on Multivariate Sensors Data Using Local Recurrence Rate and Robust K-Means Clustering	Chao-Lung Yang	National Taiwan University of Science and Technology, Taiwan
10:15	0239	Reflow Oven Recipe Optimization Based on Simulation	Sang Won Yoon	The State University of New York at Binghamton, USA

Session **19110**

Chair: Kim Hua Tan

New Product Development and Innovation Management (NP)

9:30	0033	Developing High-Variant Products and Production Systems in Line with Value Stream Requirements through Simulation	Oliver Scholtz	Fraunhofer Institute for Industrial Engineering, Germany
9:45	0035	A Study of Perceived Level of Difficulty for the Execution of the New Product Development Process	Lucas, Kwai Hong Lui	The Hong Kong Polytechnic University, Hong Kong
10:00	0047	Hybrid Agile Methodology for the Design and Manufacture of Products Considering Different Stakeholders	Pedro Palominos	University of Santiago of Chile, Chile
10:15	0056	Is That Innovation? Unlocking Vietnamese MedTech SMEs Innovation Pathways	Kim Hua Tan	Nottingham University Business School, England

Monday, July 19, 2021

10:40 PM ~ 11:40 PM

Session **19201**

Chair: Keisuke Nagasawa, Tetsuo Yamada, Masayuki Matsui

Impact of the Pandemic on Industry and Production (IP)

10:40	0168	Evaluation of Material-Based GHG Emissions Under COVID-19 Disruption on Redesigning Global Supply Chain Network Across TPP Countries	Tetsuo Yamada	The University of Electro-Communications, Japan
10:55	0170	Modeling Solar Energy Demand-to-Supply Management by On-Demand Cumulative-Control Method	Tetsuo Yamada	The University of Electro-Communications, Japan
11:10	0171	How to Measure Physical Stress for Dual-Income Couple Supporting Work-life Balance in Digital Edge?	Seiko Taki	Chiba Institute of Technology, Japan
11:25	0173	Modeling of Inventory Routing Problem with Intermediate Locations in Emergency Logistics Considering Uncertainty of Road Conditions	Aya Ishigaki	Tokyo University of Science, Japan

Session **19202**

Chair: Moshe Kaspi

Supply Chain Management (SM)

10:40	0064	Theory of Agency in Supply Chain Finance: Taking A Hermeneutic Approach	Luca Mattia Gelsomino	Windesheim University of Applied Sciences, Netherlands
10:55	0077	The Role of Machine Learning in Supply Chain Management	Thais Carreira Pfutzenreuter	Pontifical Catholic University of Parana, Brazil
11:10	0085	A Data-Driven Robust Decision Making for the Quick Response	Shunichi Ohmori	Waseda University, Japan
11:25	0099	Optimal Operation in A Green Closed-Loop Supply Chain under Government's Environmental Policies and Social Welfare	Etsuko Kusukawa	Osaka Prefecture University, Japan

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10:40 PM ~ 11:40 PM

Session **19204**

Chair: Yu-Ju Lin

Manufacturing: System & Automation (MS)

10:40	0042	Robotic Manipulation: An Industry-Implementation Oriented Categorization	Ran Shneor	Ben-Gurion University of the Negev, Israel
10:55	0040	A Multi-Objective Fitness Function for Sequencing Robotic Assembly Operations with Deformable Objects Using A Genetic Algorithm with Constraint Satisfaction	Shir Ben-David	Ben-Gurion University of the Negev, Israel
11:10	0020	A State Tracing Method for the System Data Obeying Poisson Distribution	Yuto Torisaka	Okayama University, Japan
11:25	0006	Applying Data Driven Approach to Cluster Components for Preventive Maintenance	Ming-Shien Cheng	Ming Chi University of Technology, Taiwan

Session **19205**

Chair: Chia-Yen Lee

Internet of Things, Data Analytics and Smart Manufacturing (IT)

10:40	0104	IoT Framework and Requirement for Intelligent Industrial Pyrolysis Process to Recycle CFRP Composite Wastes: Application Study	Mehar Ullah	Lappeenranta University of Technology, Finland
10:55	0106	Data Science and Support Vector Data Description for Quality Control in Machine Tool Implementation of Yolo-Family Algorithms in Classifying the Product Quality for the ABS Metallization	Chia-Yen Lee	National Taiwan University, Taiwan
11:10	0118	Approach of Automated ML Algorithm Selection for the Realization of Intelligent Production	Yuh Wen Chen	Da-Yeh University, Taiwan
11:25	0122		Johannes Wimmer	University of Stuttgart IAT, Germany

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10:40 PM ~ 11:40 PM

Session **19206**

Chair: Takashi Irohara

Industrial Engineering and Operations Research (IE)

10:40	0027	How Moderating Variables Affect Scheduling Objectives in Unpaced Mixed-Model Assembly Lines	Frederik Ostermeier	Technical University of Dortmund, Germany
10:55	0030	Proposal of the Algorithm for Solving the Component Assignment Problem in A Linear Consecutive System with Three Failure Modes	Taishin Nakamura	Tokai University, Japan
11:10	0044	Dynamic Fleet Routing, Scheduling, and Cargo Assignment for Container Shipping with Stochastic Demand in Maritime Logistics	Runqi Hong	Sophia University, Japan
11:25	0045	Metaheuristics Based Profit-Oriented Optimization Model for the Hazardous Waste Location Routing Problem	Amani Junaidi	Sophia University, Japan

Session **19207**

Chair: Ming-Lang Tseng

Sustainable Production (SP)

10:40	0115	Energy Management Practices in A Compact Supermarket in Brazil	Everton Luiz Vieira	Pontifical Catholic University of Paraná, Brazil
10:55	0141	Assessment of Digital Twin Features for Addressing Production Sustainability Challenges	Mihai Dragomir	Technical University of Cluj-Napoca, Romania
11:10	0146	Sustainable Purchase Intentions: Improving Recycled Packaging Eco-Labeling Certification Using A Cognitive Best-Worst Choice Experiment	Ming-Lang Tseng	Asia University, Taiwan
11:25	0147	Building a Hierarchical Sustainable Development Transition Model in Qualitative Information Approach: An Electricity Company in Indonesia	Ming Lang Tseng	Asia University, Taiwan

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10:40 PM ~ 11:40 PM

Session **19209**

Chair: Sang Won Yoon
Chin-Yin Huang

PRISM30 (PR)

10:40	0240	Non-Parametric Bayesian Estimation of Endpoint Configuration Densities	Sigal Berman	Ben-Gurion University of the Negev, Israel
10:55	0241	Study of Replenishment Process of Pharmacy Robotic Dispensing Systems Based on Modeling and Simulation Approach	Soongeol Kwon	The State University of New York at Binghamton, USA
11:10	0242	Demand and Capacity Sharing Protocol in Collaborative Fresh Produce Supply Networks	Francisco Munoz	Purdue University, USA
11:25	0248	Crop Plants Stress Monitoring with Bayesian Network Inference in Cyber-Physical System	Win P. V. Nguyen	Purdue University, USA

Session **19210**

Chair: Yasutaka Kainuma

New Product Development and Innovation Management (NP)

10:40	0057	Crowd Engineering Platform – Functions Supporting Co-Creation in Product Development	Michael Hertwig	Fraunhofer-Institute for Industrial Engineering, IAO, Germany
10:55	0060	Application Potentials of Model-Based Systems Engineering for the Development of Cognitive Digital Twins in Manufacturing Industry	Benjamin Schneider	Fraunhofer Institute for Industrial Engineering IAO, Germany
11:10	0062	An Investigative Study on the Compression Moulding Process to Manufacture Fibre-Reinforced Epoxy Composites Using Recycled Carbon and Glass Fibres	Sankar Karuppanan Gopalraj	Lappeenranta-Lahti University of Technology, Finland
11:25	0095	Integration of Life Cycle Assessment (LCA) for Environmental Sustainability Issues in A Variety of Onigiri (Rice Balls)	Thanyatorn Fongsatitkul	Tokyo Metropolitan University, Japan

Tuesday, July 20, 2021

9:30 PM ~ 10:30 PM

Session **20101**

Chair: Kazushi Okamoto, Tetsuo Yamada, Masayuki Matsui

Impact of the Pandemic on Industry and Production (IP)

9:30	0175	Problem of Modeling Global and Closed-Loop Supply Chain Network Design	Tetsuo Yamada	The University of Electro-Communications, Japan
9:45	0179	Vehicle Relocation Scheduling Considering Charging Time for One-way Electric Vehicle Car-Sharing Systems	Aya Ishiagki	Tokyo University of Science, Japan
10:00	0181	Effect of Online Project-based Learning on Human Resources Development using Lego Assembly	Aya Ishigaki	Tokyo University of Science, Japan
10:15	0198	Prediction of COVID-19 Hospital Beds by On-Demand Cumulative-Control Analysis	Tetsuo Yamada	The University of Electro-Communications, Japan

Session **20102**

Chair: W. B. Lee

Supply Chain Management (SM)

9:30	0183	Optimizing the Supply of Eucalyptus for Agroindustry: A Mathematical Programming Approach	Moises Knaut Tokarski	Federal University of Parana, Brazil
9:45	0069	Green Television Supply Chain Under Capital Constraint for Achieving Environmental Sustainability	Song-Man Wu	The Hong Kong Polytechnic University, Hong Kong
10:00	0052	An Optimum Switching Model of Production Systems Considering Efficiency, Delivery Time and Green Evaluation	Akihiro Yano	Nagoya Institute of Technology, Japan
10:15	0108	Impact of Consumer Free Riding Behavior on Optimal Operation in Green Closed-Loop Supply Chain with Dual Channel	Etsuko Kusukawa	Osaka Prefecture University, Japan

Session **20103**

Chair: Ching-Jung Ting

Logistics Engineering and Management (LE)

9:30	0003	Improvement of Area Priority Setting of Sequential Processing Storage Location Recommendation Technology Considering Stock Storage Period	Naoki Furuya	R&D Group, Hitachi Ltd., Japan
9:45	0050	Intra-Route Location Routing for the Pickup and Delivery Problem with Transfers Method for Determining Loading Positions of Delivered Parcels by Genetic Algorithm with Three- Dimensional Modified BL Method with Multidirectional Reference Points	Cansu Agrali	Purdue University, USA
10:00	0073	An Iterative Local Search for the Periodic Capacitated Arc Routing Problem	Eiji Harayama	Okayama University, Japan
10:15	0101		Ching-Jung Ting	Yuan Ze University, Taiwan

Session **20104**

Chair: Jaewoo Chung

Manufacturing: System & Automation (MS)

9:30	0005	Process Simulation of Compression Molding Process and Effect of Fiber Content on Recycled Polymer Natural Fiber Composites Using Moldflow Analysis	Vardaan Chauhan	Lappeenranta-Lahti University of Technology, Finland
9:45	0024	A Combined Scheduling and Simulation Method to Analyze the Performance of the Dual-Robot In- Line Stocker Multi-Stage Cellular Manufacturing System Design Under a Deterministic Environment	Jaewoo Chung	School of Business Administration, Kyungpook National University, Korea
10:00	0028	Analysis of Revised Worker Collaborative Models for Cellular Bucket Brigades with Discrete Work Stations	Gürsel A. Süer	Ohio University, USA
10:15	0041		Daisuke Hirotani	Prefectural University of Hiroshima, Japan

Session **20105**

Chair: Luis Quezada

Internet of Things, Data Analytics and Smart Manufacturing (IT)

9:30	0135	Balanced Scorecard Under the Industry 4.0 Approach: Conceptual Framework	Ilse Klapp	University of Santiago of Chile, Chile
9:45	0182	Machine Learning Applied to Predictive Maintenance: A Review	Renato Fernandes Grottoli	Federal University of Parana, Brazil
10:00	0231	Diopter Prediction for Soft Contact Lens Based on Support Vector Regression Model - Taking Polypropylene Molding as A Case Study on Big Data	Ching-Hsin, Wang	National Chin-Yi University of Technology, Taiwan
10:15	0068	Analytics based on Edge Computing for Smart Manufacturing System	Kwok Hung Sheron SIT	The Hong Kong Polytechnic University

Session **20106**

Chair: Boaz Golany

Industrial Engineering and Operations Research (IE)

9:30	0081	A Bi-Objective Integer Linear Optimization Model for Post-Departure Aircraft Rerouting Problem	Miriam F. Bongo	De La Salle University, Philippines
9:45	0097	Forecasting the Economic Number of Times Sheet Metal Subject to Corrosion Should be Painted Before Replacement	P. Carmona Marques	Lusófona University, Portugal
10:00	0098	Task Allocation Problem Between Human-Robot Collaboration Team	Ahmed Abide Tadesse	Bahir Dar University, Ethiopia
10:15	0100	An Exact Algorithm for the Monitoring Problem by Using Drones	Ilkyeong Moon	Seoul National University, Korea

Session **20107**

Chair: Edson Pinheiro de Lima

Sustainable Production (SP)

9:30	0187	Scheduling and Rescheduling in A Job-Shop-Type Remanufacturing System Restoring Customer-Owned Products	Katsumi Morikawa	Hiroshima University, Japan
9:45	0191	Sustainable Human Resource Simulation Considering Work Elements, Skills, Learning and Forgetting	Takayuki Kataoka	Kindai University, Japan
10:00	0214	A Linguistic MCDM Approach to Overcome Future Challenges of Vertical Farming	Gülçin Büyüközkan	Galatasaray University, Turkey
10:15	0221	Recyclable Recovery Unit: A Case Study. How Lean Can It Be?	David Iubel de Oliveira Pereira Grudzien	Pontifca Universidade Catolica do Paraná, Brazil

Session **20109**

Chair: Kuo-Ping Lin

Quality Engineering and Management (QE)

9:30	0018	Variable Sampling Plan Indexed by Taguchi's Quality Loss Under Emphasized Difference of Mean Proposal and Verification of	Shuto Tanabashi	Okayama University, Japan
9:45	0053	Quality Control Method by Adjusting Process Mean in Post-Process	Akimasa Otsuka	Sanyo-Onoda City University, Japan
10:00	0054	Production Log Data Analysis for Suspicious Machine Selection in A Serial-Parallel Multistage Manufacturing Process: A Literature Review	Kwang-Jae Kim	Pohang University of Science and Technology, Korea
10:15	0230	Process Analysis and Parameter Optimization Research on Deep-Hole Machining of the Key Spindle for Precision Machinery	Ching-Hsin Wang	National Chin-Yi University of Technology, Taiwan

Session **20110**

Chair: Kazuyoshi Ishii

New Product Development and Innovation Management (NP)

9:30	0128	Potential Contributions of Artificial Intelligence in Crowd Engineering	Frauke Schuseil	University of Stuttgart, Germany
9:45	0142	A Mindful Approach to Innovation as A Determinant of New Product Development Success: The Synthesis of Literature	Danijela Ciric	University of Novi Sad, Serbia
10:00	0148	Framework for the Identification of Fields of Innovation in the Product Environment Via Text Mining and Semantic Networks	Hendrik Lauf	RWTH Aachen University, Germany
10:15	0152	A Collaborative and Interactive Surface Concept for Early Stages of New Product Development – A Multi-Stage Expert Study	Verena Lisa Kaschub	University of Stuttgart, Germany

Session **20201**

Chair: Sergio Gouvea da Costa

Impact of the Pandemic on Industry and Production (IP)

10:40	0215	Robust and Sustainable Workforce Optimization in Closed-Loop Supply Chain Network Design	Keisuke Nagasawa	Hiroshima University, Japan
10:55	0196	Impact on Supply Chain Performance in the Automotive Sector in Times of Scarcity During A COVID-19 Pandemic	Alexandre Milkiewicz Sanches	Instituto Federal do Paraná, Brazil
11:10	0051	Enhancing Food Supply Chain Resilience by Adopting Blockchain Technology: A Systematic Literature Review	I-Hsuan Su	University of Nottingham, UK
11:25	0048	Manufacturing Systems for Operational Disruptions: A Literature Review	Alejandro Vital-Soto	Cape Breton University, Canada

Session **20202**

Chair: Wilfried Sihh

Supply Chain Management (SM)

10:40	0159	Optimal Operation and Social Welfare Evaluation in Closed-Loop Supply Chain Considering Subsidy, Tax and Warranty Period in Remanufacturing Activity	Kazuomi Uchida	Osaka Prefecture University, Japan
10:55	0162	Fuzzy Multi-Objective Mathematical Modelling for Distribution Planning	Gursel A. Suer	Ohio University, USA
11:10	0164	Business Analysis of Electronic Device Manufacturers on Business Continuity Plans under Uncertain Supply Chain Disruption Risks	Kotomichi Matsuno	Waseda University, Japan
11:25	0117	Optimal Operation and Social Welfare Evaluation in A Dual-Channel Green Supply Chain with Customer Purchasing Preference and Warranty Period	Etsuko Kusukawa	Osaka Prefecture University, Japan

Session **20203**

Chair: Gonzalo Mejía

Logistics Engineering and Management (LE)

10:40	0151	A Study on the Design of A Zone-Picking System with Cooperation Area Set Up Between Neighboring Zones and Its Cooperation Methods	Ying-Chin Ho	National Central University, Taiwan
10:55	0192	Redesigning the Current Inventory Management Process For an SME	Cecilia Montt	Universidad de Santiago de Chile, Chile
11:10	0202	Using Condition-based Maintenance Strategy to Develop An Integrated Maintenance Management Information System	Hsin Rau	Chung Yuan Christian University, Taiwan
11:25	0218	Food Industry Packaging System Assessment Model	Astrid Maria Oddershede	University of Santiago of Chile, Chile

Session **20205**

Chair: Chin-Yin Huang

Digital and Cyber Manufacturing and Services (DC)

10:40	0004	A Study on Skill Transfer Using Augmented Reality	Koichi Akagi	Mitsubishi Power, Ltd, Japan
10:55	0013	Humanized Robot of New Method & Time System and Its Management: A Digital Transformation Case of Convenience Store Type	Masayuki Matsui	The University of Electro-Communications, Japan
11:10	0025	Profiles and Testing in OPC UA – Current State and Future Potentials in Industry 4.0	Tonja Heinemann	Universität Stuttgart, Germany
11:25	0066	Manufacturing Workflows in Microservice Architectures Supporting Digital Transactions for Business Process Automation	Jaime Garcia Represa	Luleå University of Technology, Sweden
11:40	0199	Multimodal Assembly Instruction and Feedback System based on Augmented Reality and Artificial Intelligence in Cyber manufacturing	Md. Al-Amin	Missouri University of Science and Technology,

Session **20206**

Chair: Katsuhiko Takahashi

Industrial Engineering and Operations Research (IE)

10:40	0105	A Two-Level Induced OWA Procedure for Ranking DMUs under A DEA Cross-Efficiency Framework	Amar Oukil	Sultan Qaboos University, Oman
10:55	0109	Crop Plants Stress Monitoring with Bayesian Network Inference in Cyber-Physical System	Win P. V. Nguyen	Purdue University, USA
11:10	0112	Cyber Collaborative Warehouse for Work-of-the-Future	Puwadol Oak Dusadeerungsikul	Purdue University, USA
11:25	0116	Switching Decision in Hybrid MTS/MTO Production System of Multiple Machines with Setup	Katsuhiko Takahashi	Hiroshima University, Japan

Session **20207**

Chair: Athakorn Kengpol

Healthcare Management (HM)

10:40	0038	A Study of Disease Words Classification in Health Care for Potential Anxiety Factors Extraction	Hiroki Kozu	Nippon Institute of Technology, Japan
10:55	0071	An Optimization Model on Patient Appointment Scheduling of MRI Diagnostic Examination with Prioritization	Charlle Sy	De La Salle University, Philippines
11:10	0078	Deep Learning Food Assessment for the Elderly with Chronic Diseases During the COVID-19 Pandemic	Athakorn Kengpol	King Mongkut's University of Technology North Bangkok, Thailand
11:25	0129	Discrete Event Simulation for Pharmaceutical Supply Chain Analysis in India	Venkataramanaiah Saddikutla	Indian Institute of Management Lucknow, India

Session

20208

Production Tutorial

Production Tutorial: Web based Production Simulation with GD.findi

Presenter: Dr. Chawalit Jeenanunta,

Throughout this 1-hour hand-on tutorial, you will learn new production simulation software on cloud to easily create the simulation model of the factory. You will learn to construct simple production simulation models and move through advanced models which could represent the actual production plant. We will show you the features include the tool change over between different products, machine set up, and the work-in-process or buffer. Moreover, you could see how to use this simulation software to test various the production scheduling setting which is one of the critical issues in many factories. In addition, you will learn output visualization and data analysis tools such as material flow to track the flow of the parts through each machine. You will be introduced to different plant KPIs such as Overall Equipment Efficiency (OEE).

Dr. Chawalit Jeenanunta is a head of Center of Excellence in Logistics and Supply Chain Systems Engineering (LogEn) and the head of the Center for Technology Transfer of Industry 4.0, SIIT, Thammasat University, Thailand.

Session

20209

Chair: Kwang-Jae Kim

Quality Engineering and Management (QE)

10:40	0157	Fuzzy Testing of Ratio Operating Performance Index	Chun-Min Yu	National Chin-Yi University of Technology, Taiwan
10:55	0158	Six Sigma Process Yield Index	Kuo-Ping Lin	Tunghai University, Taiwan
11:10	0186	Assessment of Brazilian Universities' Internationalization Indicators Based on Multiple Criteria Decision Making	Marcia Cristina Alves dos Anjos Almeida	Pontífca Universidade Católica do Paraná, Brazil
11:25	0197	Maintenance Performance Management in Road Passenger Transport Companies	Alexandre Milkiewicz Sanches	Instituto Federal do Paraná, Palmas/PR, Brazil

Wednesday, July 21, 2021

10:00 PM ~ 11:30 PM

Session **21101**

Chair: Chawalit Jeenanunta

Industrial Engineering and Operations Research (IE)

10:00	0180	Simulation Optimization for Multi Product (s, S) Inventory Policy with Stochastic Demand	Ilkay Saracoglu	Istanbul Atlas University, Turkey
10:15	0185	Multi-Manned Assembly Line Balancing Problem in A Diesel Engine Manufacturing Company: A Real-World Case Study	Leandro Magatão	Federal University of Technology - Parana, Brazil
10:30	0203	Production Planning and Scheduling for Safety Shoes Manufacturing	Chawalit Jeenanunta	Thammasat University, Thailand
10:45	0209	Application of Agile Project Management Approaches in the Automotive Industry	Nathalia Juca Monteiro	Pontífica Universidade Católica do Paraná, Brazil
11:00	0228	Combinatorial Design of Reconfigurable Machining Systems	Alexandre Dolgui	IMT Atlantique, France
11:15	0009	An Operational Form of Bundling	Wee Meng Yeo	University of Glasgow, United Kingdom

Session **21102**

Chair: Veli Matti Virolainen

Supply Chain Management (SM)

10:00	0205	Government-Enterprise Coordination Mechanisms in the Presence of Social Sustainability and Infection Probability in Disaster Debris Supply Chains Management	Fanshun Zhang	School of Management, Jinan University, PR China
10:15	0208	A Vision for a Highly Automated Digital Urban Manufacturing Network - Solutions and Challenges	Veli Matti Virolainen	Lappeenranta-Lahti University of Technology, Finland
10:30	0065	Digital Supply Chain and Blockchain: A Living Lab Perspective	Luca Mattia Gelsomino	Windesheim University of Applied Sciences, Netherlands
10:45	0213	An Integrated Linguistic-Based MCDM Approach to Assess Supply Chain Resilience	Gülçin Büyüközkan	Galatasaray University, Turkey

Session **21103**

Chair: Ilkyeong Moon

Smart City (SC)

10:00	0055	An Effective Approach for the Emerging Challenges of Smart Cities: A Case Study on the Smart City of Tehran	Hasan Hüseyin Turan	University of New South Wales, Australia
10:15	0103	Investigation of Transport Logistics Disruptions From Urban Floods: A Case Study of the Chinese Coastal Megacity - Guangzhou, China	Hing Kai Chan	University of Nottingham Ningbo China, China
10:30	0127	Development of A Drone Transport Concept in Cooperation with A Crowd Sourcing Delivery Model for An Efficient Material Transport	Patrick Taschner	The Vienna University of Technology, Austria
10:45	0137	The Smart Bucket: An IoT Cloud-Based Optimization Technique for Smart Waste Management	Ilkyeong Moon	Seoul National University, Korea
11:00	0195	Locating Street Markets in Smart Cities: A View from Mathematical Modeling and Urban Planning Perspectives	Gonzalo Mejía	University of La Sabana, Colombia

Session **21104**

Chair: Kenichi Nakashima

Manufacturing: System & Automation (MS)

10:00	0075	A Study on the Optimal Assignment Rule in Parallel Production Systems with Two Special Workers	Xiaowen Zhao	Tokyo Metropolitan University, Japan
10:15	0121	A New Measure for Considering Both Inventory Level and Waiting Orders in MTS/MTO Hybrid Production Systems	Daisuke Hirotsu	Prefectural University of Hiroshima, Japan
10:30	0201	Considering A Deteriorating EOQ Model under Stochastic Demand and Shortage Allowed	Chiang-Sheng Lee	National Taiwan University of Science and Technology, Taiwan
10:45	0096	Seru Manufacturing-A Bibliometric Analysis	P. Carmona Marques	Lusófona University, Portugal

Session **21105**

Chair: Dušan Šormaz

Digital and Cyber Manufacturing and Services (DC)

10:00	0120	Augmented and Virtual Reality Support in Lean Teaching: A Systematic Literature Review	Tyas Yuli Rosiani	National Formosa University, Taiwan
10:15	0163	Scheduling 3D Printing Machines to Minimize Makespan Literature Review	Gursel A. Suer	Ohio University, USA
10:30	0184	Digital Transformation to Empower the Resource Allocation and Investment Decision in Semiconductor Testing Industry and An Empirical Study	Pei-Min Huang	National Tsing Hua University, Taiwan
10:45	0204	Digital Twin-Assisted Capacity Assessment for Flexible Manufacturing Systems	Anis Assad Neto	Pontifical Catholic University of Paraná, Brazil
11:00	0220	Interoperability between PLM, ERP, and MES Systems Using Formal Ontologies	Dušan Šormaz	Ohio University, USA

Session **21106**

Chair: Ying-Chin Ho

Industrial Engineering and Operations Research (IE)

10:00	0119	Multi-Objective Simulation Optimization Using Data Envelopment Analysis for Personnel Planning	Fatemeh Jalalvand	UNSW Canberra, Australia
10:15	0130	One-of-A-Kind Productions in Industry 4.0 Environments	Daniel Alejandro Rossit	Universidad Nacional del Sur, Argentina
10:30	0134	A Novel Graph-Theoretical Approach of Selecting Representative Pareto Optimal Solutions for Multi-Objective Optimization Problems	Sanath Kahagalage	University of New South Wales, Australia
10:45	0172	Graph Model Based Bill of Material Structure for Coupling Product Development and Production Planning	Xiaodu Hu	University of Stuttgart, Germany
11:00	0177	Mathematical Arguments in MedTech Offshoring from A Theoretical Evolutionary Perspective	Hannelore Ilesan	Technical University of Cluj-Napoca, Romania
11:15	0229	A Multi-Period Bioenergy Production Planning Model	Alexandre Dolgui	IMT Atlantique, France

Session **21107**

Chair: Shao Jen Weng

Healthcare Management (HM)

10:00	0089	Strategies and Challenges of Sustaining Improvements of Surgical Site Infections	Jau-Shin Hon	Tunghai University, Taiwan
10:15	0139	Dual Resource Scheduling in Trauma Care Centre with Time Varying Patient Demand	Venkataramanaiah Saddikutla	Indian Institute of Management Lucknow, India
10:30	0167	Evaluating the Efficacy of Traditional Embolization and Microsphere Embolization for Liver Cancer Through the Use of Data Mining	Jau-Shin Hon	Tunghai University, Taiwan
10:45	0200	Real-Time Scheduling of Bed Resource Allocation to Improve Emergency Overcrowding	Chih-Hao Chen	Tunghai University, Taiwan
11:00	0233	A New Approach to Reducing the Lead Time in Manufacturing Operations	Masamitsu Kiuchi	Tamagawa University, Japan
11:15	0234	Establishing A Procurement Model in Philippine Barangay Health Centers Using An Integer Linear Programming Model	Gabriel C. Bucu	University of Santo Tomas, Philippines

Session **21109**

Chair: Daniela Popescu

Human Factors Engineering (HF)

10:00	0011	An Emergency Preparedness and Evacuation Plan for PWD Village: A Human Factors Engineering Approach in Evacuation Research	Hazel A. Caparas	Bulacan State University, Philippines
10:15	0049	Examining the Correspondence of Cognitive Costs and the Mutual Information Criterion in Rational Inattention Models	Wu Qi	Tokyo University of Science, Japan
10:30	0094	A Worker Assignment and Assembly Line Balancing Model Considering Workforce Ageing	Busra Nur Yetkin	Eskisehir Osmangazi University, Turkey
10:45	0150	The Concept of Gamification in Manufacturing Research: Science Mapping Approach Using Bibliometrix R-Tool	Danijela Ciric	University of Novi Sad, Serbia
11:00	0244	A Proposed Model for 3D Printing Education in the University	Anca Draghici	Politehnica University of Timisoara, Romania
11:15	0245	Multimedia Skills Development to Support Engineering Studies	Anca Draghici	Politehnica University of Timisoara, Romania

Session **21110**

Chair: Rob Dekkers

New Product Development and Innovation Management (NP)

10:00	0153	Interorganizational New Product Development: A Future Vision of Project Team Support on An Organizational, Relational, and Content-Related Collaboration Level	Katharina Dieterich	University of Stuttgart, Germany
10:15	0156	Using An Actual Design Method for the Design of Research Methodologies: Case of the Dichotomy Exploration and Exploitation in Context of Innovation Management	Rob Dekkers	University of Glasgow, Scotland
10:30	0178	Reconstructing March's Exploration and Exploitation Using A Focus Group: Potential Dilemma between Theory and Practice in Innovation Management?	Qijun Zhou	University of Greenwich, UK
10:45	0194	Sustainability in Product Development: A Focus Group into Sectoral and Firm Challenges in Scottish Aerospace Industry	João Paulo Estevam de Souza	University of Glasgow, UK
11:00	0206	Analysis of Use Cases for Artificial Intelligence in the Field of Engineering	Benjamin Schneider	Fraunhofer Institute for Industrial Engineering IAO, Germany
