Conference Overview

from	to	Sunday	Monday	Tuesday	Wednesday	Thursday
8:30	8:45	DW Intro			Parallel Sessions #7	**Industry Tours** Amazon Fulfillment Center (8:30-12:30) EOS Additive Manufacturing (8:30-12:30)
8:45	9:00	Doctoral Workshop (Session 1&2)	Opening Ceremony Keynote Address 1 Paper 138	Parallel Sessions #4		
9:00	9:15					
9:15	9:30					
9:30	9:45					
9:45	10:00				Coffee Break	
10:00	10:15	Break (15 min)		Coffee Break		
10:15	10:30		Coffee Break			
10:30	10:45	Doctoral Workshop (Session 3&4)		Keynote Address 2 Keynote Address 3	Plenary Session 2	
10:45	11:00		Parallel Sessions #1			
11:00	11:15					
11:15	11:30					
11:30	11:45					
11:45	12:00					
12:00	12:15	Lunch (60 min)		Lunch (75 min)	Lunch (75 min)	
12:15	12:30					
12:30	12:45		Lunch (75 min)			Amazon Fulfillment Center (12:30-3:15)
12:45	13:00					
13:00	13:15	Doctoral Workshop (Session 5)				
13:15	13:30			Parallel Sessions #5	Parallel Sessions #8	
13:30	13:45					
13:45	14:00	DW Closing				
14:00	14:15			Coffee Break		
14:15	14:30		Parallel Sessions #2	Parallel Sessions #6		
14:30	14:45					
14:45	15:00					
15:00	15:15				Coffee Break	
15:15	15:30		Coffee Break			
15:30	15:45	WG 5.7 Meeting		Coffee Break		
15:45	16:00		Parallel Sessions #3	Plenary Session 1	Closing Ceremony	
16:00	16:15					
16:15	16:30					
16:30	16:45					
16:45	17:00					
17:00	17:15					
17:15	17:30			*Tuesday sessions are 75 minutes*		
17:30	17:45					
17:45	18:00					
18:00	18:15					
18:15	18:30					
18:30	18:45	Welcome Reception (18:30-20:00)		Gala Dinner (18:30-20:30)		
18:45	19:00					
19:00	19:15					
19:15	19:30					
19:30	19:45					
19:45	20:00					

ifip Working Group 5.7 Advances in Production Management Systems

Sessions Overview

Keynotes & Opening/Closing sessions	Regular Sessions	Plenary Sessions	Special Sessions	Special Interest Group Sessions

Date: Monday, 02/Sep/2019

Time / Room	Session
9:00am - 10:30am Salon J	**Opening Ceremony**
11:00am - 12:30pm 615A	**Blockchain in Supply Chain Management**
11:00am - 12:30pm 602	**Production Management in Food Supply Chains (1)**
11:00am - 12:30pm 616B	**The Operator 4.0 and the Internet of Things, Services and People (1) An SM & CPPS SIG Workshop Session**
11:00am - 12:30pm 615B	**Production Planning and Control (2)**
11:00am - 12:30pm 616A	**Research Workshop**
1:45pm - 3:15pm 616A	**Operations Management in Engineer-to-Order Manufacturing (1)**
1:45pm - 3:15pm 602	**Production Management in Food Supply Chains (2)**
1:45pm - 3:15pm 616B	**The Operator 4.0 and the Internet of Things, Services and People (2) An SM & CPPS SIG Workshop Session**
1:45pm - 3:15pm 615B	**Sustainability and Production Management**
1:45pm - 3:15pm 615A	**Variety and Complexity Management in the Era of Industry 4.0 (1)**
3:45pm - 5:15pm 616A	**Operations Management in Engineer-to-Order Manufacturing (2)**
3:45pm - 5:15pm 602	**Production Management in Food Supply Chains (3)**
3:45pm - 5:15pm 615B	**Participatory Methods for Supporting Career choices in Industrial Engineering and Management and Education**
3:45pm - 5:15pm 616B	**The New Frontiers of Service Engineering: Designing and Delivering Smart Services in The Digital Age**
3:45pm - 5:15pm 615A	**Variety and Complexity Management in the Era of Industry 4.0 (2)**

Date: Tuesday, 03/Sep/2019

Time / Room	Session
8:30am - 9:45am 615B	Intelligent Diagnostics and Maintenance Solutions for Smart Manufacturing, an SM & CPPS SIG workshop session
8:30am - 9:45am 616B	Smart Factory and IOT
8:30am - 9:45am 602	Product and Asset Life Cycle Management in Smart Factories of Industry 4.0 (1)
8:30am - 9:45am 616A	Production Planning and Control (1)
8:30am - 9:45am 615A	Variety and Complexity Management in the Era of Industry 4.0 (3)
10:15am - 11:45am Salon J	Keynote Address 2&3
1:00pm - 2:15pm 616B	Cyber Physical Systems
1:00pm - 2:15pm 616A	Lean Production (1)
1:00pm - 2:15pm 602	Product and Asset Life Cycle Management in Smart Factories of Industry 4.0 (2)
1:00pm - 2:15pm 615A	Sustainability and Reconfigurability of Manufacturing Systems (1)
1:00pm - 2:15pm 615B	Supply Chain Planning and Optimization (1)
2:30pm - 3:45pm 616B	Collaborative Technology (2)
2:30pm - 3:45pm 602	Data-driven Production Management
2:30pm - 3:45pm 616A	Lean Production (2)
2:30pm - 3:45pm 615A	Sustainability and Reconfigurability of Manufacturing Systems (2)
2:30pm - 3:45pm 615B	Supply Chain Planning and Optimization (2)
4:00pm - 5:15pm Salon J	Plenary Session 1: Emerging Challenges and Research Opportunities in Smart Services

Date: Wednesday, 04/Sep/2019

Time / Room	Session
8:30am - 10:00am 616B	**Knowledge Management in Design and Manufacturing**
8:30am - 10:00am 615B	**Collaborative Technology (1)**
8:30am - 10:00am 616A	**Industry 4.0 Implementations**
8:30am - 10:00am 615A	**Supply Chain Planning and Optimization (3)**
10:30am - 12:00pm Salon J	**Plenary Session 1: Towards Smart Production Management Systems: Things, Services and People**
1:15pm - 2:45pm 616B	**Collaborative Product Development**
1:15pm - 2:45pm 616A	**ICT for Collaborative Manufacturing**
1:15pm - 2:45pm 615A	**Machine Learning in Production Management**
1:15pm - 2:45pm 615B	**Workflow and Inventory Planning**
3:30pm - 5:00pm Salon J	**Closing Ceremony**

Detailed Agenda

9:00am - 10:30am

Opening Ceremony
Location: **Salon J**

Keynote 1: Managing Risk and Opportunities in Complex Projects
Asbjørn Rolstadås

Norwegian University of Science and Technology

The APMS Conference & IFIP WG5.7 in the 21st Century - A Bibliometric Study
Makenzie Keepers[1], David Romero[2], Thorsten Wuest[1]
1: West Virginia University, United States of America; 2: Tecnológico de Monterrey, México

11:00am - 12:30pm

Blockchain in Supply Chain Management	Production Management in Food Supply Chains (1)
Location: **615A**	Location: **602**
Chair: **Volker Stich**	Chair: **Irenilza de Alencar Nääs**

Towards a Blockchain Based Traceability Process: A Case Study from Pharma Industry
Ferdinando Chiacchio[1], Diego D'Urso[1], Lucio Compagno[1], Marcello Chiarenza[2], Luca Velardita[2]
1: Università degli Studi di Catania, Italy; 2: SIFI SPA, Information and Communication Technology

Neuro-fuzzy System for the Evaluation of Soya Production and Demand in Brazilian Ports.
Emerson Rodolfo Abraham[1], João Gilberto Mendes dos Reis[1], Aguinaldo Eduardo de Souza[1], Adriane Paulieli Colossetti[2]
1: Universidade Paulista UNIP, Brazil; 2: Sunsetti Treinamentos e Serviços

An Architecture of IoT-based Product Tracking with Blockchain in Multi-Sided B2B Platform
Shantanoo Desai[1,2], Quan Deng[1], Stefan Wellsandt[1,2], Klaus-Dieter Thoben[1,2]
1: BIBA - Bremer Institut für Produktion und Logistik GmbH, Hocschulring 20, 28359 Bremen, Germany; 2: Faculty of Production Engineering, University of Bremen, Badgasteiner Straße 1, 28359 Bremen, Germany

Port Logistic Support Areas (PLSA) for Exporting Grains: A Case-study in the Largest Port in Latin America
Clayton Gerber Mangini[1,2], Irenilza de Alencar Nääs[1], Antônio Carlos Estender[1,3], Meykson Rodrigues Alves Cordeiro[1], Agnaldo Vieira Silva[1]
1: Paulista University-Graduate Program in Production Engineering, Brazil; 2: FATEC Baixada Santista – Rubens Lara. 11045-908, SP, Brazil; 3: FATEC Franco da Rocha – São Paulo. 04026-002, SP, Brazil

Blockchain as Middleware+
David Holtkemper[1], Günther Schuh[2]
1: Institute for Industrial Management, Germany; 2: WZL at RWTH Aachen Universit, Germany

Port Terminals Assesment: An Empirical Analysis of Requirements of Brazilian National Plan of Port Logistics
AGUINALDO EDUARDO DE SOUZA[1], João Gilberto Mendes dos Reis[2], Ataide Pereira Cardoso Junior[3], Emerson Rodolfo Abraham[4], Oduvaldo Vendrametto[5], Renato Marcio dos Santos[6], Roberta Sobral Pinto[7]
1: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UNIBR, São Vicente, Brazil; 2: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UFGD, PPGA, Dourados, Brazil; 3: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 4: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 5: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 6:

A Blockchain Application Supporting the Manufacturing Value Chain
Bjorn Jager, Terje Bach, Simen Alexander Pedersen
Molde University College, Norway

Design of a Blockchain-driven System for Product Counterfeiting Restraint in the Supply Chain

Sotiris P. Gayialis, Evripidis Kechagias, Georgios A. Papadopoulos, Grigorios D. Konstantakopoulos

National Technical National Technical University of Athens, School of Mechanical Engineering, Iroon Polytechniou 9, 15780, Athens, Greece

Paulista University - UNIP, PPGEP, São Paulo, Brazil; 7: UNISA, Universidade Santo Amaro, S˜ao Paulo, Brazil

An Evaluation of Brazilian Ports for Corn Exportation Using Multicreteria Analisys

Aguinaldo Eduardo de Souza[1], João José Giardulli Junior[2], João Gilberto Mendes dos Reis[3], Ataide Pereira Cardoso Junior[4], Paula Ferreira da Cruz Correia[5], Ricardo Zandonadi Schimidt[6], José Benedito Sacomano[7], Márcia Terra da Silva[8]

1: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UNIBR, São Vicente, Brazil; 2: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 3: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UFGD, PPGA, Dourados, Brazil; 4: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 5: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 6: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 7: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 8: Paulista University - UNIP, PPGEP, São Paulo, Brazil

CNN-based Growth Prediction of Field Crops for Optimizing Food Supply Chain

Shunsuke Iitsuka[1], Nobutada Fujii[1], Daisuke Kokuryo[1], Toshiya Kaihara[1], Shinichi Nakano[2]

1: Kobe University, Japan; 2: Hyogo Prefectual Technology Center for Agriculture, Foresty and Fisheries, Japan

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The Operator 4.0 and the Internet of Things, Services and People (1) An SM & CPPS SIG Workshop Session

Location: **616B**
Chair: **David Romero**

Empowering and Engaging Solutions for Operator 4.0: Acceptance and Foreseen Impacts by Factory Workers

Eija Kaasinen, Susanna Aromaa, Päivi Heikkilä, Marja Liinasuo

VTT Technical Research Centre of Finland Ltd, Finland

Process Innovation in Learning Factories: Towards a Reference Model

Maria Stoettrup Schioenning Larsen, Astrid Heidemann Lassen, Kjeld Nielsen

Aalborg University, Denmark

Investments of the Automotive Sector and the Indus-try 4.0. Brazilian Case.

SERGIO MIELE RUGGERO, Nilza Aparecida dos Santos, José Benedito Sacomano, Marcia Terra da Silv

UNIVERSIDADE PAULISTA UNIP, Brazil

Smart Service Engineering: Promising Approaches for a Digitalized Economy

Production Planning and Control (2)

Location: **615B**
Chair: **Johan Oppen**

Postponement Revisited – A Typology for Displacement

Fredrik Tiedemann, Joakim Wikner

Jönköping University, School of Engineering, Sweden

Efficient Heuristic Solution Methodologies for Scheduling Batch Processor with Incompatible Job-Families, Non-Identical Job-Sized and Non-Identical Job-Dimensions

Muthu Mathirajan[1], M Ramasubramanian[2]

1: Indian Institute of Science, Bangalore, India; 2: Loyola Institute of Business Administration, Chennai, India

Increasing the Regulability of Production Planning and Control Systems

Günther Schuh, Philipp Wetzchewald

Institute for Industrial Management (FIR) at RWTH Aachen University, Germany

Optimizing Workflow in Cell-based Slaughtering and Cutting of Pigs

Johan Oppen

Møreforsking Molde, Norway

Jan Kuntz, Roman Senderek, Volker Stich, Jana Frank
FIR an der RWTH Aachen, Germany

Applicability of Agile Methods for Dynamic Requirements in Smart PSS Development

Stefan Alexander Wiesner[1], Jannicke Baalsrud Hauge[1,2], Paul Sonntag[3], Klaus-Dieter Thoben[1,3]
1: BIBA - Bremer Institut für Produktion und Logistik GmbH, Germany; 2: KTH – Royal Institute of Technology, Sweden; 3: University of Bremen, Germany

Research Workshop
Location: **616A**
Chair: **Martin Rudberg**
Chair: **Hans-Hermann Wiendahl**

1:45pm - 3:15pm

Operations Management in Engineer-to-Order Manufacturing (1)
Location: **616A**
Chair: **Erlend Alfnes**

Aspects for Better Understanding of Engineering Changes in Shipbuilding Projects: In-depth Case Study

Natalia Iakymenko, Marco Semini, Jan Ola Strandhagen
Norwegian University of Science and Technology, Norway

IPD Methodology in Shipbuilding

Hajnalka Vaagen, Lucky M. Masi
Norwegian University of Science and Technology, Department of Ocean Operations and Civil Engineering, Ålesund, Norway

Exploring Logistics Strategy in Construction

Martin Rudberg[1], Duncan Maxwell[2]
1: Linköping University, Sweden; 2: Monash University, Australia

Practical Guidelines for Production Planning and Control in HVLV production

Erik Gran[1], Erlend Alfnes[2]
1: SINTEF, Norway; 2: Norwegian university of science and technology

APS Feasibility in One-Of-a-Kind ERP Environments

Erlend Alfnes[1], Hans-Henrik Hvolby[1,2]
1: Norwegian University of Science and Technology, Trondheim; 2: Aalborg University, Denmark

Production Management in Food Supply Chains (2)
Location: **602**
Chair: **Irenilza de Alencar Nääs**

Horizontal Integration in Fresh Food Supply Chain

Flemming Max Møller Christensen[1], Soujanya Mantravadi[2], Iskra Dukovska-Popovska[1], Hans-Henrik Hvolby[1], Kenn Steger-Jensen[1], Charles Møller[2]
1: Centre for Logistics (CELOG), Materials & Production, Aalborg University, Denmark; 2: Centre for Industrial Production (CIP), Materials & Production, Aalborg University, Denmark

Reverse Logistics and Waste in the Textile and Clothing Production Chain in Brazil

Solimar Garcia[1], Irenilza de Alencar Nääs[2], Pedro Luiz de Oliveira Costa Neto[3], João Gilberto Mendes dos Reis[4]
1: Paulista University, Brazil; 2: Paulista University, Brazil; 3: Paulista University, Brazil; 4: Paulista University, Brazil

CO2 Gas Emissions of Soybean Production and Transportation in the Different Macro-regions of Mato Grosso State- Brazil

Marley Nunes Vituri Toloi[1,2], Rodrigo Carlo Toloi[1,2], Helton Raimundo Oliveira Silva[1], João Gilberto Mendes dos Reis[1], Silvia Helena Bonilla[1]
1: Paulista University, São Paulo, Brazil; 2: Federal Institute of Mato Grosso Campus Rondonópolis, Mato Grosso, Brazil

Asymmetrical Evaluation of Forecasting Models through Fresh Food Product Characteristics

Flemming Max Møller Christensen, Iskra Dukovska-Popovska, Casper Solheim Bojer, Kenn Steger-Jensen
Aalborg University, Denmark

Brazilian Coffee Export Network: An Analysis using SNA

Paula Ferreira da Cruz Correia[1], João Gilberto Mendes dos Reis[2], Aguinaldo Eduardo de Souza[3], Ataíde Pereira Cardoso Junior[4]

1: Paulista University - UNIP, PPGEP, São Paulo, Brazil; 2: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UFGD, PPGA, Dourados, Brazil; 3: Paulista University - UNIP, PPGEP, São Paulo, Brazil, UNIBR, Sao Vicente, Brazil; 4: Paulista University - UNIP, PPGEP, São Paulo, Brazil

The Operator 4.0 and the Internet of Things, Services and People (2) An SM & CPPS SIG Workshop Session
Location: **616B**
Chair: **David Romero**

Task-Technology Fit in Manufacturing: Examining Human-Machine Symbiosis through a Configurational Approach

Patrick Mikalef, Hans Torvatn, Emrah Arica
SINTEF, Norway

Augmented Reality for Humans-Robots Interaction in Dynamic Slotting "Chaotic Storage" Smart Warehouses

Peter Papcun[1], Jan Cabadaj[1], Erik Kajati[1], David Romero[2], Lenka Landryova[3], Jan Vascak[1], Iveta Zolotova[1]

1: Technical University of Kosice, Faculty of Electrical Engineering and Informatics, Slovak Republic; 2: Tecnológico de Monterrey, Mexico; 3: VSB – Technical University of Ostrava Ostrava, Czech Republic

Analyzing Human Robot Collaboration with the Help of 3D Cameras

Robert Gloeckner[1], Lars Fischer[2], Arne Dethlefs[2], Hermann Lödding[1]
1: Hamburg University of Technology, Germany; 2: Garz & Fricke GmbH

Strategies for Implementing Collaborative Robot Applications for the Operator 4.0

Åsa Fast-Berglund[1], David Romero[2]
1: Chalmers University of Technology, Sweden; 2: Tecnológico de Monterrey, Mexico

Situation Awareness for Effective Production Control

Andreas D. Landmark, Emrah Arica, Birgit Kløve, Pål Furu Kamsvåg, Eva Amdahl Seim, Manuel Oliveira
SINTEF, Norway

Variety and Complexity Management in the Era of Industry 4.0 (1)
Location: **615A**
Chair: **Khaled Medini**

Bringing Advanced Analytics to Manufacturing: A Systematic Mapping

Sustainability and Production Management
Location: **615B**
Chair: **Bjorn Jager**

Configuring the Future Norwegian Macroalgae Industry Using Life Cycle Analysis

Jon Halfdanarson[1], Matthias Koesling[2], Nina Pereira Kvadsheim[1], Jan Emblemsvåg[1], Celine Rebours[3]
1: Møreforsking Molde AS, Norway; 2: NIBIO; 3: Møreforsking Ålesund AS, Norway

Business model innovation for eco-efficiency: an empirical study

YAN LI[1], Steve Evans[2]
1: University of Greenwich, United Kingdom; 2: Univerisity of Cambridge, United Kindom

Atmospheric Water Generation (AWG): Performance Model and Economic Analysis

Faraz Moghimi[1], Hamed Ghoddusi[2], Bahram Asiabanpour[1], Mahdi Behroozikhah[3]
1: Texas State University; 2: Stevens Institute of Technology; 3: University of California, San Diego

Life Cycle Assessment for Ordinary and Frost-resistant Concrete

Ramin Sabbagh, Paria Esmatloo
The University of Texas at Austin, United States of America

Operationalizing Industry 4.0: Understanding Barriers of Industry 4.0 and Circular Economy

Lise Lillebrygfjeld Halse, Bjørn Jæger
Molde University College, Norway

Hergen Wolf[1,2], <u>Rafael Lorenz</u>[1], Mathias Kraus[1], Stefan Feuerriegel[1], Torbjörn H. Netland[1]
1: ETH Zurich, Switzerland; 2: TU Dresden, Germany

Impact of Modeling Production Knowledge for a Data Based Prediction of Transition Times

Günther Schuh, Jan-Philipp Prote, Philipp Hünnekes, <u>Frederick Sauermann</u>, Lukas Stratmann
Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Germany

5G-Ready in the Industrial IoT-Environment - Requirements and Needs for IoT Applications Fom an Industrial Perspective

<u>Kay Burow</u>[1], **Marco Franke**[1], **Klaus-Dieter Thoben**[2]
1: BIBA - Bremer Institut für Produktion und Logistik GmbH, Germany; 2: University of Bremen, Institute for Integrated Product Development, Germany

Computer-aided Selection of Participatory Design Methods

Michael Bojko, <u>Ralph Riedel</u>, Mandy Tawalbeh
Chemnitz University of Technology, Germany

Customization and Variants in Terms of Form, Place and Time

Joakim Wikner, <u>Fredrik Tiedemann</u>
Jönköping University, School of Engineering, Sweden

3:45pm - 5:15pm	**Operations Management in Engineer-to-Order Manufacturing (2)** Location: **616A** Chair: **Erlend Alfnes**	**Production Management in Food Supply Chains (3)** Location: **602** Chair: **JOAO GILBERTO MENDES DOS REIS**

Digitalized Manufacturing Logistics in Engineer-to-Order Operations

<u>Jo Wessel Strandhagen</u>, **Sven-Vegard Buer, Marco Semini, Erlend Alfnes**
Norwegian University of Science and Technology, Trondheim, Norway

Architecture for a Digital Spare-Parts Library: Effective Use of Additive Layer Manufacturing in Petroleum Industry

R.M. Chandima Ratnayake[1], **Arvind Keprate**[2], **Roman Wdowik**[3]
1: Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, N4036, Stavanger, Norway.; 2: DNVGL, Høvik, 1363, Norway.; 3: Rzeszów University of Technology, The Faculty of Mechanical Engineering and Aeronautics, 35-959 Rzeszów, Poland

Purchasing Strategies, Tactics, and Activities in Engineer-to-Order Manufacturing

Collaborative Production Chain: A Case-Study of Two Agri-Food Companies in Brazil

Yuri Claudio C. de Lima[1,2], **Silvia Piva R. de Morais**[2], **Luis A. Mendes de M. Araujo**[2], **Daiane da S. A. Castelo Branco**[2], <u>Irenilza de Alencar Nääs</u>[2]
1: FACID/WYDEN, Teresina, Piaui, Brazil; 2: Paulista University-Graduate Program in Production Engineering, Brazil

Broiler meat production in Piaui State: A case study

<u>Eldelita A. Franco</u>, **Lilane Brandão, José A. Luz, Kelly Gonçalves, Irenilza Nääs**
PAULISTA UNIVERSITY, Brazil

Global Warming Impact in a Food Distribution System: A Case-study in an Elementary School in Piaui

Mikhail Shlopak, Espen Rød, Gabriele Hofinger Jünge
Møreforsking Molde AS, Norway

Genyvana Criscya Garcia Carvalho, Ivonalda Brito de Almeida Morais, Manoel Eulálio Neto, Raimundo Nonato Moura Rodrigues, Francisco Canindé Dias Alves, Irenilza de Alencar Nääs, Oduvaldo Vendrametto
UNIP- Paulista University, Brazil

Examining Circular Economy Business Models for Engineer-To-Order Products

Nina Pereira Kvadsheim[1], Deodat Mwesiumo[1], Jan Emblemsvåg[2]
1: Møreforsking Molde AS, Norway; 2: Molde University College

Sustainability of Meat Chain: The Carbon Footprint of Brazilian Consumers

Raquel Silva[1], João Gilberto Reis[1], Thayla Curi[2], Nilsa Lima[3], Solimar Garcia[1], Irenilza Naas[1]
1: University Paulista, Brazil; 2: Anhanguera Educacional College, Brazil; 3: University of Campinas, Brazil

Changing Markets: Implications for the Planning Process in ETO Companies

Kristina Kjersem[1], Marte F. Giskeødegård[2]
1: Møreforsking Molde AS, Norway; 2: NTNU Ålesund

Scenarios for the Development and Use of Data Products within the Value Chain of the Industrial Food Production

Volker Stich[1], Lennard Holst[1], Philipp Jussen[1], Dennis Schiemann[2]
1: FIR an der RWTH Aachen, Germany; 2: Lindt & Sprüngli Germany GmbH

Participatory Methods for Supporting Career choices in Industrial Engineering and Management and Education
Location: **615B**
Chair: **Nick B. Szirbik**

The New Frontiers of Service Engineering: Designing and Delivering Smart Services in The Digital Age
Location: **616B**
Chair: **Paolo Gaiardelli**

The Teaching of Engineers Focused on Innovative Entrepreneurship

DANIELLE MIQUILIM, MARCIA TERRA DA SILVA
Universidade Paulista, Brazil

The Impact of Digital Technologies on Services Characteristics: Towards Digital Servitization

David Romero[1], Paolo Gaiardelli[2], Giuditta Pezzotta[2], Cavalieri Sergio[2]
1: Tecnológico de Monterrey; 2: University of Bergamo, Italy

Digital servitization: The Next "Big Thing" in Manufacturing Industries

Ugljesa Marjanovic, Slavko Rakic, Bojan Lalic
University of Novi Sad, Serbia

Organization of Sales for Smart Product Service Systems

Benedikt Moser, Achim Kampker, Philipp Jussen, Jana Frank
Institute for Industrial Management at RWTH Aachen University, Germany

Capability-based Implementation of Digital Service Innovation in SMEs

David Görzig[1,2], Susann Kärcher[2], Thomas Bauernhansl[1,2]
1: IFF University of Stuttgart, Germany; 2: Fraunhofer IPA

A Dual Perspective Workflow to Improve Data Collection for Maintenance Delivery: An Industrial Case Study

Roberto Sala, Fabiana Pirola, Emanuele Dovere, Sergio Cavalieri
University of Bergamo, Italy

Variety and Complexity Management in the Era of Industry 4.0 (2)
Location: **615A**
Chair: **Ann-Louise Andersen**

A Framework for Identification of Complexity Drivers in Manufacturing Companies

Rasmus Andersen, Thomas Ditlev Brunoe, Kjeld Nielsen
Aalborg University, Denmark

A DSM Clustering Method for Product and Service Modularization

Omar Ezzat[1], Khaled Medini[1], Maria Stoettrup Schioenning Larsen[2], Xavier Boucher[1], Thomas D Brunoe[2], Kjeld Nielsen[2], Xavier Delorme[1]
1: Mines Saint-Etienne, Univ Clermont Auvergne, CNRS, UMR 6158 LIMOS, Institut Henri Fayol, 42023 Saint- Etienne, France; 2: Department of Materials and Production, Aalborg University, Aalborg, Denmark

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Identification of Platform Candidates through Production System Classification Coding

Daniel G.H. Sorensen[1], Hoda A ElMaraghy[2], Thomas Ditlev Brunoe[1], Kjeld Nielsen[1]
1: Aalborg University, Denmark; 2: University of Windsor, Canada

8:30am - 9:45am

Intelligent Diagnostics and Maintenance Solutions for Smart Manufacturing, an SM & CPPS SIG workshop session
Location: **615B**
Chair: **Farhad Ameri**

A Thesaurus-guided Method for Smart Manufacturing Diagnostics

Farhad Ameri, Reid Yoder
Texas State University, United States of America

A Study on the Diagnostics Method for Plant Equipment Failure

Minyoung Seo[1], HongBae Jun[2]
1: Puzzle systems co., Data Business Unit, Korea, Republic of (South Korea); 2: Hongik University, Korea, Republic of (South Korea)

Modeling the Maintenance Time Considering the Experience of the Technicians

Hyunjong Shin, Kai-Wen Tien, Vittaldas Prabhu
The Pennsylvania State University, United States of America

Detailed Performance Diagnosis Based on Production Timestamps: A Case Study

Johannes Cornelis de Man, Felix Mannhardt
SINTEF Digital, Norway

Product and Asset Life Cycle Management in Smart Factories of Industry 4.0 (1)
Location: **602**
Chair: **Irene Roda**

Risk Sources Affecting the Asset Management Decision-making Process in Manufacturing: a Systematic Review of the Literature

Adalberto Polenghi, Irene Roda, Marco Macchi, Paolo Trucco
Politecnico di Milano, Italy

A Method for Converting Current Data to RDF in the Era of Industry 4.0

Marlene Hildebrand, Ioannis Tourkogiorgis, Foivos Psarommatis, Damiano Arena, Dimitris Kiritsis
École polytechnique fédérale de Lausanne, Switzerland

Ontology-based Resource Allocation for Internet of Things

Zeinab Nezami[1,2], Kamran Zamanifar[1], Damiano Arena[2], Dimitris Kirtisis[2]
1: University of Isfahan, Iran, Islamic Republic of; 2: École Politechnique Fédérale de Lausanne (EPFL), Switzerland

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Smart Factory and IOT
Location: **616B**
Chair: **Thorsten Wuest**

Virtualisation of Sea Trials for Smart Prototype Testing

Moritz von Stietencron[1], Shantanoo Desai[1,2], Klaus-Dieter Thoben[1,2]
1: BIBA - Bremer Institut für Produktion und Logistik GmbH at the University of Bremen, Hochschulring 20, 28359 Bremen, Germany; 2: University of Bremen, Faculty of Production Engineering, Badgasteiner Straße 1, 28359 Bremen, Germany

IoH Technologies into Indoor Manufacturing Sites

Takeshi Kurata[1], Takashi Maehata[1], Hidehiko Hashimoto[1], Naohiro Tada[1], Ryosuke Ichikari[2], Hideki Aso[3], Yoshinori Ito[3]
1: SEI, Japan; 2: AIST, Japan; 3: JPS, Japan

Study on 3D Visualization of the Production History and Simulation Results for an Automotive Parts Supplier

Hwang Dahye, Noh Sang Do
Sungkyunkwan University, Korea, Republic of (South Korea)

OPPORTUNITIES OF INDUSTRY 4.0 IN SMES: A SECTORIAL ANALYSIS

Javier Luco, Sara Mestre, Ludovic Henry, Simon Tamayo, Frédéric Fontane
Mines ParisTech, France

Production Planning and Control (1)
Location: **616A**
Chair: **Eiji Morinaga**

Simulation Based Optimization of Lot Sizes for Opposing Logistic Objectives

Janine Tatjana Maier, Thomas Voss, Jens Heger, Matthias Schmidt
Leuphana University Lueneburg, Germany

A Proposal of Order Planning Method with Consideration of Multiple Organizations in Manufacturing System

Ken Yamashita[1], Toshiya Kaihara[1], Nobutada Fujii[1], Daisuke Kokuryo[1], Toyohiro Umeda[2], Rihito Izutsu[2]
1: Kobe University, Japan; 2: Kobe Steel, Ltd., Japan

Decision-making Process for Buffer Dimensioning in Manufacturing

Lisa Hedvall, Joakim Wikner
School of Engineering, Jönköping University, Sweden

Semantic Model-driven PLM data interoperability: an application for Aircraft Ground Functional testing with Eco-design criteria

Damiano Arena[1], Manuel Oliva[2], Ignacio Eguia[3], Carmelo Del Valle[3], Dimitris Kiritsis[1]

1: École Politechnique Fédérale de Lausanne, Switzerland; 2: AIRBUS, Spain; 3: University of Seville, Spain

Variety and Complexity Management in the Era of Industry 4.0 (3)
Location: **615A**
Chair: **Stefan Alexander Wiesner**

Reconfigurable Manufacturing: A Classification of Elements enabling Convertibility and Scalability

Alessia Napoleone[1], Ann-Louise Andersen[2], Alessandro Pozzetti[1], Marco Macchi[1]

1: Department of Management, Economics and Industrial Engineering, Politecnico di Milano, Milano, Italy; 2: Department of Materials and Production, Aalborg University, Aalborg, Denmark

Complexity Management in Production Systems: Approach for supporting problem solving through holistic structural consideration

Samuel Horler, Ralph Riedel, Egon Müller
Chemnitz University of Technology, Germany

Reconfigurable Manufacturing: A Case-Study of Reconfigurability Potentials in the Manufacturing of Capital Goods

Bjørn Christensen[1], Ann-Louise Andersen[1], Khaled Medini[2], Thomas Ditlev Brunoe[1]

1: Aalborg University, Denmark; 2: Mines Saint-Etienne University, France

Reduction of Computational Load in Robust Facility Layout Planning Considering Temporal Production Efficiency

Eiji Morinaga[1], Komei Iwasaki[1,2], Hidefumi Wakamatsu[1], Eiji Arai[1]
1: Osaka University, Japan; 2: Currently, NEC Corporation, Japan

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10:15am - 11:45am

Keynote Address 2&3
Location: **Salon J**

Redesigning Manufacturing Machines, Design Tools, and Robotics for Smart Human Augmented Spatial Interfaces

Karthik Ramani
Purdue University

Digitalization & Cybersecurity for Trusted Next Generation Supply Chains

Chip White
Georgia Institute of Technology

1:00pm - 2:15pm

Cyber Physical Systems
Location: **616B**
Chair: **Duck Young Kim**

Blockchain as an Internet of Services Application for an Advanced Manufacturing Environment

Lean Production (1)
Location: **616A**
Chair: **Christoph Roser**

Lean Leadership in production ramp-up

Uwe Dombrowski, Jonas Wullbrandt

Benedito Cristiano Aparecido Petroni[1], Jacqueline Zonichenn dos Reis[1], Rodrigo Franco Gonçalves[1,2]

1: Paulista University, Brazil; 2: Politecnic School, University of Sao Paulo, Brazil

Development of a Modeling Architecture Incorporating the Industry 4.0 View for a Company in the Gas Sector

Nikolaos A. Panayiotou, **Konstantinos E. Stergiou, Vasileios P. Stavrou**

National Technical University of Athens, Greece

Process for Enhancing the Production System Robustness with Sensor Data : A Food Manufacturer Case Study

Sofie Bech, Thomas Ditlev Brunoe, Kjeld Nielsen

Aalborg University, Denmark

In-process Noise Detection Methods for Product Quality Monitoring: Sensor Technologies and Acoustic Signal Analytics

Woonsang Baek, Duck-Young Kim

UNIST, Korea, Republic of (South Korea)

Product and Asset Life Cycle Management in Smart Factories of Industry 4.0 (2)
Location: **602**
Chair: **Irene Roda**

Conceptual Framework for a Data Model to Support Asset Management Decision-making Process

Adalberto Polenghi, Irene Roda, Marco Macchi, Alessandro Pozzetti
Politecnico di Milano, Italy

Identification of the Inspection Specifications for Achieving Zero Defect Manufacturing

Foivos Psarommatis, Dimitris Kiritsis
École polytechnique fédérale de Lausanne, Switzerland

Technical University Braunschweig, Germany

Using Prescriptive Analytics to Support the Continuous Improvement Process

Günther Schuh[1], Jan-Philipp Prote[1], Thomas Busam[2], Rafael Lorenz[3], Torbjörn H. Netland[3]

1: Laboratory for Machine Tools and Production Engineering (WZL), RWTH Aachen University, 52074 Aachen, Germany; 2: Schuh & Co. GmbH, 52074 Aachen, Germany; 3: Department of Management, Technology, and Economics, ETH Zurich, 8092 Zurich, Switzerland

Total Quality Management and Quality Circles in the Digital Lean Manufacturing World

David Romero[1], Paolo Gaiardelli[2], Daryl Powell[3], Thorsten Wuest[4], Matthias Thürer[5]
1: Tecnológico de Monterrey, Mexico; 2: University of Bergamo, Italy; 3: Norwegian University of Science and Technology, Norway; 4: West Virginia University, USA; 5: Jinan University, China

No Lean Without Learning: Rethinking Lean Production as a Learning System

Daryl John Powell[1], Eivind Reke[2]
1: Norwegian University of Science and Technology, Norway; 2: Los Norge, Norway

The Effect of Team Size on the Performance of Continuous Improvement Teams: Is Seven Really the Magic Number?

Daryl John Powell[1], Rafael Lorenz[2]
1: Norwegian University of Science and Technology, Norway; 2: ETH Zurich, Switzerland

Sustainability and Reconfigurability of Manufacturing Systems (1)
Location: **615A**
Chair: **Xavier Boucher**

Towards Reconfigurable Digitalized and Servitized Manufacturing Systems: Conceptual Framework

Xavier Boucher[1], Audrey Cerqueus[1], Xavier Delorme[1], Clemens Gonnermann[2], Magdalena Paul[2], Gunther Reinhart[2], Julia Schulz[2], Fabian Sippl[2]
1: Mines Saint-Etienne, Université Clermont Auvergne, LIMOS; 2: Institute for Machine Tools and Industrial Management (iwb), Technical University of Munich

Decision Support System for Joint Product Design and Reconfiguration of Production Systems

Seyyed Ehsan HASHEMI PETROODI[1], Clemens Gonnermann[2], Magdalena Paul[2], Simon Thevenin[1], Alexandre Dolgui[1], Gunther Reinhar[2]
1: IMT-Atlantique, Nantes, France; 2: Technical University Munich, Germany

Total Cost Of Ownership Driven Methodology For Predictive Maintenance Implementation In Industrial Plants

Irene Roda[1], Simone Arena[2], Marco Macchi[1], Pier Francesco Orrù[2]

1: Politecnico di Milano, Italy; 2: University of Cagliari, Italy

Classification of Optical Technologies for the Mapping of Production Environments

Marius Greger[1], Daniel Palm[1], Louis Louw[2], Konrad von Leipzig[2]

1: Reutlingen University, Germany; 2: University of Stellenbosch, South Africa

Hybrid Approach Using Ontology-supported Case-based Reasoning and Machine Learning for Defect Rate Prediction

Bongjun Ji[1,2], Farhad Ameri[1], Junhyuk Choi[2], Hyunbo Cho[2]

1: Texas State University, United States of America; 2: Pohang University of Science and Technology, Republic of Korea

A Competence-Based Description of Employees in Reconfigurable Manufacturing Systems

Svenja Korder, Barbara Tropschuh, Gunther Reinhart

Technical University of Munich, Germany

Supply Chain Planning and Optimization (1)
Location: **615B**
Chair: **Jan Frick**

Price Decision Making in a Centralized/decentralized Solid Waste Disposal Supply Chain with One Contractor and Two Disposal Facilities

Iman Ghalehkhondabi, Reza Maihami

Our lady of the lake university, United States of America

Understanding the Impact of User Behaviours and Scheduling Parameters on the Effectiveness of a Terminal Appointment System Using Discrete Event Simulation

Mihai Neagoe[1], Hans-Henrik Hvolby[2,3], Mohammad Sadegh Taskhiri[1], Paul Turner[1]

1: ARC Centre for Forest Value, Discipline of ICT, College of Sciences and Engineering, University of Tasmania, Hobart, AustraliaUniversity of Tasmania, Australia; 2: Centre for Logistics, Department of Materials & Production, Aalborg University, Aalborg, Denmark; 3: Department of Mechanical and industrial Engineering, Norwegian University of Science and Technology, Trondheim, Norway

Full-Scale Discrete Event Simulation of an Automated Modular Conveyor System for Warehouse Logistics

Alireza Ashrafian[1], Ole-Gunnar Pettersen[1], Kristian N Kuntze[1], Jacob Franke[1], Erlend Alfnes[1], Knut F. Henriksen[2], Jakob Spone[3]

1: Norwegian University of Science and Technology, Norway; 2: Swisslog, Norway; 3: ASKO, Norway

Handling Uncertainties in Production Network Design

Günther Schuh, Jan-Philipp Prote, Andreas Gützlaff, Sebastian Henk

Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University

2:30pm - 3:45pm	**Collaborative Technology (2)** Location: **616B** Chair: **Marcia Terra da Silva**

Data-driven Production Management
Location: **602**
Chair: **Jonas Wullbrandt**

Managing Knowledge in Manufacturing Industry -University Innovation Projects

Irina-Emily Hansen[1], Ola Jon Mork[1], Torgeir Welo[2]
1: Department of Ocean Operations and Civil Engineering, Norwegian University of Science and Technology; 2: Department of Mechanical and Industrial Engineering, Norwegian University of Science and Technology

Technology Companies in Judicial Reorganization

Ricardo Zandonadi Schmidt, <u>Márcia Terra</u>
Paulista University, Brazil

Multiscale Modeling for Social Systems: Bridging Scales via Decision Making

Nursultan Nikhanbayev, Toshiya Kaihara, Fujii Nobutada, Daisuke Kokuryo
Kobe university, Japan

e-Health: A Framework Proposal for Interoperability and Health Data Sharing. A Brazilian Case.

Neusa Maria Andrade[1,2], Pedro Luiz de Oliveira Costa Neto[1], Jair Gustavo de Mello Torres[1], Irapuan Glória Júnior[1], Cláudio Guimarães Scheidt[1,2], Welleson Gazel[1,2]
1: UNIP, Brazil; 2: SPDM, Associação Paulista para o Desenvolvimento da Medicina

From a Theory of Production to Data-based Business Models

Günther Schuh[1], Malte Brettel[2], Jan-Philipp Prote[1], <u>Andreas Gützlaff</u>[1], Frederick Sauermann[1], Katharina Thomas[1], Mario Piel[2]
1: Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Germany; 2: Innovation and Entrepreneurship Group (WIN) – TIME Research Area, RWTH Aachen University, Germany

Real-time Data Sharing in Production Logistics: Exploring Use Cases by an Industrial Study

<u>Masoud Zafarzadeh</u>[1], Jannicke Baalsrud Hauge[1], Magnus Wiktorsson[1], Ida Hedman[2], Jasmin Bahtijarevic[2]
1: KTH Royal Institute of Technology, Sweden; 2: AstraZeneca, Sweden

Open Access Digital Tools' Application Potential in Technological Process Planning: SMMEs Perspective

Roman Wdowik[1], R.M. Chandima Ratnayake[2]
1: Rzeszów University of Technology; The Faculty of Mechanical Engineering and Aeronautics, 35-959 Rzeszów, Poland; 2: Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, Norway

Bidirectional Data Management Between Factory Planning and Production

Uwe Dombrowski, Jonas Wullbrandt, Alexander Karl
Technische Universität Braunschweig, Germany

Lean Production (2)
Location: **616A**
Chair: **Christoph Roser**

Sustainability and Reconfigurability of Manufacturing Systems (2)
Location: **615A**
Chair: **Khaled Medini**

Practical Boundary Case Approach for Kanban Calculation on the Shop Floor Subject to Variation

<u>Christoph Roser</u>[1], Daniel Nold[2]
1: Karlsruhe University of Applied Science, Germany; 2: Dr. Ing. h.c. F. Porsche AG

Sketching the Landscape for Lean Digital Transformation

Alireza Ashrafian[1], Daryl J. Powell[1], Jonas A. Ingvaldsen[1], Heidi C. Dreyer[1], Halvor Holtskog[1], Peter Schütz[1], Elsebeth Holmen[1], Ann-Charlott Pedersen[1], Eirin Lodgaard[2]
1: Norwegian University of Science and Technology, Norway; 2: SINTEF Raufoss Manufacturing, Norway

Options for Maintaining Weakened FIFO in Parallel Queues

Kalkanci Kaan, <u>Christoph Roser</u>
Karlsruhe University of Applied Science, Germany

Simulation of Reconfigurable Assembly Cells with Unity3D

<u>Magdalena Paul</u>, Daria Leiber, Julian Pleli, Gunther Reinhart
Institute for Machine Tools and Industrial Management, Technical University of Munich, Germany

Modular Robot Software Framework for the Intelligent and Flexible Composition of its Skills

<u>Lisa Heuss</u>[1], Andreas Blank[2], Sebastian Dengler[1], Georg Lukas Zikeli[2], Gunther Reinhart[1], Jörg Franke[2]
1: Institute for Machine Tools and Industrial Management (iwb), Technical University Munich, Germany; 2: Institute for Factory Automation and Production Systems (FAPS), Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Simple Assembly Line Balancing Problem with Power Peak Minimization

<u>Paolo Gianessi</u>[1], Xavier Delorme[1], Oussama Masmoudi[2]

1: Mines Saint-Étienne, Saint-Étienne, France; 2: University of Technology of Troyes, Troyes, France

Cyber-Physical Waste Identification and Elimination Strategies in the Digital Lean Manufacturing World

David Romero[1], Paolo Gaiardelli[2], Matthias Thürer[3], Daryl Powell[4], Thorsten Wuest[5]
1: Tecnológico de Monterrey, Mexico; 2: University of Bergamo, Italy; 3: Jinan University, China; 4: Norwegian University of Science and Technology, Norway; 5: West Virginia University, USA

A DRC Scheduling for Social Sustainability: Trade-off between Tardiness and Workload Balance

Muhammad Akbar[1,2], Takashi Irohara[1]
1: Department of Information and Communication Sciences, Sophia University, Japan; 2: Department of Industrial Engineering, Bandung Institute of Technology, Indonesia

Lean and Digitalization: Contradictions or complements?

Rafael Lorenz[1], Paul Buess[2], Julian Macuvele[2], Thomas Friedli[2], Torbjörn H. Netland[1]
1: ETH Zurich, 8006 Zurich, Switzerland; 2: University of St. Gallen, 9000 St. Gallen, Switzerland

Supply Chain Planning and Optimization (2)
Location: **615B**
Chair: **R.M. Chandima Ratnayake**

Supply Chain Scenarios for Logistics Service Providers in the Context of Additive Spare Parts Manufacturing

Daniel Pause, Svenja Marek
FIR at Aachen University, Germany

Collaborative Exchange of Cargo Truck loads: Approaches to reducing empty trucks in logistics chains

Hans-Henrik Hvolby[1], Kenn Steger-Jensen[1], Mihai Neagoe[2], Sven Vestergaard[1], Paul Turner[2]
1: Aalborg University, Denmark; 2: University of Tasmania, Hobart

An Integrated Approach for Supply Chain Tactical Planning and Cash Flow Valuation

Asma Rakiz[1,2], Kawtar Retmi[1], Sabah Belil[1,3]
1: Emines-Mohammed VI Polytechnic University; 2: PARIS II PANTHÉON-ASSAS UNIVERSITY; 3: LIMOS CLERMONT AUVERGNE UNIVERSITY

Supply Chain Optimization in the Tire Industry: State-of-the-art

R.M. Chandima Ratnayake[2], Kartika Nur Alfina[1]
1: University of Indonesia, Depok, Indonesia; 2: Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, Stavanger, Norway

| 4:00pm - 5:15pm | **Plenary Session 1: Emerging Challenges and Research Opportunities in Smart Services**
Location: **Salon J**
Chair: **Vittaldas Prabhu** |

8:30am - 10:00am

Knowledge Management in Design and Manufacturing
Location: **616B**
Chair: **Melissa Demartini**

Modeling Manual Assembly System to Derive Best Practice from Actual Data
Susann Kärcher[1], David Görzig[2], Thomas Bauernhansl[1,2]
1: Fraunhofer IPA, Nobelstrasse 12, 70569 Stuttgart, Germany; 2: IFF University of Stuttgart, Nobelstrasse 12, 70569 Stuttgart, Germany

Application of a Controlled Assembly Vocabulary: Modeling a Home Appliance Transfer Line
E. Chase Wentzky, Chelsea Spence, Apurva Patel, Nicole Zero, Adarsh Jeyes, Alexis Fiore, Joshua D. Summers, Mary E. Kurz, Kevin Taaffe
Clemson University, United States of America

What the Product Developer Really Needs to Know - Capturing the Major Design Elements
Bjørnar Henriksen, Andreas Landmark, Carl Christian Røstad
SINTEF, Norway

Closed-Loop Manufacturing for Aerospace Industry: PLM and MOM solutions support the wing box assembly process
Islam Abusohyon[1], Melissa Demartini[1], Federico Galluccio[2], Raffaello Lepratti[3], Paolo Mattis[2], Flavio Tonelli[1]
1: University of Genoa, via Opera Pia 15, 16145, Genoa, Italy; 2: Siemens Italy S.p.A., Via Enrico Melen 83, 16152, Genoa, ITALY; 3: Siemens AG., Gleiwitzerstr. 555, 90475 Nuremberg, GERMANY

Industry 4.0 Implementations
Location: **616A**
Chair: **Vidosav Majstorovic**

Implementation of Industry 4.0 in Germany, Brazil and Portugal: Barriers and Benefits
Walter C. Satyro[1], Mauro de Mesquita Spinola[1], Jose Benedito Sacomano[2], Márcia Terra da Silva[2], Rodrigo Franco Gonçalves[1,2], Marcelo Pessoa[1], Jose Celso Contador[3], Jose Luiz Contador[4], Luciano Schiavo[1]
1: Polytechnic School of USP – Universidade de Sao Paulo, Brazil; 2: UNIP – Universidade Paulista, Postgraduate Program in Production Engineering; 3: UNIP – Universidade Paulista, Postgraduate Program in Administration; 4: FACCAMP - Faculdade Campo Limpo Paulista, Postgraduate Program in Administration

Planning Guideline and Maturity Model for Intralogistics 4.0 in SME
Knut Krowas[2], Ralph Riedel[1]

Collaborative Technology (1)
Location: **615B**
Chair: **Volker Stich**

Approach for Detecting and Anticipating Collaboration Opportunities
Ibrahim Koura[1], Frederick Benaben[1], Juanqiong Gou[2]
1: IMT Mines Albi, France; 2: Beijing Jiaotong University,China

Systematic Integration of Stakeholders in Factory Planning, Construction and Factory Operations to Increase Acceptance and Prevent Disruptions
Uwe Dombrowski, Alexander Karl, Colette Vogeler, Nils Bandelow
Technische Universität Braunschweig, Germany

Design and Simulation of an Integrated Model for Organisational Sustainability applying the Viable System Model and System Dynamics
Sergio Gallego García, Manuel García García
UNED National Distance Education University, Spain

Service Engineering Models: History and Present-Day Requirements
Jan Kuntz, Roman Senderek, Volker Stich, Jana Frank
FIR an der RWTH Aachen, Germany

Supply Chain Planning and Optimization (3)
Location: **615A**
Chair: **JOAO GILBERTO MENDES DOS REIS**

UAV Set Covering Problem for Emergency Network
Young Soo Park[1], Ilkyeong Moon[1,2]
1: Department of Industrial Engineering, Seoul National University, Korea, Republic of (South Korea); 2: Institute for Industrial Systems Innovation, Seoul National University, Korea, Republic of (South Korea)

A Stochastic Optimization Model for Commodity Rebalancing under Traffic Congestion in Disaster Response
Xuehong Gao
Pusan National University, Busan, Republic of (South Korea)

1: Chemnitz University of Technology, Germany; 2: TUCed Affiliated Institute for Transfer and Continuing Education

Self-Assessment of Industry 4.0 Technologies in Intralogistics for SME's

Martina Schiffer, Hans-Hermann Wiendahl, Benedikt Saretz

Fraunhofer Institute for Manufacturing Engineering and Automation IPA, Germany

Industry 4.0 Visions and Reality- Status in Norway

Hans Torvatn, Pål Kamsvåg, Birgit Kløve

SINTEF Digital

The Impact of Energy Management Systems on Industry 4.0 Concepts: Evidence from Serbian Manufacturing Companies

Milovan Medojevic[1], Nenad Medic[1], Ugljesa Marjanovic[1], Bojan Lalic[1], Vidosav Majstorovic[2]

1: University of Novi Sad, Serbia; 2: University of Belgrade, Serbia

Optimal Supplier Selection in a Supply Chain with Predetermined Loading/unloading Time Windows and Logistics Truck Share

ALIREZA FALLAHTAFTI[1], Iman Ghalehkhondabi[2], Gary R. Weckman[1]

1: OHIO UNIVERSITY, United States of America; 2: School of Business and Leadership, Our Lady of the Lake University, San Antonio

Passenger Transport Disutilities in The US: An analysis since 1990s

Helcio Raymundo, João Gilberto Mendes dos Reis

Universidade Paulista, Brazil

Port Efficiency to Commodities Transportation: An Analysis in Port of Santos, Brazil

Renato Marcio dos Santos, João Gilberto Mendes dos Reis, Júlio Cesar Raymundo, Emerson Rodolfo Abraham, Ataíde Pereira Cardoso Júnior, Aguinaldo Eduardo de Souza

Paulista University - UNIP, Brazil

10:30am - 12:00pm	**Plenary Session 1: Towards Smart Production Management Systems: Things, Services and People** Location: **Salon J** Chair: **David Romero** Chair: **Boonserm (Serm) Kulvatunyou**	
1:15pm - 2:45pm	**Collaborative Product Development** Location: **616B** Chair: **Boonserm (Serm) Kulvatunyou**	**ICT for Collaborative Manufacturing** Location: **616A** Chair: **Daryl John Powell**

Knowledge Management Environment for Collaborative Design in Product Development

Shuai Zhang

University of Greenwich, United Kingdom

A Multi-criteria Approach to Collaborative Product-Service Systems Design

Martha Orellano[1], Khaled Medini[2], Christine Lambey-Checchin[3], Maria-Franca Norese[4], Gilles Neubert[5]

1: Mines Saint-Etienne, Univ Lyon, Univ Jean Moulin, Univ Lumire, Univ Jean Monnet, ENTPE, INSA Lyon, ENS Lyon, CNRS, UMR 5600 EVS, Institut Henri Fayol, F-42023, Saint-Etienne, France.; 2: Mines Saint-Etienne, Univ Clermont Auvergne, CNRS, UMR 6158 LIMOS, Institut Henri Fayol, F 42023, Saint-Etienne, France; 3: Univ Clermont Auvergne, EA3849 CleRMa, F-63008, Clermont-Ferrand, France; 4: Politecnico di Torino, DIGEP, Torino, Italy; 5: emlyon business school, CNRS, UMR 5600 EVS, F-42009, Saint-Etienne, France

Design-for-Cost – An Approach for Distributed Manufacturing Cost Estimation

Minchul Lee, Boonserm Kulvatunyou

Identifying the Role of Manufacturing Execution Systems in the IS landscape: A Convergence of Multiple Types of Application Functionalities

Sabine Waschull, J.C. Wortmann, J.A.C. Bokhorst

University of Groningen, Netherlands, The

A Generic Approach to Model and Analyze Industrial Search Processes

Philipp Steenwerth, Hermann Lödding

Hamburg University of Technology, Germany

A Methodology to Assess the Skills for an Industry 4.0 factory

Federica Acerbi, Silvia Assiani, Marco Taisch

Politecnico di Milano, Italy

MES Implementation: Critical Success Factors and Organizational Readiness Model

Daniela Invernizzi[1], Paolo Gaiardelli[1], Emrah Arica[2], Daryl Powell[3]

National Institutes of Standard and Technology, United States of America

1: University of Bergamo, Italy; 2: Sintef Digital, Norway; 3: Norwegian University of Science and Technology, Norway

Machine Learning in Production Management
Location: **615A**
Chair: **Kenn Steger-Jensen**

Workflow and Inventory Planning
Location: **615B**
Chair: **Hans-Henrik Hvolby**

Enabling energy efficiency in manufacturing environments through deep learning approaches: Lessons learned
M.T. Alvela Nieto, E. G. Nabati, D. Bode, M. A. Redecker, A. Decker, K.-D. Thoben
University of Bremen (Germany), Department of Production Engineering, BIK- Institute for Integrated Product Development

Possibilities and Benefits of Using Material Flow Information to Improve the Internal Hospital Supply Chain
Giuseppe Ismael Fragapane, Aili Biriita Bertnum, Jan Ola Strandhagen
Norwegian University of Science and Technology, Norway

A Data Mining Approach to Support Capacity Planning for the Regeneration of Complex Capital Goods
Melissa Seitz, Maren Sobotta, Peter Nyhuis
Leibniz University Hannover, Germany

Combining the Inventory Control Policy with Pricing and Advertisement Decisions for a Non-instantaneous Deteriorating Product
Reza Maihami, Iman Ghalehkhondabi
Our lady of the Lake University, United States of America

Developing Smart Supply Chain Management Systems Using Google Trend's Search Data: A Case Study
Ramin Sabbagh, Dragan Djurdjanovic
The University of Texas at Austin, United States of America

Inventory Control at the Point-Of-Use in Hospitals
Giuseppe Fragapane, Aili Biriita Bertnum, Hans-Henrik Hvolby, Jan Ola Strandhagen
Norwegian University of Science and Technology, Norway

Retail Promotion Forecasting: A Comparison of Modern Approaches
Casper Solheim Bojer[1], Iskra Dukovska Popovska[1], Flemming Max Møller Christensen[1], Kenn Steger-Jensen[1,2]
1: Aalborg University, Denmark; 2: University College of Southeast Norway, Norway

Assessing Fit of Capacity Planning Methods for Delivery Date Setting: An ETO Case Study
Swapnil Bhalla[1], Erlend Alfnes[1], Hans-Henrik Hvolby[1,2]
1: Department of Mechanical and Industrial Engineering, Norwegian University of Science and Technology, Trondheim, Norway; 2: Department of Materials and Production, Centre for Logistics, Aalborg University, Aalborg, Denmark

Scheduling Auction: A New Manufacturing Business Model for Balancing Customization and Quick Delivery
Shota Suginouchi, Hajime Mizuyama
Aoyama Gakuin University, Japan

3:30pm - 5:00pm	**Closing Ceremony** Location: **Salon J**

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