

8th International Conference on Digital Enterprise Technology (DET 2014)

Disruptive Innovation in Manufacturing Engineering towards the 4th Industrial Revolution

Procedia CIRP Volume 25

**Stuttgart, Germany
25 – 28 March 2014**

Editors:

**C. Constantinescu
W. Bauer**

**O. Sauer
P. Maropoulos**

ISBN: 978-1-63439-765-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Editorial Preface	1
Assessment of Dynamics and Risks in Supplier Selection Processes	2
<i>Stefan Ruhrmann, Jan Hochdörffer, Gisela Lanza</i>	
An Integrated Decision Making Framework for Automotive Product Development with the Supply Chain	10
<i>Syed M. Hasan, James Gao, Muhammad Wasif, Syed A. Iqbal</i>	
An Exploration into Measurement Consistency on Coordinate Measuring Machines	19
<i>Per Saunders, Alan Wilson, Nick Orchard, Neil Tatman, Paul Maropoulos</i>	
CAI Model for Prismatic Parts in Digital Manufacturing	27
<i>Vidosav Majstorovic, Tatjana Sibaliija, Marko Ercevic, Bojan Ercevic</i>	
Storage Pricing and Allocation in a Headquarter-managed Centralized Distribution Center	33
<i>Ting Zhang, George Q. Huang, Hao Luo, Runyang Zhong</i>	
3D Digital Reconfiguration of an Automated Welding System for a Railway Manufacturing Application	39
<i>Alessandra Caggiano, Luigi Nele, Emanuele Sarno, Roberto Teti</i>	
A Novel Product Representation to Highlight Cross-assembly Dependencies and Product Robustness	46
<i>Blake A. Kendrick, Stephen T. Newman, Vimal Dhokia</i>	
Evolutionary Optimization of Production Materials Workflow Processes	53
<i>Luke Herbert, Zaza Nadja Lee Hansen, Peter Jacobsen, Pedro Cunha</i>	
Virtual Reality Based Conjoint Analysis for Early Customer Integration in Industrial Product Development	61
<i>Klaus Backhaus, Jonas Jasper, Katharina Westhoff, Jürgen Gausemeier, Michael Grafe, Jörg Stöcklein</i>	
LOPEC – Logistics Personal Excellence by Continuous Self-assessment	69
<i>Andreas Jäger, Jörg Bauer, Vera Hummel, Wilfried Sihm</i>	
Direct Toolpath Generation Based on Graph Theory for Milling Roughing	75
<i>Daniela Popescu, Florin Popister, Sorin Popescu, Calin Neamtu, Mircea Gurzau</i>	
Valuable Use-cases towards a Generic Model of Geo-station Welding	81
<i>Julius F. Klinger, Jonathan Litwar, Martin Bohn, Carmen Constantinescu</i>	
Multi-criteria Assembly Line Design under Demand Uncertainty	86
<i>N. Papakostas, G. Pintzos, C. Giannoulis, N. Nikolakis, G. Chryssolouris</i>	
Usage of Case-based Reasoning in FMEA-driven Software	93
<i>Gabriela Căndeia, Stefania Kifor, Carmen Constantinescu</i>	
A Machining Feature Information Model for Dynamic Manufacturing Planning	100
<i>Xu Liu, Yingguang Li, Qiang Li</i>	
Low-cost Extension of Information Transparency Throughout the Product Life-cycle via Optical Identification and Quality Indication	106
<i>Zsolt Kemény, Sándor Bozóki, Elisabeth Ilie-Zudor, László Monostori</i>	
Identification of Key Temperature Measurement Technologies for the Enhancement of Product and Equipment Integrity in the Light Controlled Factory	114
<i>David Ross-Pinnock, Paul G. Maropoulos</i>	
Intelligent Composite Layup by the Application of Low Cost Tracking and Projection Technologies	122
<i>Matthew Such, Carwyn Ward, Windo Hutabarat, Ashutosh Tiwari</i>	
A Novel Approach for the Combined Use of AR Goggles and Mobile Devices as Communication Tools on the Shopfloor	132
<i>G. Pintzos, L. Rentzos, N. Papakostas, G. Chryssolouris</i>	
Comparison of the Measurement Performance of High Precision Multi-axis Metal Cutting Machine Tools	138
<i>M. R. Verma, E. Chatzivagiannis, D. Jones, P. G. Maropoulos</i>	
Simulation of the Laser Beam Melting Process – Approaches for an Efficient Modelling of the Beam-material Interaction	146
<i>C. Seidel, M. F. Zaeh, M. Wunderer, J. Weirather, T. A. Krol, M. Ott</i>	
Short-term Cyber-physical Production Management	154
<i>Günther Schuh, Till Potente, Christina Thomas, Thomas Hempel</i>	
Dynamic Alignment Control Using Depth Imagery for Automated Wheel Assembly	161
<i>Vinayak A. Prabhu, Ashutosh Tiwari, Windo Hutabarat, John Thrower, Christopher Turner</i>	

Large Volume Metrology Technologies for the Light Controlled Factory	169
<i>J. E. Muelaner, P. G. Maropoulos</i>	
Production Resource Search Using the Viral Phenomenon: Concept Introduction	177
<i>Gašper Škulj, Rok Vrabec, Peter Butala, Alojzij Sluga</i>	
Capacity Planning and Resource Allocation in Assembly Systems Consisting of Dedicated and Reconfigurable Lines	185
<i>Dávid Gyulai, Botond Kádár, László Monostori</i>	
Integration Architecture of Intelligent Maintenance Systems and Spare Parts Supply Chain Planning	192
<i>Thiago Regal Da Silva, Philipp Saalman, Ann-Kristin Cordes, Anderson Giacomolli, Carlos Eduardo Pereira, Bernd Hellingrath</i>	
Research on Rework Strategies for Reconfigurable Manufacturing System Considering Mission Reliability	199
<i>Wei Dai, Jian Chu, Paul G. Maropoulos, Yu Zhao</i>	
Integrating Pointing Gesture Detection for Enhancing Brainstorming Meetings Using Kinect and PixelSense	205
<i>Andreas Kunz, Ali Alavi, Philipp Sinn</i>	
Simulation in Manufacturing: Review and Challenges	213
<i>D. Mourtzis, M. Doukas, D. Bernidaki</i>	
Conceptual Design of a Self-optimising Production Control System	230
<i>T. Mittag, J. Gausemeier, I. Graessler, P. Iwanek, D. Koehling, M. Petersen</i>	
Simulation Based Decision Support Systems: An Industrial End-user Based Requirement Gathering Process	238
<i>Ivor Lanning, Cathal Heavey, Stefan Heilmayer, Can Sun, John Geraghty</i>	
Modeling of System Knowledge for Efficient Agile Manufacturing: Tool Evaluation, Selection and Implementation Scenario in SMEs	246
<i>C. L. Constantinescu, D. Matarazzo, D. Dienes, E. Francalanza, M. Bayer</i>	
Implementing ManPy, a Semantic-free Open-source Discrete Event Simulation Package, in a Job Shop	253
<i>Oladipupo Olaitan, John Geraghty, Paul Young, Georgios Dagkakis, Cathal Heavey, Martin Bayer, Jerome Perrin, Sebastien Robin</i>	
Simulation-based Decision Support Tools for Demand Disaggregation in a Supply Chain Characterised by High Routing Flexibility	261
<i>Anna Rotondo, Paul Young, John Geraghty, Stefan Heilmayer, Can Sun</i>	
Information Support and Interactive Planning in the Digital Factory: Approach and Industry-driven Evaluation	269
<i>C. L. Constantinescu, E. Francalanza, D. Matarazzo, O. Balkan</i>	
Test Implementation and Initialisation of a Simulation Model Using CMSD	276
<i>Panagiotis Barlas, Georgios Dagkakis, Cathal Heavey, Brendan Gaffney, Paul Young, John Geraghty</i>	
From COTS Simulation Software to an Open-source Platform: A Use Case in the Medical Device Industry	283
<i>Georgios Dagkakis, Anna Rotondo, Ioannis Papagiannopoulos, Cathal Heavy, John Geraghty, Paul Young, Rob Holland</i>	
Information Technology for the Factory of the Future – State of the Art and Need for Action	293
<i>Olaf Sauer</i>	
Interoperability between OPC UA and AutomationML	297
<i>Robert Henßen, Miriam Schleipen</i>	
Automatic Conformance Test Generation Based on a Verified Model of a Bus System Standard	305
<i>Armin Lechler, Tomas Macias, Agus Atmosudiro</i>	
Pattern-based Business Model Development for Cyber-Physical Production Systems	313
<i>Vinzent Rudtsch, Jürgen Gausemeier, Judith Gesing, Tobias Mittag, Stefan Peter</i>	
Cloud-based Platform to Facilitate Access to Manufacturing IT	320
<i>Daniel Stock, Matthias Stöhr, Ursula Rauschecker, Thomas Bauernhansl</i>	
Cloud-based Auction Tower for Perishable Supply Chain Trading	329
<i>Meng Cheng, Hao Luo, Ray Y. Zhong, Shulin Lan, George Q. Huang</i>	
A Solution for Information Management in Logistics Operations of Modern Manufacturing Chains	337
<i>Elisabeth Ilie-Zudor, Zsolt Kemény, Anikó Ekárt, Christopher D. Buckingham, László Monostori</i>	
Competences for Cyber-physical Systems in Manufacturing – First Findings and Scenarios	345
<i>Bernd Dworschak, Helmut Zaiser</i>	
Digital Planning of Harmonised Quality Testing Activities throughout the Product Life Cycle	351
<i>Jan Kukulies, Bjoern Falk, Robert Schmitt</i>	
Process-oriented Semantic Knowledge Management in Product Lifecycle Management	361
<i>Artur Felic, Birgitta König-Ries, Michael Klein</i>	

Towards a PLM Interoperability for a Collaborative Design Support System	369
<i>Diana Penciu, Alexandre Durupt, Farouk Belkadi, Benoît Eynard, Harvey Rowson</i>	
Towards a Role-centric and Context-aware Information Distribution System for Manufacturing	377
<i>Kosmas Alexopoulos, Sotiris Makris, Vangelis Xanthakis, Konstantinos Sipsas, Aggelos Liapis, George Chryssolouris</i>	
Evaluating a Prototype Approach to Validating a DDS-based System Architecture for Automated Manufacturing Environments	385
<i>M. S. Essers, T. H. J. Vaneker</i>	
Optimisation of Weld Seam Configurations Using a Genetic Algorithm	393
<i>Philipp A. Schmidt, Thomas Pauleser, Michael F. Zaeh</i>	
Minimizing Energy Consumption for Robot Arm Movement	400
<i>Abdullah Mohammed, Bernard Schmidt, Lihui Wang, Liang Gao</i>	
Machine Availability Monitoring for Adaptive Holistic Scheduling: A Conceptual Framework for Mass Customization	406
<i>D. Mourtzis, M. Doukas, A. Vlachou, N. Xanthopoulos</i>	
Engineering Innovation Factory	414
<i>Gunilla Sivard, Navid Shariatzadeh, Lars Lindberg</i>	
Concept of a Failures Management Assistance System for the Reaction on Unforeseeable Events during the Ramp-up	420
<i>W. Bauer, O. Ganschar, B. Pokorni, S. Schlund</i>	
Enterprise Competency Modelling in Practice-an Exploratory Case Study	426
<i>Reza Vatankhah Barenji, Majid Hashemipour, David A. Guerra-Zubiaga</i>	
Rapid Machine Tool Verification	431
<i>J. E. Muelaner, B. R. Yang, C. Davy, M. R. Verma, P. G. Maropoulos</i>	
Author Index	