

# **2nd CIRP Robust Manufacturing Conference**

**(RoMac 2014)**

**Procedia CIRP Volume 19**

**Bremen, Germany  
7 – 9 July 2014**

**Editors:**

**K. Windt**

**ISBN: 978-1-63439-362-1**

**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. (2014)

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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Design and Planning of Manufacturing Networks for Mass Customisation and Personalisation: Challenges and Outlook</b> .....	1
<i>D. Mourtzis, M. Doukas</i>	
<b>Transferability of Self-Healing Principles to the Recovery of Supply Network Disruptions – The Case of Renesas Electronics</b> .....	14
<i>Marie Brüning, J. Henning Buchholz, Julia Bendul</i>	
<b>Towards an Understanding of the Relation between Topological Characteristics and Dynamic Behavior in Manufacturing Networks</b> .....	21
<i>Moritz E. Beber, Till Becker</i>	
<b>Geographical Risk Assessment from Tsunami Run-up Events based on Socioeconomic-environmental Data and its Application to Japanese Air Transportation</b> .....	27
<i>Aki-Hiro Sato, Hidefumi Sawai</i>	
<b>Early Indication System for Critical Situations in Job-shop Production</b> .....	33
<i>Marius-Vasile Apostu, Mirja Meyer, Julia Bendul</i>	
<b>Event-based Supply Chain Early Warning System for an Adaptive Production Control</b> .....	39
<i>E. Genc, N. Duffie, G. Reinhart</i>	
<b>Further Development of the Stuttgart Enterprise Model in Terms of the Applicability to Global Manufacturing Networks</b> .....	45
<i>Tobias Tauterat, Nils Schmeinck, Stefan Keckl, Martin Mikusz</i>	
<b>Collaboration Mechanisms to Increase Productivity in the Context of Industrie 4.0</b> .....	51
<i>Günther Schuh, Till Potente, Cathrin Wesch-Potente, Anja Ruth Weber, Jan-Philipp Prote</i>	
<b>Strategic Evaluation of Technological Capabilities, Competencies and Core-Competencies of Manufacturing Companies</b> .....	57
<i>Josef Greitemann, Elias E. Christ, Anna C. Matzat, Gunther Reinhart</i>	
<b>Reliable Shop Floor Bottleneck Detection for Flow Lines through Process and Inventory Observations</b> .....	63
<i>C. Roser, K. Lorentzen, J. Deuse</i>	
<b>Method for a Systematic Evaluation of Advanced Complexity Management Maturity</b> .....	69
<i>Andreas Kluth, Jens Jäger, Anja Schatz, Thomas Bauernhansl</i>	
<b>Robust Parameter Setting of Supply Chain Flexibility Measures Using Distributed Evolutionary Computing</b> .....	75
<i>Jan-Hendrik Fischer, Dominik Pfeiffer, Bernd Hellgrath, Luiz Felipe Scavarda, Roberto Antonio Martins</i>	
<b>Flexibility based Assessment of Production System Robustness</b> .....	81
<i>Nils Luft, Christoph Besenfelder</i>	
<b>The Concept of Robustness in Production Systems and its Correlation to Disturbances</b> .....	87
<i>N. Stricker, G. Lanza</i>	
<b>Robust Methods for the Prediction of Customer Demands based on Nonlinear Dynamical Systems</b> .....	93
<i>Mirko Kück, Bernd Scholz-Reiter, Michael Freitag</i>	
<b>Robust Capacity Planning for the Delivery of Industrial Product-service Systems</b> .....	99
<i>Henning Lagemann, Horst Meier</i>	
<b>Implementation of Resilient Production Systems by Production Control</b> .....	105
<i>Matthias Heinicke</i>	
<b>Production Phase-out During Plant Shutdown</b> .....	111
<i>Regina Grussenmeyer, Sükran Gencay, Thorsten Blecker</i>	
<b>Vehicle Routing under Consideration of Transshipment in Horizontal Coalitions of Freight Carriers</b> .....	117
<i>Benedikt Vornhusen, Xin Wang, Herbert Kopfer</i>	
<b>Stability-based Short-term Capacity Requirement Planning under Uncertainty</b> .....	123
<i>Haruhiko Suwa, Daisuke Morita</i>	
<b>The Effect of Learning Factors due to Low Volume Order Fluctuations in the Automotive Wiring Harness Production</b> .....	129
<i>Justinas Tilindis, Vytautas Kleiza</i>	
<b>The Demand Absorption Coefficient of a Production Line</b> .....	135
<i>Jose Antonio Heredia Álvaro, Antonio Estruch Ivars</i>	
<b>Achieving Higher Scheduling Accuracy in Production Control by Implementing Integrity Rules for Production Feedback Data</b> .....	142
<i>Günther Schuh, Christina Thomas, Annika Hauptvogel, Felix Brambring</i>	
<b>A Robust Scheduling Approach for a Single Machine to Optimize a Risk Measure</b> .....	148
<i>Marcello Urgo, József Váncza</i>	

<b>Performance Measurement for Robust and Agile Scheduling and Control of Industrial Product-Service Systems</b> .....	154
<i>Friedrich Morlock, Thomas Dorka, Horst Meier</i>	
<b>Knowledge Enriched Short-term Scheduling for Engineer-to-order Products</b> .....	160
<i>D. Mourtzis, M. Doukas, K. Vlachou, K. Fragou, C. Vandera</i>	
<b>Optimal Dynamic Behavior of Adaptive WIP Regulation with Multiple Modes of Capacity Adjustment</b> .....	168
<i>A. Chehade, N. Duffie</i>	
<b>Comparison of Two Integer Programming Formulations for a Single Machine Family Scheduling Problem to Minimize Total Tardiness</b> .....	174
<i>Oliver Herr, Asvin Goel</i>	
<b>Distributed Key Figure Optimization Approaches for Global Goal Coordination in Multi-agent Systems for Production Control</b> .....	180
<i>Florian Pantke, Otthein Herzog</i>	
<b>Author Index</b>	