



OTTO VON GUERICKE  
UNIVERSITÄT  
MAGDEBURG

ILM

# 11<sup>th</sup> INTERNATIONAL DOCTORAL STUDENTS WORKSHOP ON LOGISTICS

JUNE 19, 2018  
MAGDEBURG

**Publisher:**

Univ.-Prof. Dr.-Ing. habil. Prof. E. h. Dr. h. c. mult. Michael Schenk

**In cooperation with:**



**Fraunhofer**  
IFF

**With the support of:**



**alliance**



This project has received funding from the  
*European Union's Horizon 2020 research and  
innovation programme* under grant agreement  
No 692426

# TABLE OF CONTENTS

<b>Foreword</b>	<b>7</b>
Univ.-Prof. Dr.-Ing. habil. Prof. E. h. Dr. h. c. mult. Michael Schenk Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg, Germany	
<b>Introducing the Universities</b>	<b>9</b>
<b>Academic Research and Writing</b>	<b>19</b>
<b><i>The Dissertation: Way and Aim</i></b>	<b>21</b>
Prof. Dr.-Ing. habil. Prof. E. h. Dr. h. c. mult. Michael Schenk Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany Fraunhofer Institute for Factory Operation and Automation IFF, Magdeburg, Germany	
Dr.-Ing. Dr. h. c. (UCLV) Eike Glistau Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany	
Dr.-Ing. Sebastian Trojahn Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany	
<b>Scientific Papers</b>	<b>29</b>
<b><i>A Combination of Simulation and Genetic Algorithm for Solving a Stochastic Inventory Optimization Problem</i></b>	<b>31</b>
Ilya Jackson, PhD student Department of Mathematical Methods and Modelling Transport and Telecommunication Institute, Latvia	
PD Dr. rer. nat. habil. Juri Tolujew Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany Transport and Telecommunication Institute, Riga, Latvia	
<b><i>A Short Survey of Image Processing in Logistics</i></b>	<b>37</b>
Dipl.-Sporting Dipl.-Ing. Hagen Borstell Institute of Logistics and Material Handling Systems Otto von Guericke University Magdeburg, Germany	

***Application of Predictive Analysis to Logistic Processes in General Cargo Warehouses*** **43**

Dipl.-Inf. Andreas Neubert  
Logistik Competence Center  
PKE Deutschland GmbH, Germany

***Continuous Improvement of Lean Processes with Industry 4.0 Technologies*** **49**

M.Sc. Sven Rittberger  
Technology Centre for Production and Logistics Systems (PULS)  
Landshut University of Applied Sciences, Germany

Prof. Dr. Markus Schneider  
Technology Centre for Production and Logistics Systems (PULS)  
Landshut University of Applied Sciences, Germany

***Design Aspects of Last Mile Logistics Solutions*** **55**

János Juhász, PhD student  
Institute of Logistics  
University of Miskolc, Hungary

Tamás Bányai, PhD  
Institute of Logistics  
University of Miskolc, Hungary

***Designing the Consolidation Network of Used Batteries*** **61**

Tatiana Solianyk  
Department of Information Control Systems/ Aircraft Control Systems Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Mikhail Dvornikov  
Department of Information Control Systems/ Aircraft Control Systems Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

***Development of a Unique Catalogue of Criteria to Compare Internal Material and Urban Transport Systems*** **67**

M.Sc. Franziska Thomas  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

Univ.-Prof. Dr.-Ing. Hartmut Zadek  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

***Genetic Algorithm in Comparison to ABC Analysis for Warehouse Picking Area Layout Calculation*** **73**

Aleksandrs Avdeikins  
Transport and Telecommunication Institute, Riga, Latvia

Andrejs Simakovs  
Trialto Latvia Ltd., Saulgozi, "Dominante", Latvia

Mihails Savrasovs  
Transport and Telecommunication Institute, Riga, Latvia

***Impact of Industry 4.0 on Automotive Supplier Systems*** **79**

Gábor Nagy, PhD student  
Institute of Logistics  
University of Miskolc, Hungary

Ágota Tóth Bányainé, PhD  
Institute of Logistics  
University of Miskolc, Hungary

Béla Illés, Prof. Dr.  
Institute of Logistics  
University of Miskolc, Hungary

***Logical Choice Method among Positions in Double Operation Cycle of the Storage Vehicle*** **85**

M.Sc. Thanh Dung Cao  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

Univ.-Prof. Dr.-Ing. Hartmut Zadek  
Institute of Logistics and Material Handling System  
Otto von Guericke University Magdeburg, Germany

***Logistical Risks of Industrial Cooperation of the Virtual Enterprise within B2B Relations*** **91**

Anastasiia Bezsmertna  
Department of Theoretical Mechanics and Engineering and Robotic Systems/ Aircraft Engines Faculty  
National Aerospace University "Kharkiv Aviation Institute"

Nataliya Rudenko  
Department of Theoretical Mechanics and Engineering and Robotic Systems/ Aircraft Engines Faculty  
National Aerospace University "Kharkiv Aviation Institute"

Olga Nefedkina  
Department of Foreign languages/Humanities Faculty  
National Aerospace University "Kharkiv Aviation Institute"

***Applying Methods of Artificial Intelligence to Solve Optimization Problems in Production and Logistics*** **97**

M.Sc., M.Sc. Sebastian Lang  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

***Methodology for the Management of Risk in the Storage and Transport of Hazardous Substances*** **103**

Ing. Lissette Concepción Maure  
Industrial Engineering Department, Central University from Las Villas, Cuba

DrC. Félix Abel Goya Valdivia  
Chemical Engineering Department, Central University from Las Villas, Cuba

Prof. Dr.-Ing. Dr. h.c. Norge Isaias Coello Machado  
Mechanical Engineering Department, Central University from Las Villas, Cuba

Dr.-Ing. Dr. h.c. (UCLV) Elke Glistau  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

***Modern Warehouse Automation with GPS and RFID*** **109**

Olga Morozova  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Larysa Pristupa  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Iryna Malykhina  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

***Order Scheduling Optimization Method of Consignment Seller Dietary Supplements Manufacturing Companies*** **113**

Szabolcs Szentesi PhD student  
Institute of Logistics  
University of Miskolc, Hungary

Péter Tamás PhD  
Institute of Logistics  
University of Miskolc, Hungary

Béla Illés Prof. Dr.  
Institute of Logistics  
University of Miskolc, Hungary

***Reduction of the Bullwhip Effect in the Chain of Supply of the Company Labiofam Villa Clara with a Model Vendor Management Inventory (VMI)***

119

Ing. Ernesto González Cabrera  
Industrial Engineering Department, Central University from Las Villas, Cuba

DrC. Roberto Cespón Castro  
Industrial Engineering Department, Central University from Las Villas, Cuba

Prof. Dr.-Ing. Dr. h.c. Norge Isaias Coello Machado  
Mechanical Engineering Department, Central University from Las Villas, Cuba

Dr.-Ing. Dr. h.c. (UCLV) Elke Glistau  
Institute of Logistics and Material Handling Systems  
Otto von Guericke University Magdeburg, Germany

***Simulation and Optimization of Traffic Capacity within a Segment of City Transportation Infrastructure***

125

Olga Morozova  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Vadim Vasilyuk  
EOS Data Analytics, Ukraine

Tetiana Pavlenko  
Department of Economic Theory/Economics and Management Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Volodymyr Polovynko  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

***Warehouse Complex Design based on Fuzzy Modeling***

131

Tetiana Pavlenko  
Department of Economic Theory/Economics and Management Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Olga Morozova  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

Kateryna Pechenizka  
Department of Theoretical Mechanics, Mechanical Engineering and Robotic Systems/Engine Design Faculty  
National Aerospace University "Kharkiv Aviation Institute", Ukraine

<b>Committee of Reviewers</b>	<b>137</b>
<b>List of Authors</b>	<b>138</b>
<b>Impressum</b>	<b>140</b>