

## LogDynamics News August 2016

### Prof. Thoben becomes the Dean of Production Engineering Faculty

LogDynamics spokesman Prof. Dr.-Ing. habil. Klaus-Dieter Thoben has been appointed in April 2016 as the Dean of Faculty 4 'Production Engineering' at the University of Bremen. Prof. Thoben is the head of Institute of Integrated Product Development (BIK and managing director of BIBA – Bremer Institut für Produktion und Logistik. There, he leads the Division of ICT Applications for Production (IKAP).



The research interests of Prof. Thoben include efficient and effective collaborative design and production processes by applying innovative information and communication technologies. The focal points are: collaborative acting of enterprises during distributed design and production processes as well as during the late processes of the product life cycle, such as the usage phase or the recycling phase.

Prof. Thoben is the spokesman of the research cluster LogDynamics since September 2012.

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### Best Paper Award of PLM 2016 Goes to BIBA

For the PLM16 'Marco Garetti Best Paper Award', the Paper 'An IoT fueled DSS for MOL Marine Auxiliaries Management' by Moritz von Stietencron et al. was selected in July 2016. The distinguished Paper has been compiled during the research project 'Innovativ Kraft' at BIBA. It develops an approach for the usage of existing data from the 'Automatic Identification System' (AIS) to improve the management of service activities on ship accessories.



The International Conference on Product Lifecycle Management (PLM) was organised on behalf of the International Federation for Information Processing (IFIP) for the 13th time this year and it took place from the 11th to the 13th of July 2016 at the University of South Carolina in Columbia (SC), USA.

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Details: [www.plm-conference.org](http://www.plm-conference.org)

Photo: Daving Ewing Jr.

Reference: von Stietencron, M., Hribernik, K.A., Røstad, C.C., Henriksen, B., Thoben, K.-D., 2016. An IoT fueled DSS for MOL Marine Auxiliaries Management, in: Harik, R., Rivest, L., Bernard, A., Bouras, A. (Eds.), Product Lifecycle Manage-

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ment, IFIP Advances in Information and Communication Technology. Presented at the 13th International Conference on Product Lifecycle Management, Springer, Berlin Heidelberg (in Press).

**Internet**  
[www.logdynamics.com](http://www.logdynamics.com)

## Projects

### Prof. Drechsler Participates in the New DFG Project 'Farbige Zustände'

The German Research Foundation (DFG) has funded the research of Collaborative Research Centre (SFB) 'Von farbigen Zuständen zu evolutionären Konstruktionsmaterialien' under the leadership of the process engineer Prof. Lutz Mädler from the Faculty of Production Engineering with 10 million Euros.



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The SFB intends to develop a new method for material development. For this purpose, approaches from biomedical and chemical research shall be transferred to the development of construction materials. Instead of using conventional time-consuming examinations to determine microstructural and mechanical material properties, the SFB aims to develop a new high-throughput technology for construction materials. The interdisciplinary research team combines the research areas process engineering, production engineering, materials engineering, informatics, mathematics as well as planning and logistics. Within this project, the working group computer architecture (AGRA) of the University of Bremen under the leadership of LogDynamics member Prof. Drechsler is responsible for two subprojects, 'predictor function' and 'heuristic, static and analytical experiment design'.

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Photo: IWT

### BIBA develops Industry 4.0 Expert Factory 'Autonomous Control in Production and Logistics'

In the scope of the 'Mittelstand 4.0-Kompetenzzentrum 'Mit uns digital! Das Zentrum für Niedersachsen und Bremen' (Industry 4.0 competence centre for small and medium-sized enterprises), BIBA - Bremer Institut für Produktion und Logistik develops an expert factory for 'Autonomous control in production and logistics'. Here, demonstrators, courses and dialog initiatives for digital production and logistics as cost-free offer are developed, especially for small and medium-sized companies. The demonstration and information events will inform companies about Industry 4.0 and to sensitise them for the related topics. The courses shall qualify specialists and executives regarding the future concept Industry 4.0 and support cyber-physical systems in the respective company. Three core topics in the context of Industry 4.0 are covered: mobile technologies and smart products, efficient planning and control of logistic processes and technical systems as well as adaptive systems for a changing environment.



'Mit uns digital! Das Zentrum für Niedersachsen und Bremen' is coordinated by the Hannover Centre for Production Technology and has started at the beginning of 2016 as the first 'Mittelstand 4.0-Kompetenzzentrum' in Germa-

ny. The competence centre wants to offer almost 500 meetings in companies, around 250 courses and about 70 workshops in Lower Saxony and Bremen until the end of 2018. All together 9 learning factories are in development, one at the Hanover fairground. They shall give small and medium-sized companies solid capabilities for the digital future. Over the year, selected contents of the general and expert factories shall travel through Lower Saxony within a Roadshow to raise awareness of the competence centre and to directly present the topic Industry 4.0 to the target group in rural areas as well.

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Details: [www.mitunsdigital.de](http://www.mitunsdigital.de)  
Photo: clabeck.de

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## Optimization of the Pharmaceuticals Supply Chain in Ethiopia

The DAAD and the Ethiopian Ministry of Education have financed a new PhD research as part of their doctoral programme. The aim of the three years project is to develop an integrated mathematical model for solving the simultaneous problem of product selection, supplier selection, and order allocation in the Pharmaceuticals Supply Chain in Ethiopia. The country still struggles to provide all necessary medication to every region. In contrast to Europe, developing countries have different priorities for the supply of pharmaceuticals: for example, the limited budget requires central sourcing in order to get discounts, and expiration caused by excess stock needs to be avoided. The integrated model is intended to answer the question of what products to procure, from which suppliers and how much of each product from each supplier. In the final phase of the project, data from the Ethiopian Pharmaceutical Supply and Fund Agency (PFSA) will be considered to test and verify the applicability the model. It is planned to use the model in the future for pharmaceuticals procurement activities in Ethiopia.

This project will be performed by Getachew Basa with support from the Production Systems and Logistics Systems working group of Prof. Dr. Till Becker. Getachew Basa is a PhD candidate at the International Graduate School for Dynamics in Logistics. He obtained his B.Sc. (2006) and M.Sc. (2012) degree both in Industrial engineering from Mekelle University, Ethiopia and the American University in Cairo, Egypt respectively. In his hometown, he was a lecturer and researcher at the Mekelle University.

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## New Concepts & Technologies for (Further) Training in the Welding Industry

The project 'MESA – Medieneinsatz in der Schweißbranche' is funded by the Federal Ministry of Education and Research (BMBF) in the scope of the programme 'Digitale Medien in der beruflichen Bildung'. MESA examines new concepts and technologies for (further) training in the welding industry. Main research topics are the integration of training simulators and other digital media technologies in qualification processes of welders as well as the realisation of blended-learning concepts, where in-class lectures are combined with virtual learning. The project network works closely together with the DVS (German Welding Society), an enlarged circle of metal processing companies and educational institutions to create project



contents application-related. Beside BIBA as coordinator the ITB, C+P Bildung (Breidenbach) and the BZ Rhein-Ruhr of the Gesellschaft für Schweißtechnik International (GSI) are also involved in the project.

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Photo: C + B Bildung GmbH

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## Smartglasses Shall Ease the Service at Wind Energy Plants



The joint research project of the project partners BIBA –Bremer Institut für Produktion und Logistik, AnyMotion GmbH (Bremen) and COMback GmbH (Oberreichenbach, Baden-Württemberg) is called 'AR Maintenance System'. Its research period is two years and it is funded by the Federal Ministry of Economic Affairs and Energy in the scope of the programme 'Zentrales Innovationsprogramm Mittelstand' (ZIM).

'AR' stands for 'Augmented Reality' and describes the computer-aided expansion of the perception of reality. The project partners develop an assistance system for technicians, which extends the reality using graphic illustrations of data for maintenance processes and which eases the documentation.

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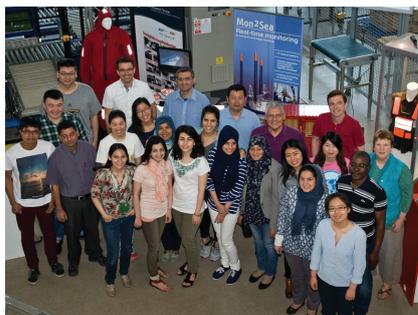
Details: [www.biba.uni-bremen.de](http://www.biba.uni-bremen.de), [www.anymotion.com](http://www.anymotion.com), [www.comback.de](http://www.comback.de)

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## Internationalisation

### Guests from Asia Take Home „Intercultural Spirit“

For three years, the International Graduate School for Dynamics in Logistics (IGS) successfully offers an exchange programme for researchers. Since then, the doctoral training programme of the cross-sectional Bremen Research Cluster for Dynamics in Logistics (*LogDynamics*), in which the faculties of Production



Engineering, Mathematics / Computer Science, Physics / Electrical Engineering and Business Studies / Economics are involved as well as two institutes, includes not only doctoral candidates. 18 young scientists from all qualification levels (Bachelor up to Postdoc) currently perform their research in *LogDynamics* within an Erasmus Mundus exchange.

Ingrid Rügge, managing director of the IGS, successfully acquired third-party funds three times in a row. So far, 36 young Asian scientists and two young German scientists benefited from this. She can be proud of that. The participants of the exchange programme also appreciate the high-level, practice-oriented research topics, the international spirit, the community and the interaction. They will take home their experiences regarding intercultural cooperation and become ambassadors for the University of Bremen.

After several international guests left to their home country this July, in the upcoming semester, we can welcome again some new Erasmus Mundus guests at the University of Bremen and some German researchers will stay in an Asian partner universities.

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## Guest lecture by Dr. Irina Dovbischuk at the DMU

Dr. Irina Dovbischuk will go to Dalian, China to give a lecture at the Transportation and Management College of the Dalian Maritime University (DMU). As a guest lecturer, she will present the topic of 'Transport Economics'. This measure is enabled through the signing of the Memorandum of Understanding between DMU and the University of Bremen, initiated by the Chair of Maritime Business and Logistics in September 2015. The DMU delegates had their first opportunity to meet the *LogDynamics* leading professors in the field of transport and logistics.



From 2015 DMU became a member of Asian-German Knowledge Network for Transport and Logistics e.V., an international association established under the leadership of Dr. Irina Dovbischuk. The lecture exchange is reciprocal, with Dr. Zheng Chang from the DMU coming in December 2016 to the University of Bremen to give lectures on 'Port management and policy'.

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## Guest lecture by Prof. Dr. Agha on Supply Chain Network Optimization

Students at University of Bremen were offered the opportunity between July 11 and 19, 2016 to attend a lecture on 'Supply Chain Network Design' in English language, taught by an international researcher. In collaboration with the Production Systems and Logistic Systems working group, Prof. Dr. Mujtaba Agha from the Capital University of Science and Technology in Islamabad, Pakistan showed interested students how to solve complex distribution problems. Key topic was the implementation of solution procedures of Linear Programming in Excel and scientific optimization tools.



Prof. Agha already visited the IGS in 2014 as a cLink Fellow funded by the Erasmus Mundus programme. This continuous collaboration with *LogDynamics* will strengthen the international profile of the University of Bremen as well.

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## 33rd International Supply Chain Conference – Driving Change



**33. DEUTSCHER  
LOGISTIK-KONGRESS**  
19.-21. Oktober 2016

Date: 19th – 21st of October, 2016  
Venue: Berlin, Germany

The International Supply Chain Conference is today the most important annual logistics event in Europe. It has turned out to be a central meeting point of German economy. But also more foreign guests take part every year to profit from knowledge exchange and concentrated communication possibilities.

The LogDynamics Research Cluster with BIBA will be again this year represented at a booth at the 33rd International Supply Chain Conference. We cordially invite all congress participants, who are interested in innovative solutions for logistics, to visit our booth. The focus of this year's presence will be set on technologies for the realization of Industry 4.0.

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## Sustainability Maritime: Economy, Technology and Ecology – ISL Maritime Conference 2016



Date: 25th of October 2016  
Venue: Schuppen 2, Überseestadt Bremen

The Institute of Shipping Economics and Logistics invites to the ISL Maritime Conference 2016 together with this years' cooperation partners, the Maritime Cluster Northern Germany and the Bremer Senator für Wirtschaft, Arbeit und Häfen. As in previous years, the up to 150 participants can expect interesting lectures, discussions and prognoses concerning the current situation and perspectives of the global maritime industry. In this years' focus of speakers from economy, science and politics are the sustainability in maritime economy as well as the development of shipping markets, harbours and the hinterland.

Contact: [maritimeconference@isl.org](mailto:maritimeconference@isl.org)  
Details and Registration: [www.isl.org/de/conference](http://www.isl.org/de/conference)



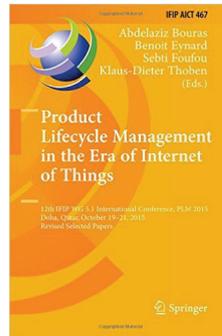
## MCPL 2016 Proceedings Available

The open access articles of the seventh IFAC Conference on Management and Control of Production and Logistics (MCPL) are now available online at [www.sciencedirect.com](http://www.sciencedirect.com) (Keywords: IFAC MCPL 2016). The MCPL was held by LogDynamics in February 2016 together with the fifth International Conference on Dynamics in Logistics (LDIC 2016). The objective is to promote a synergy among different disciplines in order to explore new solutions for complex scientific and technical challenges.

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## PLM 2015 Proceedings Available

The book 'Product Lifecycle Management in the Era of Internet of Things' edited by Abdelaziz Bouras, Benoit Eynard, Sebti Foufou, and Klaus-Dieter Thoben constitutes the refereed proceedings of the 12th IFIP WG 5.1 International Conference on Product Lifecycle Management, PLM 2015, held in Doha, Qatar, in October 2015. The 79 revised full papers were carefully reviewed and selected from 130 submissions.



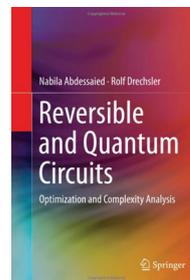
The papers are organized in the following topical sections: smart products, assessment approaches, PLM maturity, building information modeling (BIM), languages and ontologies, product service systems, future factory, knowledge creation and management, simulation and virtual environments, sustainability and systems improvement, configuration and engineering change, education studies, cyber-physical and smart systems, design and integration issues, and PLM processes and applications.

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Available at: [www.springer.com/de/book/9783319331102](http://www.springer.com/de/book/9783319331102)

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## Reversible and Quantum Circuits

The book 'Reversible and Quantum Circuits' written by Nabila Abdessaïed and Rolf Drechsler presents a new optimization flow for quantum circuits realization. At the reversible level, optimization algorithms are presented to reduce the quantum cost. Then, new mapping approaches to decompose reversible circuits to quantum circuits using different quantum libraries are described. Finally, optimization techniques to reduce the quantum cost or the delay are applied to the resulting quantum circuits. Furthermore, this book studies the complexity of reversible circuits and quantum circuits from a theoretical perspective.

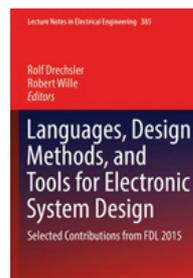


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Available at: [www.springer.com/de/book/9783319319353](http://www.springer.com/de/book/9783319319353)

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## Languages, Design Methods, and Tools for Electronic System Design

The book 'Languages, Design Methods, and Tools for Electronic System Design' edited by Rolf Drechsler and Robert Wille brings together a selection of the best papers from the eighteenth edition of the Forum on specification and Design Languages Conference (FDL), which took place on September 14-16, 2015, in Barcelona, Spain. FDL is a well-established international forum devoted to dissemination of research results, practical experiences and new ideas in the application of specification, design and verification languages to the design, modeling and verification of integrated circuits, complex hardware/software embedded systems, and mixed-technology systems.



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