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Log*Dynamics* Newsletter December 2017

Projects

Automatic Container Handling with Straddle Carriers (STRADegy)

The overall objective of the project STRADegy, which is conducted by EUROGATE and BIBA, is to increase the productivity and flexibility in container handling as well as to reduce the environmental impact and to increase the security of German seaports. Within the project, automated straddle carriers are evaluated in a field test in Europe for the first time. A straddle carrier is a highly flexible freight-carrying vehicle used for stacking and moving standard containers in container terminals. To achieve the research objectives, different concepts are evaluated to ensure a high productivity of the automated system. The developed concepts should also be applicable to a broad range of container terminals. For this purpose, standard interfaces have to be developed to link IT systems from different manufacturers, such as terminal operating systems (TOS), which control the handling processes in terminals. It is also important to ensure that straddle carriers from different providers can be integrated. In this context, BIBA contributes to the design of the pilot experiments and ensures that innovative research approaches are considered throughout all phases of the project. Furthermore, guidelines are prepared that will help to automate mega container terminals in the future. The flagship project STRADegy receives funding from the Federal Ministry of Transport and Digital Infrastructure (BMVI) as part of the program for innovative harbor technologies (IHATEC).

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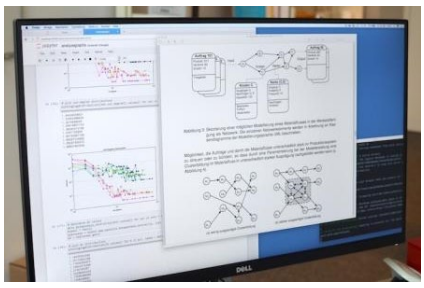
Photo: bremenports

Improvement of Logistics Performance with Cluster-based Decentralized Control in Material Flow Networks (CBS)



The concept of decentrally controlled production and logistic systems has gained a growing importance as part of Industry 4.0. The previous research activities in this area focused mainly on the development of control algorithms for decision-making and the required information and communication technologies. An additional success factor for decentralized control has also been identified:

Bremen Research Cluster for Dynamics in Logistics

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the topology, i.e. the underlying structure of the material flow network. However, the topology has so far not been considered when developing decentralized control approaches. The project is funded by DFG, the German national research foundation, and aims at quantifying the influence of the topology of a material flow network on the logistic performance. Furthermore, it is aspired to investigate how control algorithms need to be configured depending on the network structure. The project started in August 2017.

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Ministry of Education Funds Research Project with South Korea on More Effective Use of Cranes in Container Terminals

The Federal Ministry of Education and Research (BMBF) supports Professor Buer and ISL Applications GmbH. In the three-year international research project „PTOP“, the two project partners, together with researchers from South Korea, intend to develop more effective procedures for planning operational processes in container terminals. PTOP refers to Policy-based Terminal Operations Planning. The decision support system to be developed is intended to help dispatchers to improve the use of rubber tyred gantry cranes within a container yard. Methods of optimization and simulation are combined. The use of the cranes is planned over several working shifts based on the expected workload for the individual bays of container blocks. It has to be decided how many cranes should be working at which locations and when and how heavy cranes should be moved. To unexpected changes in workload, e.g. due to delayed ship arrivals, it must be easy to react. Professor Buer heads the junior research group on Computational Logistics at the University of Bremen. ISL Applications GmbH offers the product CHESSCON, which is an internationally leading software for the simulation of container terminals.

The project partners from Bremen are researching together with partners from Busan, South Korea. Busan is South Korea’s second largest city after Seoul. Like Bremen, it is a maritime center. The port in Busan is the largest container port outside of China and handles approximately as many containers per year as Rotterdam and Hamburg together. The Korean project partners are Professor Soondo Hong of Pusan National University and Total Soft Bank, No. 2 in the Terminal Operating Systems market. They are sponsored by the National Research Foundation Korea, the counterpart to the German DFG. In addition to the content-related cooperation, the project should contribute to further stimulating the scientific and entrepreneurial exchange between Germany and South Korea.

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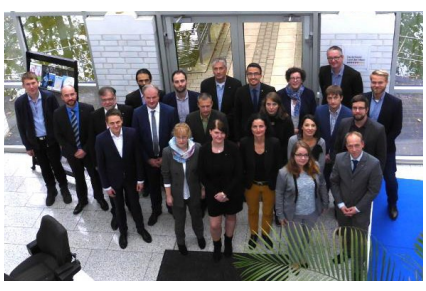
Research and Development Project NSW-Plus Started



On October 11th, the kick-off meeting of the NSW-Plus project took place at the ISL Bremen. The aim of the project, which is coordinated by the Institute of Shipping Economics and Logistics, is an extension of the so-called National Single Window (NSW) as basis for a new ser-

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vice for maritime process optimization. The project is funded within the BMVI support programm Fund.

The vision of NSW-Plus is that stakeholders should have to provide all information relevant to maritime transport, e.g. per journey, port call or container, only once, regardless of Member States, ports and other stakeholders. The existing NSW for Germany will be extended by safety-related and operational data on maritime transports. The result is a new service that brings significant benefits to the economy and serves as a blueprint for other European countries.

Beside ISL, the consortium consists of the Fraunhofer Institut für Kommunikation, Informationsverarbeitung und Ergonomie (FKIE), BESITEC Bertling EDI Service & IT GmbH, TFG Transfracht International Association for Combined Freight Transport mbH, MSC Germany S.A. & Co. KG, data protection cert GmbH and BSH Hausgeräte GmbH.

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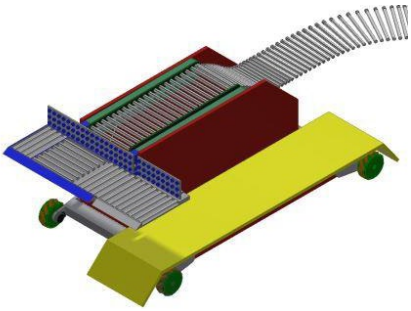
Interactive Robotic System for Unloading of Sea Containers (IRiS)



The unloading of containers is one of the last non-automated activities in a highly-engineered transport chain. A significant proportion of imported and exported containers are emptied or loaded in seaports. Existing automatic and semi-automatic systems do not meet the requirements of port operators due to high investment costs, high commissioning times and adaptations to the infrastructure and have a very low degree of dissemination. The objective of the IRiS project is the development of a new, mobile robot for improving the efficiency of transhipment processes at seaports. The robot should be able to be deployed in a very short time without any major adjustments to the existing operational infrastructure. In order to be able to meet disturbing situations as quickly and effortlessly as possible, an intuitive human-robot interaction interface is developed.

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New EU project UPTIME: Make Production More Efficient with Predictive Maintenance

The use of new production techniques can reduce failure rates and times due to repairs and unplanned equipment downtime. According to estimation by the EU, this may increase the effectiveness of operations by up to 10 percent. The BIBA - Bremer Institut für Produktion und Logistik also sees a great potential for savings in this field and has initiated the project „UPTIME“ with 11 partners from 6 EU countries.

The UPTIME “Unified Predictive Maintenance System” project, is a three-year project, starting in September 2017, with a total budget of more than 6 million euros and is funded by the EU with € 4.8 million under the Horizon 2020 pro-

gramme. The project is under the coordination of BIBA and aims to design a unified predictive maintenance system, which enables implementation of predictive maintenance in manufacturing industries. The UPTIME system will be deployed and validated through implementation in three business cases: white goods home appliances – dryer drum (Whirlpool EMEA, Italy), steel industry – cold rolling machine (M.J. Maillis, Greece) and construction of production systems – transportation jigs (FFT, Germany).

Recognizing potential or likely errors in advance and resolving them at the best possible time with the least possible effort - this is exactly what the UPTIME system is developed for. Using data generated directly from the machines in production, it will be able to generate recommendations for operation. One of the pre-requisites for this is, among other things, intelligent components and the use of sensors, for example via vibration sensors that record vibrations, and report them to the UPTIME system.

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Photo: Maillis

From Laboratory Test to External Mission: System Optimization for the Autonomous Long-term Exploration of the Jupiter‘s Moon Europe

In search of life in our solar system, the Jupiter‘s moon Europa is of great interest: Under a several kilometers thick ice cover, there is a deep ocean suspected that could provide the basis for extraterrestrial life. Scientists from the Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI) have investigated how this ocean can be reached and explored in the project *Europa-Explorer* (*EurEx*). The systems developed for autonomous navigation under water and for transport through the ice will be optimized in the now launched project *EurEx-SiLaNa* for long-term missions outside the laboratory.

The aim of the Europa-Explorer project was to demonstrate, in the context of terrestrial scenarios, that a robot team can autonomously explore the ice moon Europe in Jupiter‘s shadow. There are - so the assumption - under an ice cover in about 100 kilometers of water depth hydrothermal wells that allow by donating heat and minerals even in dark and cold places life. To find these, an exploration vehicle must first penetrate the mighty ice sheet on the surface of the ocean and then reach the bottom of the ocean. For this scenario, the DFKI scientists developed a mission concept that will enable the exploration of the ocean to Europe with the help of a fully autonomous system. Accordingly, they built the autonomous underwater vehicle (AUV) Leng, which can navigate safely through a variety of different sensors in the water, and the IceShuttle Teredo. In order to take the next step in the direction of a real mission - from the laboratory to a natural environment - the project *EurEx-SiLaNa* (*SiLaNa* stands for safe long-term navigation) will further optimize existing systems, their interaction and their navigation performance.

Starting on 1st of September 2017 *EurEX-SiLaNa* is funded by the German Aerospace Center (DLR) and the German Federal Ministry of Economics and Energy (BMWi) of around € 650,000 over a period of 16 months.

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Video: www.youtube.com/watch?v=aT4jWmamPLQ
Photo: DFKI GmbH, Jan Albiez

Autonomous Shunting on the Port Railway (Rang-E)

The project Rang-E is a study to evaluate the feasibility of autonomous shunting operations using the example of port railway Bremerhaven. Technical, economic and legal aspects will be examined. Autonomous maneuvering enables the optimized disposition and operation control of shunting locomotives in the port - both in container handling and in car handling. The terminals in Bremerhaven offer an excellent platform, as Bremerhaven has a high share of rail in hinterland traffic. Various levels of automation, including the complete autonomy and self-control of shunting locomotives will be examined. Rang-E also extends the competence of German port companies with regard to current strategies for digitizing the German economy, such as the Internet of Things (IoT) and Logistics 4.0.

The project „Rang-E - Autonomous maneuvering on the port railway“ is funded by the Federal Ministry of Transport and Digital Infrastructure (BMVI) as part of the funding initiative IHATEC and runs from 01.08.2017 to 31.07.2019. Project partners are: ISL, BIBA and the Institute for Transportation, Railway Construction and Operation (IVE) from Braunschweig.

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Project „BREsilient“ Started - Resilient Future City of Bremen

At the beginning of November, the three-year joint project „BREsilient“ - Resilient Future City of Bremen officially started, with ISL as one of the consortium members. The maritime industry and the directly related logistics companies in Bremen could be significantly affected by climate change in the future. Significant gaps in knowledge exist on the relevance of direct and, above all, indirect (impact on trade flows and value chains) climate impacts. These issues are prepared by the ISL as part of the BREsilient project for the Cluster Maritime Economy / Logistics and communicated to the companies in a target-oriented manner. Relevant research questions are, for example: How do international climate impacts affect the Maritime Economic Cluster in Bremen? Through which adaptation measures can the different actors reduce the vulnerability of the cluster?

Beside ISL, the partners in this project are the Senator for the Environment, Construction and Transport (SUBV, Project Leader), the Institute for Ecological Economy Research GmbH (IÖW) and the Carl von Ossietzky University Oldenburg - Ecological Economics (Uni-OL). The project volume amounts to approx. 2.3 million euros and is funded pro rata by the Federal Ministry of Education and Research (BMBF).

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Personnel Changes

New Log*Dynamics* Member: Prof. Dr. Nicole Megow Provides Expertise in the Area of Optimization

Nicole Megow joined the computer science institute at the University of Bremen as a full professor in August 2016. After her studies at TU Berlin and M.I.T. (Cambridge, US), Nicole Megow received her doctorate in mathematics from TU Berlin in 2006. She was postdoc and senior researcher at the Max Planck Institute for Informatics, Saarbrücken, held a position as interim professor for discrete optimization at TU Darmstadt 2011/12, and headed an Emmy Noether Research Group at TU Berlin. Before joining the University of Bremen, she was an assistant professor for discrete mathematics at TU Munich.

Nicole Megow's main research interests are in the field of combinational optimization, on the design and analysis of efficient algorithms with provable performance guarantees. She and her group contribute with theoretic results and apply them to complex real-world environments, e.g, in production planning and logistics. Her work has won several awards, including the Heinz Maier-Leibnitz Prize by the German Research Foundation (DFG), the Berlin Research Award and the Dissertation Award by the German Operations Research Society (GOR). Nicole Megow joined the interdisciplinary Log*Dynamics* research cluster in August 2017.

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Support for LogDynamics from the Jacobs University: Prof. Yilmaz Uygun

Yilmaz Uygun graduated from FH Südwestfalen (2004) and subsequently form University of Duisburg-Essen (2006) prior to joining TU Dortmund University where he first worked as Research Associate in the field of Production Management and later as Executive Director of the Chair of Factory Organization. After receiving his PhD in 2012 he moved to the United States to conduct postdoctoral research at the Industrial Performance Center (IPC) of the Massachusetts Institute of Technology. In 2016, he was appointed as Professor of Logistics Engineering, Technologies and Processes at Jacobs University Bremen while remaining with the IPC as Research Affiliate. In November 2017 Prof. Uygun joined the Log*Dynamics* Research Cluster as a member.

His research focuses on data-driven optimization of manufacturing processes by analyzing and predicting customer requirements changes and their effects on logistical parameters, reducing lateness in continuous casting processes, developing virtual modeling and simulation environments for smart manufacturing systems.

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New Representation of the ISL in Log*Dynamics*

In the course of a restructuring of the Institute of Shipping Economics and Logistics (ISL) and replacing the previous departmental structures, five fields of competence have been established: Maritime Intelligence, Maritime Security, Maritime Environment, Maritime Simulation and Maritime Transport Chains. The management structure has also been adapted – the ISL is now directed by two scientific managers and an administrative manager. The two scientific managers Prof. Dr. Burkhard Lemper and Prof. Dr. Frank Arendt will represent the ISL in the research cluster Log*Dynamics* in the future.

Burkhard Lemper has been an honorary professor at the University of Applied Sciences Bremen since 2007. Since 2016 he holds a cooperation professorship between the ISL and the University of Applied Sciences Bremen.
Prof. Lemper has been a member of the ISL management since 2012. His research and activity focuses include the analysis and forecasting of maritime markets, the modelling of sea and land transport and the evaluation of political or infrastructural measures.

Frank Arendt has been member of the ISL management since 2002. Since 2009 he holds a cooperation professorship between the ISL and the University of Applied Sciences Bremerhaven. His research and activity focuses include the optimization and automation of business processes in maritime logistics as well as security issues for ports and intermodal transports.

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Awards

Best Paper Award at PRO-VE 2017 for the IGS and BIBA

Morice Daudi, Jannicke Baalsrud Hauge and Klaus-Dieter Thoben received the best paper award for their paper on' Influence of Information Sharing Behavior on Trust in Collaborative Logistics'. The paper was presented at the PRO-VE 2017 – 18th IFIP Working Conference on Virtual Enterprises. University of Bremen and BIBA have long been contributing to this research field through several research projects as well as PhD thesis. Morice Daudi, the PhD candidate at the International Graduate School for Dynamics in Logistics (IGS) presented key parts of his PhD research on trust in collaborative logistics, whose main goal is to encourage and support sharing resources in logistics.

The main contribution in the article is an establishment about how information sharing behaviors of collaborating partners influence trust and trusting outcomes. To achieve this, at first hand, the article establishes a framework that integrates core concepts such as information behavior, information-seeking behavior, partner behavior, collaboration on shared resources in logistics, and trust. This framework guides a trust model, which in turn, accepts a hybrid of certain and uncertain information to manipulate logistics performance metrics, and subsequently evaluate trust. Afterwards, the data, conceptual, and ope-

rational validities are ensured prior to carrying out simulation experiments in multi-agent systems. The PRO-VE conferences address topics related to collaborative networks and collaborative organization forms like Virtual Organizations, Virtual Enterprises and other forms of Enterprise Networks, Professional Virtual Communities, or industry clusters and business ecosystems are now supported by large research and business practice communities. The authors are pleased about the award and stress the importance of training in the IGS, which has contributed to the outstanding quality of the paper.

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BIBA Welcomes Brazilian Visiting Scientists as Part of the Brazilian-German Cooperation Project AdaptiveSBO

Within the BRAGECRIM program (Brazilian-German Collaborative Research Initiative on Manufacturing Technology), the German Research Foundation (DFG) and the Brazilian Funding Agency CAPES are promoting cooperation projects between German and Brazilian institutes in the field of production technology. The project AdaptiveSBO (An adaptive simulation-based optimization approach for the scheduling and control of dynamic manufacturing systems) is headed on the German side by Prof. Dr.-Ing. Michael Freitag and on the Brazilian side by Prof. Dr.-Ing. Enzo Morosini Frazzon. A data-driven adaptive simulation-based optimization procedure for the planning and control of dynamic production systems is being developed.

After visits by Prof. Dr.-Ing. Enzo Morosini Frazzon, Prof. Dr. Guilherme Vieira and B. Sc. Diego Evandro Mazzuco, there are currently four Brazilian visiting scientists at the BIBA: Prof. Dr. Mauricio Uriona Maldonado, M. Sc. Ricardo Pimentel, M. Sc. Matheus Pires and B. Sc. Matheus Leusin. During his two-week stay at BIBA, Prof. Uriona and his master student Matheus Leusin are working on the realization of a data exchange framework for the automated exchange of data between a real production system and a simulation-based optimization process. He also holds two research seminars on „Bibliometrics for Literature Research“ and „Business Dynamics“. Ricardo Pimentel, Matheus Pires and Matheus Leusin work together with BIBA employee Mirko Kück on their various work packages during their stay with the cooperation project AdaptiveSBO.

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Internationalisation

Log*Dynamics* Cooperates with the Capital University of Science &Technology (CUST), Pakistan

The Capital University of Science &Technology (CUST) organized their 6th International Business Research Conference in collaboration with University of Bremen. The conference was held on 19th and 20th October 2017. Along with the technical sessions, graced by

scholars and researchers from across the country as well as from the international universities, the university also held a PhD consortium, consisting of talks and lectures from the top-notch scholars of the country. The objective of the consortium was to provide the platform to the PhD students for enhancing their work and collaborating with other researchers, to boost the research output consequently. Log*Dynamics* was represented by Prof. Till Becker, who conducted research at the CUST within the framework of a scientific exchange.

The cooperation results from the EU-funded Erasmus Mundus projects of the International Graduate School for Dynamics in Logistics (IGS). There is now a lively exchange, especially at the professorial level. Next year, further visits by lecturers from CUST to Bremen are planned.

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Logistics Park (LP) in Vietnam - Modern Logistics Solutions

The Institute of Shipping Economics and Logistics (ISL) and the renowned company INROS LACKNER (Germany, Vietnam) have created, for a limited international competition, a concept for a master plan for the development of the “Cai Mep Ha Logistics Park” in southwest Vietnam. The Logistics Park (LP) will have an area of more than 1.100 hectares and is to be built between the sea port of Cai Mep and Phuonc Hoa City. The involved international investors and the responsible decision makers of the logistics sector wish to develop a modern, sustainable multi-modal logistics centre (LP). In order to achieve this objective, the concept of zoning with “superblocks” warehouses was chosen (by IL/ISL), given users of the LP various usage options. The master plan was deemed by the client and its jury to the best and most innovative concept of all the entries to this urban planning and spatial development design and benchmarking competition.

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Research Stay of Darja Wagner at the West Virginia University (USA)

Following the invitation of Prof. Dr.-Ing. T. Wuest, Darja Wagner spend a three-month research stay at the Department of Industrial and Management Systems Engineering at the West Virginia University (USA). The stay was made possible by a research grant from the project BremenIDEA as part of the program IPID4all. During this time, Ms. Wagner worked primarily on her doctoral thesis on the topic of „Decentralized Production Control Considering the Topological Properties of Production Systems“. A further aim of the research stay was to maintain and further develop the research collaborations. In future, joint publications and the development of research projects are planned.

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AGKN on Tour – The 4th Travelling Conference to Asia

Green Freight & Climate-friendly Management: Experiences from German, Malaysia, Thailand and Vietnam was the topic of the 4th Travelling Conference to Asia in October 2017. The host institutions of the travelling conference are famous universities, opening their doors for all interested parties. The three stops over were: Mae Fah Luang University (MFU), Thailand, Universiti Teknologi Mara, Malaysia, University of Transport and Communications, Vietnam. MFU is interlinked with Log*Dynamics*-IGS by the Erasmus Mundus project gLINK.

The content of the first and third stop overs in Thailand and Hanoi were thematically connected with the regional green freight project “Green Freight Mekong” of German International Cooperation (GIZ). The second stop over in Malaysia fed the 12th Malaysian Universities Transport Research Forum Conference (MUTRFC 2017) on “Smart Lifestyle through Innovative Transportation Mobility”. The format of each stop over encompassed networking (among others speed dating with young researchers), exchange of knowledge (workshops and study trips) and elaboration of new project ideas (among others through the “Collaboration wanted pin-board”).

Institutions “on tour” were this time four AGKN-members and one new-comer in the AGKN network: Merseburg University of Applied Sciences (Prof. Dr. Dirk Sackmann), Hamburg University of Technology (Prof. Dr. Carlos Jahn), University of Bremen (Prof. Dr. Hans-Dietrich Haasis), Technische Hochschule Ingolstadt (Prof. Dr. Andreas Jattke), and Hochschule Fresenius University of Applied Sciences (Prof. Dr. Martin Kreeb).

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Details: agkn.de/news/the-4th-travelling-conference-to-asia

Events

6th International Conference on Dynamics in Logistics (LDIC 2018)

Date: **20th - 22nd of February 2018**
Venue: Bremen

The sixth event of the Log*Dynamics* conference series will be held at the University of Bremen from 20th to 22nd of February 2018. The conference addresses scientists in logistics, operations research, production engineering, and computer science and aims at bringing together researchers and practitioners interested in dynamics in logistics. The LDIC provides a platform for discussion of advances in the areas of dynamical aspects of logistic processes and networks. The spectrum of topics reaches from modeling, planning and control of processes over supply chain management and maritime logistics to innovative technologies and robotic applications for cyber-physical production and logistic systems.

The registration for the conference is now open: www.conftool.net/ldic2018

Contact: Prof. Dr.-Ing. Michael Freitag, Prof. Dr. Herbert Kotzab, Prof. Dr. Jürgen Pannek info@ldic-conference.org

Details: www.ldic-conference.org
Photo: ake1150/Fotolia

4th International Conference on System-Integrated Intelligence (SysInt 2018) – Call for Papers

Date: **19th - 20th June 2018**
Venue: Hannover

The International Conference on System-Integrated Intelligence, which is co-organized by Log*Dynamics* for the fourth time already, provides a forum for academia and industry to disseminate their latest innovations and practices. The focus is set on integration of new, intelligent functionalities into materials, components, systems and products to enable future technologies with enhanced capabilities. The participants have the opportunity to benefit from impulses on various topics concerning the future of machines, products and manufacturing as well as get an insight into cutting-edge machine tool technology through an experimental shop floor tour. Complemented by a dinner, the conference will provide abundant opportunities for vibrant discussions and networking.

The call for papers is now published. The deadline for submitting of full-papers is **2nd March 2018**.

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Details: www.sysint-conference.org
Call for Papers: www.sysint-conference.org/callforpapers.html
Photo: sliwonik

Students from Jacobs University and the University of Bremen Are Logistics Ambassadors

Almost sixty proud logistics ambassadors are now counting the state of Bremen and expect a lasting advertising effect for the logistics location on the Weser. The last-named thirteen VIA BREMEN Logistics Ambassadors received their certificates during an event of 15 November 2017 from the major Dr. Ing. Carsten Sieling. Previously, the logistics students from Jacobs University Bremen and the University of Bremen, who come from twelve nations, had been given the logistics competence of the state of Bremen on excursions.

The program made it possible for future logistics managers from Ghana, Mozambique, Tanzania, Zimbabwe, India, Iran, China, South Korea, Syria, Brazil, Mexico and Germany to get to know Bremen‘s logistics world in all its facets, especially during company visits. This included the classic Bremen city tour as well as the Bremen industrial port or a visit to Bremen City Airport. And of course, the logistical delicacies of the state of Bremen could not be missing: the freight traffic center, which still ranks second in European comparison, the Mercedes-Benz plant, the world‘s lead plant for the C-Class, to the car and container terminal in Bremerhaven, one of the most important automobile hubs in the world.

„Logistics is a global field that plays an important role in our curriculum, so we are delighted that thanks to our cooperation with VIA BREMEN, our students have the opportunity to gain an in-depth insight into logistics companies and the knowledge gained as logistics ambassadors to their home countries“ says Prof. Dr. med. Arvid Kappas, Dean of Jacobs University Bremen. Prof. Dr. Hans-Dietrich Haasis from the University of Bremen also emphasizes the win-win situation: „Our Logistics Ambassadors are not only international advertising media for excellent logistics in the state of Bremen, they are also competent and motivated partners for the local economy when it comes to their questions In addition, the program ideally complements our interdisciplinary education in the research cluster Log*Dynamics* at the University of Bremen.“

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Details: www.via-bremen.com/logistics-ambassadors
Photo: Jacobs University

Experience Digitization in Production and Logistics First Hand - Implementation in Practice Follows

Whether a factory in which intelligent components independently control the production process or a flexible, omni-directional conveying system - the visitors to the event at The BIBA - Bremer Institut für Produktion und Logistik were able to admire this and much more. Digitization is a cutting-edge topic, both in research and in practice. At this interface, the event started. The technologies necessary for digital change are usually researched and ready to be implemented. Thus the interest of the economy was correspondingly great. About 95 trade visitors have been informed about the innovative solutions for digital production and logistics and have made a consistently positive assessment. The guests praised the interesting program, the good framework for further discussions and networking as well as the unique opportunity to experience innovations in their research environment at first hand. Now some discussions are bilaterally pursued and deepened. They have the potential to contribute to the implementation of the digitization approaches in companies in Bremen and the surrounding area.

The event was organized by the Chamber of Commerce (IHK) for Bremen and Bremerhaven as part of its series „Industry meets Science“ in cooperation with the BIBA and the Research Cluster Log*Dynamics* of the University of Bremen.

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Stable Growth of the IGS Obvious at the Research Colloquium

The annual Interdisciplinary Research Colloquium (IRC) of the International Graduate School for Dynamics in Logistics (IGS) took place on the 26th of October. The IRC is devoted to the interdisciplinary knowledge transfer. It is always employing different formats. This year it focused primarily the introduction of research areas of Log*Dynamics* to the new incoming researchers. Some new professors introduced their

research fields, doctoral candidates gave examples of their research topics, and the offers of the doctoral training's supporting measures of the IGS have been highlighted. Since the last IRC 8 new international doctoral candidates started their research projects at the IGS. 7 guest researchers, all of them on different levels of education, some funded by the Erasmus Mundus projects FUSION and gLINK, joined the event as well. Finally, all doctoral candidates of the IGS participated. Thus, the stable growth of the IGS community was quiet obvious. For the next year, it is intended to organize the IRC as a scientific Speed Dating event.

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Exchange of Ideas on „Energy Efficiency through Artificial Intelligence“

There is still great potential for saving energy in production. Artificial Intelligence (AI) offers many options for developing it. This is exactly what has been the focus of the research project „AI supported platform for assisting production control to improve energy efficiency“ (KIPro) at the Institute for Integrated Product Development (BIK) at the University of Bremen, which started in September 2015. The BIBA - Bremer Institut für Produktion und Logistik is also involved in this project. It is one of the projects bundled in the thematic network „Energy Efficiency through AI Technologies“, funded by the Federal Ministry for Economic Affairs and Energy (BMWi).

Now scientists from this network as well as experts from industry and politics have met at the workshop „Digitalization in Production to Increase Energy Efficiency - Application of AI“ at the University of Bremen. At the BIK's invitation, they met in the BIBA labs in October to present their research and to discuss current developments and needs in this field. The event took place in cooperation with BMWi and Projektträger Jülich (PTJ) and, accordingly, was attended by high-caliber experts.

The workshop focused on technical challenges such as data handling, algorithms and evaluation, as well as business questions such as how well companies are prepared to use AI, what is needed to implement AI in production, and which products and production processes offer the greatest potential for the use of AI. In addition, the broader outlook of the field was discussed: which trends and topics will become part of the Federal Government's next energy research programs.

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Photo: BIK

PortSec Presented at Annual Conference ITS/KRITIS 2017

On 11th and 12th October, 2017 the congress of the German Federal Ministry for Education and Research (BMBF)'s funding programme, IT Security for Critical Infrastructures' (ITS|KRITIS) was held in Berlin, Germany. On this occasion, the PortSec project as well as first research results were presented. The following topics concerning IT

security for critical infrastructures were discussed:

• Cyber attacks
• Certification and standards
• Secure identities
• Management of information security
• Security of platforms, firmware and operating systems
• Industrielle Sicherheit/Internet der Dinge
• IT-security, ethics and legislation

The consortium consisting of the Institute of Shipping Economics and Logistics (ISL), Technologie-Zentrum Informatik (TZI) of the Bremen University, dbh Logistics IT AG and datenschutz cert GmbH presented its contribution within the PortSec Project. The structure of the port-IT-infrastructure in general was outlined as well as the interaction of individual parties involved in the port processes. A given example demonstrated that stolen or manipulated data can cause considerable damage. The presentation focused on the attack scenarios „Sabotage by spoofing“ and „Spying of confidential data for criminal actions“. The congress with its presentations, networks, workshops and panel discussions about IT security for critical infrastructures was very successful from the PortSec perspective and generated interesting impulses for future project work.

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Workshop: Models and Algorithms for Planning and Scheduling Problems (MAPSP 2017)

The 13th Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP 2017) was held this year in Seeon Abbey in Seeon-Seebruck, Germany. MAPSP is a biennial workshop dedicated to all theoretical and practical aspects of scheduling, planning, and timetabling.

This year‘s MAPSP was jointly organized by Susanne Albers (TU Munich), Nicole Megow (U Bremen), and Andreas S. Schulz (TU Munich). Between June 12 and June 16, 2017, 125 participants contributed to a successful event. The international Program Committee had selected 85 submissions, which were presented in three parallel tracks. Five keynote lectures were given by Nikhil Bansal (TU Eindhoven), Bernhard Häupler (Carnegie Mellon University), Monika Henzinger (U Vienna), Jochen Könemann (U Waterloo) and Rolf H. Möhring (BJC-SEC Beijing/TU Berlin). The topics were broadly diversified and included several intriguing problems in algorithmics, complexity, combinatorial and discrete optimization, distributed algorihtms, game theory and operations research.

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Photo: Tanja Ghirardini Photography

34th International Supply Chain Conference: Think Different - Act Digital

The International Supply Chain Conference is one of Europe‘s leading events for logistics and supply chain management. Since it was first staged in 1983, it has developed into a wide-ranging forum attracting more than 3,000 participants from all areas of logistics. It is the place where leading thinkers and movers in the logistics sector share knowledge and recommendations for action, and a forum for the discussion of current issues and future themes in the field of supply chain management.

This year again Log*Dynamics* was part of this important forum: The research cluster participated in the accompanying exhibition and presented methods and technologies for the realization of industry 4.0 applications as well as digital services and new business models in logistics. Those aspects of innovative logistics have met with great interest.

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ISL at MoreSpace Symposium in Bremen

On 23rd October, 2017 the second Weser-Kurier symposium “MoreSpace” took place in Bremen, Germany. About 200 experts from economy, politics and science discussed the space sector’s future, highlighting Bremen’s role as Germany’s number one location related to space industry.

ISL Managing Director Prof. Dr. Frank Arendt participated in the panel „From A to B – Space and Logistics“ and discussed with Jürgen Ackermann (ArianeGroup), Götz Anspach von Broecker (Airbus) and Heike C. Wörner (Schenker AG) about the relation between state-of-the-art logistics and space.
Prof. Arendt emphasized the enormous potential of space based services for transport and logistics and the critical topic of cyber security.

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Workshop „From Product to Product Service - Potentials and Challenges“

Leaders of regional companies met on the 26th September 2017 at the Aerospace Center in Wildau near Berlin with representatives of the European research project „PSYMBIOSYS“ (Product-Service SYMBIOtic SYStems) to discuss new approaches, methods and tools for the integrated development of products and services. In so-called Product Service Systems (PSS), physical products and services are combined in order to offer customers tangible added value. The workshop took place under the heading

„From product to product service - potentials and challenges“. The BIBA - Bremen Institute for Production and Logistics GmbH was also present as PSYM-BIOSYS project partner and presented an overview of the methods and tools developed in the project for the realization of PSS. It was explained in detail how business models can be designed for PSS and how their interactions with business models of the existing portfolio can be analyzed. The discussion in the workshop showed that especially small and medium-sized companies often do not have the opportunity to gain a complete picture of the options and the associated potentials and risks. Therefore, the presented results were received with interest. For instance, it became transparent which different possible combinations of product and service exist and which corresponding revenue models are suitable for certain combinations. The options selected for PSS result in different synergies and conflicts with regard to existing business models. In addition, requirements upon the collaboration performance of partners that should be integrated into the PSS can be derived. As an additional project partner, FTI uses the method offered with the corresponding analysis tool already during the development of its PSS business model, as well as for its review and update.

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Photo: FTI Engineering Network GmbH

Expert Workshop on Utilization of Earth Observation for the Maritime Industry

Satellite Services for the maritime industry was the subject of the MarSat project's recent workshop, which drew together more than 50 potential users from shipping companies, commercial operators, system service providers, safety officers and consulting services. The aim was to cross-fertilize ideas on how marine and maritime companies can benefit from satellite services and how they can integrate them in their daily routine.

Maritime services based on the integrated utilization of space-based systems are of interest to a wide range of user communities: fisheries, coast guards, port authorities, shipping companies, commercial operators, national and international research institutions, and many more. Data from Earth Observation (EO) satellites offer a unique view of our oceans, seas, and coasts. Satellites, and their on-board sensors, on the one hand side provide routine, cost effective, wide area surveillance covering all maritime zones, and, on the other hand side, can precisely be pointed to targeted locations for monitoring specific operations or to gather information in response to intelligence requirements.

MarSat, funded by the BMWi, the German Federal Ministry for Economic Affairs and Energy, is a network of five private companies and the Institute of Shipping Economics and Logistics (ISL) and develops new innovative services for the marine and maritime community using satellite EO data.

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