LogDynamics Newsletter August 2019

Projects

Dynamic Production Network Broker

Fully dynamic cross-company production networks that adapt to individual customer orders are a core vision in the Industry 4.0 sector. Production capacities are sometimes required at very short notice, e.g. in the area of drawing and special parts. Reasons are the failure of company owned machines or machines of a supplier, the complete failure of a supplier or also a sudden increase on the demand side. In these cases, however, there are barriers to a rapid response, such as finding one or more suppliers with free capacities or the high manual effort required to integrate new suppliers into existing ordering and logistics processes.

The newly started project „Dynamic Production Network Broker", in which BIBA - Bremer Institut für Produktion und Logistik GmbH participates, is intended to support the dynamic formation of production networks by means of a modular service system. This includes the matching of supply and demand for short-term availability of production capacities while at the same time ensuring the necessary transport capacities, the short-term onboarding of suppliers, i.e. rapid integration of production, logistics and quality assurance and the possibility of making complex assembly activities compatible for outsourcing. The latter should be achieved by means of an assistance system that is based on Augmented Reality (AR) technologies.

BIBA will contribute to the project by developing an ontological description of machine capabilities and requirements, including a semantic mediator with the necessary interfaces to other information systems. Moreover, we will develop a concept for generic service-based business models and their evaluation on the basis of the project results. Together with the industrial partners, the crucial points for designing a production network broker are worked out and on this basis four use cases are defined. For these four use cases, „Minimal Viable Products", i.e. prototypical solutions that can be implemented quickly, are developed in individual modules and later integrated into a continuous process.

The collaborative project is funded by the Federal Ministry of Education and Research for the duration of three years.

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Photo: Eisenhans / adobe stock.com

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Project LAVIS Started - Improving the Predictability of Seaports

Today, applications for tracking vessel positions are an important tool in the coordination of maritime transport chains in order to estimate the expected arrival of cargo at a port and thus to obtain an improved planning basis. However, even if the vessel arrives on time, various factors, such as the planned unloading sequence or the capacity utilisation of the terminal, prevent a reliable statement to when cargo will be available for further transport. In practice, the variances in release times can amount to several days, especially against the backdrop of increasing ship sizes. As a result, this „blind spot" can have a considerable impact on the efficiency of the maritime transport chain.

This is where the project „LAVIS - Intelligent Data Analysis for Predicting Cargo Availability within Seaports", funded by the BMVI (German Federal Ministry of Transport and Digital Infrastructure) within the mFund programme, comes in: The main objective is to evaluate the feasibility of approaches for determining the expected cargo availability. The analysis of factors, processes and data sources to be taken into account will thus create the basis for future forecasting services. The project has a duration of one year and will be jointly carried out by ISL and akquinet port consulting GmbH.

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Photo: pixabay

Survey on the Cooperation between Humans and Robots in a Common Workspace Without Cages

IRobots without cages that work hand in hand with humans, support and relieve them - they are finding their way into more and more areas. Even in small and medium-sized companies? Which needs, ideas and opportunities are there, and what do the people in these companies want? At BIBA - Bremer Institut für Produktion und Logistik GmbH, the research project „Auton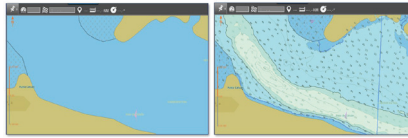omous assistance system to support HRC assembly processes" (AutARK), funded by the Federal Ministry of Economics and Technology, are currently working on the use of humans and robots in the shared workspace of SMEs. For this purpose, a survey shall provide further information.

The survey is primarily aimed at employees in SMEs where robots could be integrated. Nonetheless, answers from larger companies are also welcome. Participation takes about 10 to 15 minutes. As an example, participants are asked to imagine a possible workplace with collaborating robots in their company and to answer questions regarding this potential workplace. If you are interested in the results of the study, at the end of the survey you have the opportunity to register in order to get those send to you. This does not allow any conclusions to be drawn about the survey responses. The survey is anonymous.

Survey: www.survey.ips.biba.uni-bremen.de
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Photo: Tine Casper (Mittelstand 4.0-Kompetenzzentrum Bremen)

Increasing Safety and Efficiency in Maritime Operations using Satellite Information

Increasing safety and efficiency and reducing the risk of maritime operations is one of MARSAT's core ambitions. MARSAT ist a shortly completed project in which the Institute of Shipping Economics and Logistics (ISL) participated. To tackle this in an agile and innovative way, MARSAT has formed a German Consortium of excellence in satellite analytics, on-board software and hardware development with deep understanding of the maritime market. In recent years, MARSAT has developed and evaluated solutions to aid planning and routing in higher latitudes and polar waters, to increase safety of navigation in areas which were inadequately surveyed, and developed respective information portals.

In July 2019 the R&D stage of MARSAT was officially completed. This does not mean that MARSAT has come to an end, but rather that we are proud to have reached the next, mature level, continuing to bring innovations to the market. "The demand from the maritime industry for near-real-time satellite information is obvious and much of the potential is yet to be explored," said Dr Nils Meyer-Larsen, MARSAT Project Manager at the ISL.

The ISL team has analysed the market demand and potential of satellite analytics in more detail. "We believe that the key to the success of MARSAT is the ability to respond to the market and adapt to new satellite capabilities in an agile and interdisciplinary fashion. That's one of the strengths of the MARSAT Consortium." The MARSAT team includes the satellite data service providers EOMAP and Drift&Noise Polar Services, maritime hardware and software providers SevenCs and TRENZ, and ISL. MARSAT is co-financed by DLR Space Administration (part of the German Aerospace Center), with funds from the German Federal Ministry for Economic Affairs and Energy (BMWi).

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Complementary Application of Mathematical and Discrete-Event Models to Solve Complex Planning and Control Problems in Offshore Construction Logistics

Offshore construction logistics pose an exceptionally challenging problem in terms of planning and control. Generally, one can differentiate two approaches: event-discrete simulations as well as mathematical or stochastic optimizations. By themselves, both methods provide their own advantages and disadvantages in terms of computational time, level of detail und optimality.

The shortly started project „OffshorePlan" of the BIBA - Bremer Institut für Produktion und Logistik GmbH aims to investigate new ways for the complementary utilization of both types of methods in the context of offshore construction logistics. Under the basic assumption that despite formal differences, both types of models describe the same elements of the real world system, this project aims to develop a method to convert in between or to generate each kind of model with its own level of aggregation/abstraction based on a more basic description of the real world system. Consequently, the advantage of both types of models can be used complementary within computer aided planning and control methods. The project is funded by the German Research

Foundation and has a duration of 2,5 years.

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Photo: Hochtief

ROBDEKON: Central Contact Point for the Development of Robots for Decontamination Tasks has Opened

When chemically contaminated sites or old landfills are rehabilitated, toxic waste sorted or nuclear facilities dismantled, people work in hazardous environments: they handle pollutants, there is a risk of fire or explosion or the radioactive radiation is increased. Therefore, complex and often stressful protective measures are necessary. This could be remedied by robots and autonomous machines that carry out the activities in the vicinity even without an operator. On June 25th, 2019, the „ROBDEKON - Robots for Decontamination in Harmful Environments" competence centre, funded by the Federal Ministry of Education and Research (BMBF), was opened in Karlsruhe. The Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI) in Bremen is one of the four participating research institutions.

„ROBDEKON unites the key experts in decontamination robotics and creates the basis for sustainable cooperation for the transfer of innovations in practice," said Dr. Andrea Detmer, Head of the Civil Safety Research Department at the BMBF, during the ceremony, which also saw the inauguration of a new laboratory hall for ROBDEKON. „In this way, the competence centre will become the crystallization seed for developments which, with the help of artificial intelligence, generate very concrete added value for people who are potentially exposed to health hazards on a daily basis, e.g. during the remediation of landfills and contaminated sites. The aim is to relieve them of burdensome work and thus minimise risks to life and limb".
ROBDEKON is the central contact point for all questions regarding robotics for decontamination tasks and is open to anyone who would like to contribute or work on their projects with the support of the centre's experts. ROBDEKON offers consulting services, is happy to cooperate with other research institutions and wishes an intensive dialogue with the relevant industry in order to develop targeted and practical solutions.

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Photo: Fraunhofer IOSB, Kopfsalat Medien

Augmented Reality and 3D Printing for Surgery

A consortium led by the University of Bremen combines virtual reality, augmented reality and 3D printing to improve the planning and execution of operations. The technologies can also be used for the training and further education of physicians. In addition, printed 3D models make it possible to communicate more clearly with patients.
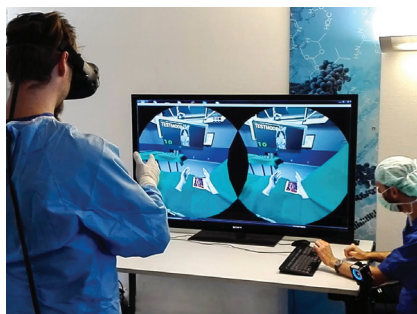
New technologies can help to provide

surgeons in surgical theaters with important information and thus significantly increase the chances of success. A research group led by the Center for Computing Technologies (TZI) at the University of Bremen is currently developing test processes and applications. The use of virtual reality (VR), thus artificial realities created with the help of computers, augmented realities (AR), i.e. computer-supported expanded reality, and 3D printing are to improve the planning and realization of surgeries. The results are to be additionally employed for training purposes and for patient information. The Federal Ministry of Education and Research is funding the "Vielseitiger Immersiver Virtueller und Augmentierter Tangible OP" (Multifaceted, Immersive, Virtual and Augmented, Tangible Surgery) (VIVATOP) with a total of 2.2 million euros over a period of three years.

The planning of an operation with 3D models has significant advantages over the current method with 2D pictures. Doctors have a notably more realistic and comprehensible overview of the area on which they wish to operate. Alongside the 3D computer models, the VIVATOP researchers are testing the use of lifelike physical models of the affected organs. The picture data is analyzed and prepared for this so that it can be imported to a 3D printer, in order for a lifelike organ, for example a patient's liver, to be made.

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Foto: cirp

RFID Transponders to Monitor Curing During the Manufacturing Process and for Product Life Cycle Management of Fibre Composite Components

In order for fibre-reinforced plastics to retain their advantageous material properties, it is important to harden components made of these materials in a targeted manner. The use of Radio Frequency Identification (RFID) technology for curing monitoring represents a completely new approach in this field. In this completed project with the participation of BIBA - Bremer Institut für Produktion und Logistik GmbH, a Curing Transponder was developed which uses RFID technology to monitor the curing process. The Received Signal Strength Indicator (RSSI) of curing transponders integrated in fibre-reinforced plastic components is evaluated in software also developed in the project in order to visualise the curing progress. This forms the informative basis for optimizing the curing process. The advantages of RFID technology compared to conventional methods for curing monitoring lie in the wireless reading of the RFID transponders and in the additional benefit that an RFID transponder integrated in the component generates in the further life of the product.
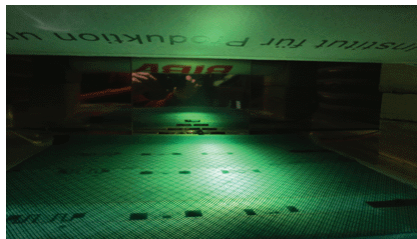
In the project titled „Curing-Transponder", BIBA - Bremer Institut für Produktion und Logistik GmbH was responsible for data analysis and the development of algorithms necessary for interpreting the RFID signals in order to monitor the curing process on the basis of the RSSI curve. The project was carried out together with the Faserinstitut (Bremen) and the RFID company tagItron (Salzkotten) as well as the plastics processing company Haindl (Bremen). The device developed in the project and the developed process were applied for a patent by the project partners.

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The Inland Waterway Transport Project EMMA Approved for Extension

The project partners were pleased to receive the approval for the EMMA Extension application by the Interreg Baltic Sea Region Programme. Same as in the EMMA project, the ISL - Institute of Shipping Economics and Logistics - is again involved in the extension. EMMA Extension builds on the EMMA projects' analyses, results and recommendations. Enhancing inland waterway transport (IWT) still is focused on and reflected in all activities of the extension project. EMMA Extension is the logical next step in further developing IWT services in Sweden, Poland and Lithuania. In addtion, the support for the uptake of newly developed river information services (RIS) in Germany will continue, with the ISL playing a key role. Thus, the project will increase the quality and sustainability of results. In addition to ISL, six other partners are engaged in the project, which is led by Port of Hamburg Marketing Reg. Assoc. (HHM).

"The strong interest to further implement IWT solutions was expressed by the entire original EMMA partnership. Unfortunately, the extension call just allowed a limited partnership, so that we had to choose from all the very good suggestions received. Anyhow, all EMMA partners are still involved in a variety of ways to save the network created and to plan and apply for future tangible projects", said Stefan Breitenbach, Head of the Project Division at Port of Hamburg Marketing.

One million Euro is being made available for the partnership to implement IWT services and RIS solutions. The project started on August 1st (18 months lifetime) and the kick-off meeting in Stockholm is under preparation.

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Photo: pixabay

Farewell from Bremen: DFKI Robot AILA Goes to Berlin as Robotics Ambassador

Next destination: the German capital - AILA, the humanoid robot of the German Research Center for Artificial Intelligence (DFKI), travelled to Berlin this summer as Bremen's ambassador for robotics. Starting in September 2019, she will provide visitors of the new Future Museum „Futurium" with insights into the fascinating world of robotics for the coming years. Until June 15th, Bremen citizens were able to visit AILA as part of the exhibition „EINFACH WISSENSWERT: Robotik und KI" at the Haus der Wissenschaft.
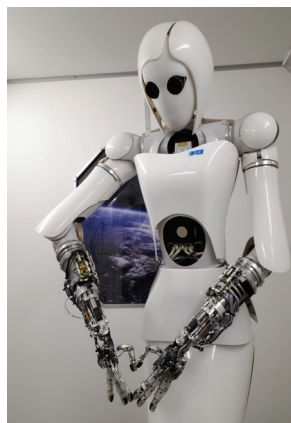
AILA, who celebrates her 10th „birthday" next year, was developed at the Robotics Innovation Center of the DFKI for research in the field of mobile manipulation. Equipped with powerful sensors and actuators, she is able to comprehensively perceive her environment, move within it and manipulate objects. Her physique and mobility enable AILA to operate in almost any human environment. Over the years, the human-like robot has been used as a research platform in various projects, e.g. for cooperation with humans in the application field of space or in industry 4.0. The researchers have succeeded in gaining important insights - among others in the fields of whole-body control and motion planning for complex

robot systems, two-arm manipulation and mobile manipulation, gripping with multiple-finger robot hands, teleoperation as well as reusable robot capabilities - which they have published in internationally recognised specialist journals. In addition, AILA achieved local and national recognition through trade fair appearances, exhibition presentations and a large number of media reports.

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Photo: DFKI GmbH, Dennis Mronga

Safety Process System for Cryogenic Fluid Transfer

The handling of cryogenic fluids (e.g. liquefied natural gas) bears major risks with regard to operational safety. If the liquid leaks during a transfer process (e.g. fueling of ships), large amounts of gas can quickly be produced which are highly flammable and explosive. Therefore, an appropriate safety system for process monitoring is necessary.

The aim of the ZIM-project funded by the Fedral Ministry of Econimics Affairs and Energy is to improve operational
safety during the LNG transfer process by means of a redundant optical monitoring system. This system should be able to both detect fittings, ship superstructures, and people automatically and to perform an automated visual inspection of the correct coupling.

The multi-camera system consists of a wide-angle, a zoom and an infrared camera and can therefore react to a wide variety of environmental conditions (day, night, weather influences). It automatically monitors the LNG transfer process. By using Deep Machine Learning, the object recognition of fittings, ship superstructures and people is made possible, which is necessary for monitoring the danger zone. BIBA - Bremer Institut für Produktion und Logistik GmbH is a research partner in the project.

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Photo: Carabay / adobe stock.com

Development of a Sensitive Valve Set for High-Volume Ship to Ship LNG Transfer

The project aims at the development of a system which can be used on a large number of different ship types and thus leads to a significantly higher level of safety, installability and maintainability while at the same time reducing costs. The task of BIBA - Bremer Institut für Produktion und Logistik GmbH is to develop an Augmented Reality (AR) solution that can be used for maintenance and service purposes alongside the valve set.

By means of a combination of a commercial data goggle, a camera and an

embedded PC, an easily configurable application solution is created. This solution should be able to identify the existing components, to read out the corresponding status information both visually and via radio, and to supply the users with maintenance information and checklists. The AR solution will be developed to support technicians in operation, installation and maintenance of the sensitive LNG valve set. By means of image processing and object recognition techniques, the first step is to collect information on the condition of the valves. Subsequently, an AR-User Interface will be developed, which acts as an assistance system for the users.

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Photo: Michael Jung / Fotolia.com

Intelligent Textile Surfaces for the Smart Home

The basic principle of intelligent living environments is to install technical systems wherever they are needed. However, the necessary power and communication connections are not always available. In the new ConText project, a consortium coordinated by the German Research Center for Artificial Intelligence (DFKI) is developing a user-friendly and intuitive technology for smart textile surfaces that makes walls and floors in living areas usable for cable-based power supply and communication. The Federal Ministry of Education and Research (BMBF) is funding the project with around 2.9 million euros.

The joint project aims at a flexible, user-oriented and intuitive solution that can be installed easily and without great effort in the living area. To this end, partners from industry and research are developing an IoT infrastructure consisting of smart wallpapers, carpets and textile surfaces, so-called Connecting Textiles. These areas can be used not only to supply IoT devices with low power on a cable basis, but also to communicate with each other via standardized smart home protocols.

The research focus of the DFKI research area Cyber-Physical Systems under the direction of Prof. Dr. Rolf Drechsler lies in the fields of software and hardware design, verification of electronic systems and information security. Accordingly, the DFKI scientists in ConText are responsible for providing a secure communication infrastructure for electronic textiles that enables robust and reliable communication between smart home centers and IoT components. The guarantee of data integrity and state-of-the-art encryption play a major role in this. The developed infrastructure shall be open for different Smart Home protocols and support the simple connection of any IoT device.

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Photo: DFKI GmbH, Grafik: Annemarie Popp

Gamified AI Assistance System for Support of Manual Assembly Processes

For financial reasons, the assembly and inspection of products in small series is often performed manually at manual workstations. Due to small batch sizes and high product variety, full automation is not effective. So far, the support of the employees is mainly limited to the optical highlighting of the required components by means of pick-by-light, the control of the correct assembly by multisensor systems and the projection of further information into the work area. The common characteristic of all current systems is the focus on the product to be manufactured, without separate consideration of the employee.
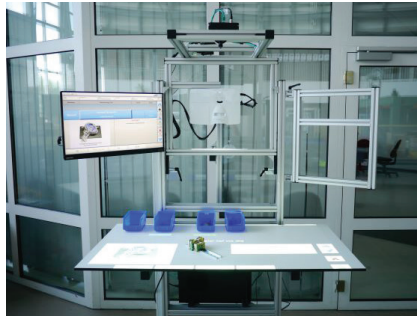
In order to meet this challenge, the BIBA - Bremer Institut für Produktion und Logistik GmbH has initiated a new EFRE-project: Gamified AI Assistance System to Support the Manual Assembly Process (AxIoM). The aim of the project is the development of an assistance system which, in addition to the assembly product, also takes the employee at manual assembly stations into account and improves their work situation. This is to be ensured by a new system based on artificial intelligence. The use of machine learning methods enables the capturing and analysis of both the employee's ergonomic and the production-related situation, allowing the newly developed assistance system to adapt to the individual needs of the employee. This encompasses recognising and reacting to the employee's posture, specific strengths and weaknesses, changes in performance as well as the current process progress and the quality of the assembled component.

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Awards ⏏

Artificial Intelligence: Two Log*Dynamics* Members Honored

The University of Bremen plays an important role in the development of Artificial Intelligence (AI) in Germany. According to a jury of experts, three of its professors are either among the ten most influential minds or are responsible for some of the most important technologies in German AI history. The university professors Otthein Herzog, Frank Kirchner and Christian Freksa and their fields of work are named in the two lists compiled by the expert jury of the Gesellschaft für Informatik e. V. (Society for Computer Science) with a view to the development of artificial intelligence in Germany.

The topic selected by the BMBF for 2019, Artificial Intelligence, is currently perhaps the most intensively discussed area of science. The adoption of human abilities by machines is to become the basis of a new economic revolution. But who were and are the driving minds and technologies behind the development of AI in Germany?

Professor Otthein Herzog is one of them. He has been active in research and

teaching in the field of artificial intelligence for more than 38 years, many of them for the University of Bremen. There he established the Technology Center for Computer Science and Information Technology (TZI) and developed numerous successful applications in AI with his working group, for example for semantic image analysis, expert systems, machine learning, planning and configuration as well as multi-agent systems. By being elected among the ten most influential minds in the history of AI in Germany, the expert committee honoured its outstanding position in this scientific field.

However, not only heads, but also „ten important technologies" of German AI history were selected. These include the area of „Autonomous Systems / Autonomous Driving". Here, university professor Frank Kirchner - today also spokesman of the German Research Center for Artificial Intelligence (DFKI) and head of the Robotics Innovation Center of this research institute - together with his teams did groundbreaking work.

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Photo: phonlamaiphoto / adobe stock.com

New Ways to Safe Human-Robot Interaction - Project KAMeri Honoured as „Awarded Landmark in the Land of Ideas"

The joint project „KAMeri" is the winner of the competition „Excellent Landmarks in the Land of Ideas" 2019 and was honoured at the award ceremony on May 14th, 2019 in Berlin. In KAMeri, eemagine Medical Imaging Solutions GmbH, the Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI) GmbH, the August-Wilhelm Scheer Institute for Digital Products and Processes (AWSi) gGmbH, and NEXT robotics GmbH & Co. KG developed a novel brain-computer interface for human-robot interaction. This captures the human brain waves and thus makes it possible to adapt the interaction to its mental state and thus to the current performance of the human being - for more safety at the workplace.

The future world of work will be characterized in many areas by spatially and functionally increasingly direct interaction between humans and robots. This requires innovative concepts to ensure occupational safety and to avoid accidents caused by human misconduct, e.g. due to stress or fatigue. The aim of the „KAMeri - Cognitive Occupational Safety and Health for Human-Machine Interaction" project is to support employees who already work with robots, for example in assembly. To this end, the partners are developing a new, easy-to-use headset with an integrated brain-computer interface that can permanently record human brain waves using electroencephalography (EEG). The data collected is processed centrally using a cloud-based solution in order to identify critical human states through analysis using machine learning methods. Particular attention is paid to the security of data transmission. In addition, the quality of the data is evaluated with regard to its suitability for drawing durable conclusions. The security-relevant cognitive states detected in this way, e.g. a high stress level or the worker's reduced ability to concentrate, are reported to the interacting systems and used to optimize the interaction in real time with regard to increased security. For example, in case of decreasing attention, the robot involved in the process can independently slow down the speed or make recommendations for break times, e.g. via smartwatches.

Internationalization ▲

Summa Cum Laude in the IGS

After a wave of successfully acquired scholarships a few years ago – and thus the admission of numerous doctoral candidates for the International Graduate School for Dynamics in Logistics (IGS) –, the same flow is now washing an above-average number of successfully graduated engineers and economists back into the world. By end of August, there will be 10 new Ph.D. degree holders of 2019 in total from all four departments of LogDynamics (Physics/Electrical Engineering, Mathematics/Computer Science, Production Engineering, Business Studies/Economics).

One of the lucky ones in the IGS is Kishwer A Khaliq. She came from Islamabad and received an EU-funded scholarship from the Erasmus Mundus project cLINK. She was actually selected for a research stay in Northumbria, UK, but British visa resistances moved her to the University of Bremen at the last second. This was the young scientist's first stay abroad. Before her arrival, she was worried whether Germany was safe enough for a Muslim woman and then there was the completely foreign language (German!). But all doubts dissolved quickly – on both sides: Security was not an issue in Europe, nor was acceptance in the internationally mixed doctoral training group of the IGS, and research can also be conducted in English in Bremen. After two years of external funding, she and her supervisor, Prof. Dr. Jürgen Pannek, agreed: a doctorate in the Faculty of Production Engineering at the University of Bremen is a win-win situation for both sides. LogDynamics therefore granted a significant extension of the scholarship from local funds. Kishwer worked on her topic „Vehicular Ad Hoc Network: Flooding and Routing Protocols for Safety & Management Applications" and published 16 papers. She completed her doctorate in July 2019 – with the highest possible grade – and is now on her way to new scientific and personal shores. Everybody is happy, even Dr. Nauman Aslam, the intended supervisor at the University of Northumbria. He served as external reviewer in the outstanding graduation of Mrs. Dr.-Ing. Kishwer A. Khaliq at the IGS!

Alexander-von-Humboldt Professor Kate Grudpan Visits the IGS

The International Graduate School for Dynamics in Logistics (IGS) and the College of Arts, Media and Technology (CAMT) of Chiang Mai University (CMU) began their collaboration in 2013 with the application for an EU-funded Erasmus Mundus mobility project. This was followed by further applications and a vivid exchange, which culminated in a Memorandum of Understanding (MoU) signed by both universities at the end of last year. Dr. Kate Grudpan, Professor of the Faculty of Science at the CMU, played a key role in this expansion. He was
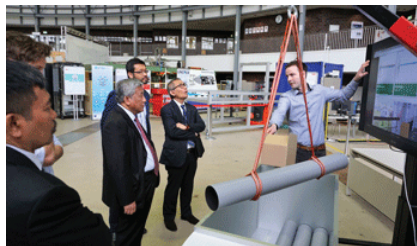
already an Alexander-von-Humboldt- scholarship holder in Germany, at that time at KIT, University of Karlsruhe. In 2019, he was again offered an AvH mobility for a total of three months, which he will use to intensify contacts in Germany.

He became aware of Bremen through the measures of the IGS, which specifically support the personnel development of international doctoral candidates and interdisciplinary cooperation. He would like to integrate the concept of the IGS into the catalogue of measures of the Multi-Mentoring System 5 (MMS5), which he is currently coordinating. MMS5 comprises several universities in northern Thailand and is funded by the Thailand Research Fund. The concept of the IGS needs to be adapted to the Thai culture, tried and tested. First steps for the transfer of the concept have already been realized through the Erasmus Mundus projects the IGS has been partner of. It is a good thing that the University of Bremen has been granted this year with funding for a cooperation with Thailand in the framework of the European Erasmus+ International Credit Mobility. This new project starts in August. The new project starts in August. Prof. Grudpan has already been a guest of IGS several times. This year with the AvH funding in March and August. In November he will return to Bremen. Afterwards, a number of mobilities will go in the other direction. Some of them funded by the local Thai project.

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Prof. Kate Grudpan, Ph.D. kgrudpan@gmail.com
Details: www.logistics-gs.uni-bremen.de/99.html?&L=1

Prominent Visit from Indonesia

The interest in Log*Dynamics*' research activities extends far beyond national borders. On April 29th, 2019, a delegation from Indonesia visited the research cluster and BIBA. The representatives were the President of the Advisory Board of Institut Teknologi Sepuluh Nopember Surabaya (ITS), the Rector of the University Nahdlatul Ulama Surabaya and the Vice Rector of the University Nahdlatul Ulama Surabaya (UNUSA). The guests got to know the research cluster and took part in demonstrations on the key topic of „Digitalization in Production and Logistics". They were interested in the close relationship between research and practice, the transfer to Log*Dynamics* and the structured doctoral training at the International Graduate School for Dynamics in Logistics (IGS). The delegation was accompanied by Dr.-Ing. Hendro Wicaksono, Professor of Industrial Engineering at the Jacobs University Bremen. In addition to approaches for joint activities between Log*Dynamics* and Indonesia, the interest in integrating Prof. Wicaksono's working group into the IGS was also discussed.

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Log*Dynamics* Welcomes New Visiting Researcher

In June 2019 Log*Dynamics* welcomes Abraham A. Nispel Pizarro from the Texas Tech University (TTU), USA. As a doctoral student he is guest of the IGS. Mr. Nispel studied mechanical engineering at the Pontifical University Catholic of Valparaiso (PUCV), Chile from which he graduated with honors after defending his Thesis on a "Preventive Maintenance Plan for a Fishmeal factory". He was awarded with a scholarship from the College of Engineering of TTU to pursue his doctorate in the Department of Mechanical Engineering under the guidance of Prof. Dr. Stephen

Ekwaro-Osire in the Laboratory of Product & Design and Development.

His current research interests include:
● Uncertainty Quantification and Reliability analysis in Engineering Design
● Probabilistic Prognostic and Health Management
● Offshore wind and wave energy devices Design.

His research goals during the two-months stay with Log*Dynamics* are to establish partnerships that allow him and his research team in the U.S. to exchange knowledge and find new research opportunities in the areas of offshore wind energy, prognostic and health management of machinery components. Furthermore, Mr. Nispel aims to develop connections with experts in offshore devices that allow for efficiently model wave loads exerted on the offshore wind turbines foundations.

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Events ▲

Log*Dynamics* at the 36th German Logistics Congress

Date: **October 23rd - 25th, 2019**
Venue: Berlin

The German Logistics Congress is one of Europe's most important events on logistics and supply chain management. Here, the leading thinkers and experts in the logistics sector impart knowledge and recommendations for action as well as discuss current problems and future topics. From the outset, the congress is intended to play an important role as a platform for contacts and business initiations. Log*Dynamics* is once again participating in the accompanying trade exhibition together with the Mittelstand 4.0-Kompetenzzentrum Bremen. Its presence is dominated by digitalization, with the focus on digital communication, digital service, digital transport, digital cargo handling and digital product. We cordially invite all congress participants to visit us at the booth PV/23.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.bvl.de/en/iscc

One Year ‚'The Digital Now" - the Great Convention on Digitalization

Date: **September 26th, 2019**
Venue: Bremen

The event-series „The Digital Now - exciting examples from practice" of bremen digitalmedia and the Mittelstands 4.0-Kompetenzzentrum Bremen, in which BIBA and the ISL is involved, turns one year old - that must be celebrated! At our large Digitalization Convention, you will have the opportunity to meet many of the hosts of the event series over the past months and learn about a wide range of digital applications and solutions. As always, practical relevance is important to us, which is why, in addition to many practical application examples for you to try out at the stands, we will also be holding various workshops for you.

In the evening, our two keynote lectures will give you new food for thought on the opportunities and limits of our digital society. Afterwards, we will round off the event with snacks, drinks and a wonderful view over Bremen.

Contact: Lisa Buschan lb@kompetenzzentrum-bremen.digital
Details and registration: www.dasdigitalejetzt-convention.eventbrite.de

OPEN CAMPUS Was a Great Success

Experiments, talks, fun for children and open-air concerts - on Saturday, June 15th, 2019, the University of Bremen's OPEN CAMPUS was crowded with visitors and in a party mood. About 20,000 guests took the opportunity to inform themselves about scientific topics and offers at the university in a relaxed atmosphere or to become active themselves. In the evening, everyone celebrated in the campus park - the concerts by Namika and Megaloh were a crowd-puller, the interest was great. The numerous guided tours, lectures and workshops for children were almost fully booked until the evening. The two LogDynamics and BIBA tours were also well received. Under the motto „Logistics and Industry 4.0 - Product Meets Process, Digital Meets Real", we were able to get around 35 Open Campus visitors excited about hands-on logistics research.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.uni-bremen.de/en/open-campus

LogDynamics at the transport logistic 2019

LogDynamics is at the forefront of logistics research, both in terms of basic and applied research. An important aspect of applied research is the strengthening of cooperation with the logistics industry, to which international trade fairs are contributing a great deal. This year, the research cluster LogDynamics will once again be exhibiting at the Bremen / Bremerhaven joint booth at transport logistic, one of the largest logistics trade fairs in the world. The focus of the presence will be on the Mittelstand 4.0-Kompetenzzentrum Bremen, which offers support to small and medium-sized enterprises in their digital transformation. We look forward to your visit at the joint booth Bremen / Bremerhaven, No. 213/314, in Hall B4.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.transportlogistic.de/index-2.html

SecProPort Presented at transport logistic 2019

From 4th to 7th of June 2019, the transport logistic, the world's leading trade fair for logistics and transport, took place in Munich. On this occasion, the project SecProPort was presented to the interested public at the booth of project coordinator dbh Logistics IT AG. SecProPort's goal is to systematically develop a security architecture for the communications

based on the in-depth analysis of cyber threats. Sophisticated countermeasures against cyberattacks should always be kept up to date - after all, more than 90 percent of intercontinental goods are transported by sea.

Project Coordinator Karin Steffen-Witt (dbh) and Dr. Nils Meyer-Larsen (ISL) participated in the conference „Digitalization and cyber security threats in the transport and logistics industry". According to the speakers, companies in the transport and logistics industry increasingly become victims of cybercrime due to the advancing digitization of processes. The speakers from Transported Asset Protection Association (TAPA), Deutsche Post DHL, Funk Group and DB Schenker reported on the current cyber risk landscape and presented sector-relevant threat scenarios for the transport and logistics industry. Furthermore, new innovations in cybersecurity were presented. The representatives of SecProPort discussed possible synergy effects and cooperations with individual speakers.

SecProPort is funded by the German Federal Ministry of Transport and Digital Infrastructure within the IHATEC program and has a duration of three years.

Contact: Dr. Nils Meyer-Larsen meyer-larsen@isl.org
Details: www.isl.org/en/projects/secproport
Photo: ISL

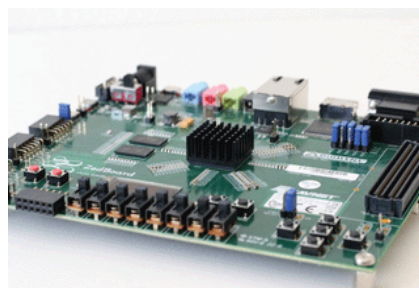# Innovation Workshop on the Supply Chain Day 2019 at BIBA

On the occasion of the Supply Chain Day on April 11th, 2019, BIBA - Bremer Institut für Produktion und Logistik GmbH organized an innovation workshop on the subject of digital logistics together with the Mittelstand 4.0-Kompetenzzentrum Bremen and the LogDynamics research cluster. An exciting program was offered with practical lectures and demonstrations of the latest research results on the topics of digital communication, digital service, digital transport, digital cargo handling and digital product. At a World Café, 90 participants identified the potential of digitalization for their companies and discussed the opportunities and challenges with experts from industry and research. The results of the workshop were recorded graphically by the artists Andrea Reil and Kerstin Hildebrandt. The results were consistently positive: The guests praised the practical relevance in the form of industry lectures and demonstrations as well as the workshop format World Café as a good framework for the exchange about possibilities and requirements of digitalization in logistics.

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Photo: Jan Meier, BVL

DFKI at the HMI 2019: Self-checking Systems

Computer systems need to be checked for correctness prior to market launch. However, because of time constraints and the complexity of today's computers, a full verification is often not possible. In the SELFIE project at the Cyber-Physical Systems department of the German Research Center for Artificial Intelligence (DFKI), a fundamentally new approach is being developed that allows systems to self-verify after production and delivery. Researchers presented the proto-

type of a self-verifying system at the Hannover Messe from April 1st to 5th, 2019, at the DFKI booth.

In Project SELFIE, scientists at DFKI's Cyber-Physical Systems department, headed by Prof. Dr. Rolf Drechsler, are breaking new ground in how to approach system verification. Equipping devices with additional hardware and software enables them to complete all unfinished verification tasks while in use by the end users. The checks can be accomplished much faster subsequent to delivery since they can be limited to the actual functionality, whereas the verification performed in the design phase must take all possible use scenarios into account. The manufacturer can react quickly if the self-check reveals errors in the system, either with updates, the disabling of certain functionalities, or if necessary in the worst case, a recall.

Contact: Prof. Dr. Rolf Drechsler Rolf.Drechsler@dfki.de
Details: www-cps.hb.dfki.de/research/projects/SELFIE
Photo: DFKI GmbH, Lisa Jungmann

Calls for Papers ⏏

LDIC 2020 Call for Papers

Deadline for submission: **September 1st, 2019**

The seventh **International Conference on Dynamics in Logistics (LDIC 2020)** will take place from **February 12th to 14th, 2020 at the University of Bremen**. The dynamics of logistics processes and networks will be the focus of the conference organized by the research cluster Log*Dynamics*. The spectrum of topics ranges from modelling, planning and control of processes, supply chain management and maritime logistics to innovative technologies and robot applications for cyber-physical production and logistics systems. Scientific papers can be submitted until September 1st, 2019.

Proposed topics may include:
● Supply Chain Management and Coordination
● Maritime Logistics
● Cyber-Physical Production and Logistic Systems
● Sensors and Sensor Networks in Production and Logistics
● Artificial Intelligence in Logistics
● Advanced Modelling and Optimization Methods
● Big Data in Logistics
● Human-Centered Logistics

Contact: Aleksandra Himstedt info@ldic-conference.org
Details: www.ldic-conference.org

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Call for Papers: Advances in Thoughts and Approaches for Transport and Logistics Systems Performance Assessment and Investment Appraisal

Deadline for submission: **September 30th, 2019**

The aim of this special issue of "Transport Policy" is to broaden the academic discussion within transport system analysis and economic evaluation. It underlines the importance of advancing the theoretical understanding of transportation and logistics value and valuation from multiple fields and domains, with applications ranging across system investment appraisal, competitiveness and

performance management, uncertainty and risk management etc.

Proposed topics may include:
- Competitiveness and benchmarking analyses of logistics and transportation systems
- National-level logistics costs and state of logistics in different parts of the world
- Systems performance dimensions related to national and regional logistics systems in different parts of the world
- Advances within cost-benefit analyses and performance management systems, and infrastructure and service provision at different levels of analysis
- Empirical studies about logistics and transportation performance management
- Performance and competitiveness of relevant stakeholders of the logistics and transportation systems such as ports, shipping lines and logistics service providers
- Studies on the effects of performance evaluation and ranking of transportation and logistics systems
- Investment appraisal methods and big data

Contact: Prof. Dr. Aseem Kinra kinra@uni-bremen.de
Details: www.journals.elsevier.com/transport-policy/call-for-papers/logistics-systems-performance-assessment-and-investment

SysInt 2020 Call for Papers

Deadline Abstracts: **November 10th, 2019**
Deadline Full Papers: **February 20th, 2020**

The **International Conference on System-Integrated Intelligence (SysInt)** is a cooperation event between the Universities of Bremen, Hanover and Paderborn. The fifth edition will take place from June 3rd - 5th, 2020 in Bremen. Log*Dynamics* is one of the co-organizers. SysInt deals with the integration of new, intelligent functionalities into materials, components, systems and products. Abstracts of the scientific contributions on the following topics can be submitted until November 10th, 2019:

- Intelligent Systems: Enabling Technologies and Artificial Intelligence
- The Future of Manufacturing: Cyber-Physical Production and Logistic Systems
- Pervasive and Ubiquitous Computing
- Structural Health Monitoring
- Systems Engineering
- Soft Robotics and Human-Machine-Interaction

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Details: www.sysint-conference.org, www.sysint-conference.org/callforpapers.html

Publications ⏏

ISL Presents Study Results on International and National Developments for more Sustainability in Ports and Shipping

Worldwide, maritime transport has risen steadily and reached around 12 billion tons in 2018, representing a transport volume of around 59 trillion ton-miles. Even though maritime transport as a whole is still one of the most efficient modes of transport with the lowest specific energy consumption, the cons-

tantly growing international exchange of goods and thus the large volume of shipping traffic inevitably results in high emission values of various kinds with effects on flora, fauna and people.

It is obvious that shipping and ports must make more contributions to environmental protection. But what measures are really sustainable and how quickly should they be implemented?
A current publication of the ISL therefore presents the numerous existing and planned activities on an international, European and national level for the two closely interlinked port and shipping sectors in a clear and coherent way, which aim to counter the effects of the maritime transport industry on the environment.

Free summary of the ISL analysis: www.isl.org/de/downloads/greenshipping
Long version: www.shop.isl.org/green-shipping-greenshipping.html
Contact: Andreas Hübscher huebscher@isl.org
Photo: ISL

ISL Shipping Statistics Yearbook 2018 now available

The Institute of Shipping Economics and Logistics offers its customers around the world a unique data service and data-based market knowledge. The experts in the Maritime Intelligence competence field publish annual statistics on the most important submarkets of the maritime industry (dry bulk, liquid bulk, container, general cargo and passenger traffic) as a compact yearbook. This publication offers a broad overview with time series on world trade, seaborne trade, commodity markets and prices, ocean freight and charter rates, shipping and shipbuilding countries, world merchant fleet and orderbook as well as detailed data on cargo handling of more than 400 major seaports around the world. In order to reflect a picture as comprehensive as possible, a large number of international sources of information were evaluated in addition to ISL's own port database.

The yearbook, now in its 41st edition, has long since established itself as an internationally recognised statistical standard work for ship owners, shipyards, ports, shipping companies, banks, consultants, insurance companies and universities.

The Shipping Statistics Yearbook 2018 (432 pages with 506 tables and 128 figures) can be ordered via our webshop.

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Universität Bremen