Log*Dynamics* Newsletter May 2018

Projects

New Competence Center in Bremen Supports SME in Digitalization

Mittelstand 4.0-Kompetenzzentrum Bremen offers medium-sized companies in the Bremen region and, in addition, support in increasing their digitization skills. In particular, specialists and executives in the innovation clusters Maritime Economics and Logistics, Wind Energy, Aerospace, Automotive and Food and Beverages are to be made aware of digitization, qualified and trained to become „Digital Ambassadors".

The center of Bremen offers competent contact persons and offers suitable for the target group in the following areas:
- Digital Communication: WFB Bremen
- Digital Service: The Bremer Institut für Produktion und Logistik (BIBA) provides information on digital, cooperative business models between partners from different sectors.
- Digital traffic: new forms of cooperation. In northern German ports, and digital value-added services. For example, to increase safety in maritime trans port, will be tested and demonstrated at OFFIS in Oldenburg.
- Digital Transhipment: The digitization of goods handling and port hinterland traffic
  is the focus of the Institut für Seeverkehrswirtschaft und Logistik (ISL).
- Digital product: 3D data, tools for digital recruiting or competence manage ment of personnel are focal topics at the Fraunhofer Institute for Computer Graphics Research IGD in Rostock.

The SME 4.0 Competence Center Bremen
- informs in dialogues, company visits, regional forums, trade fairs, social media and newsletters,
- demonstrates new digital applications in DigiLabTouren,
- qualified with webinars and innovation workshops and
- supports implementation with dialogue platforms, potential projects, imple mentation projects and digital ambassadors.

The middle class 4.0 Competence Center Bremen is headed by Wirtschafts-förderung Bremen GmbH (consortium leader). Partners are the Bremer Institut für Produktion und Logistik GmbH (BIBA), the Institut für Seeverkehrswirt-schaft und Logistik (ISL), Fraunhofer IGD / Fraunhofer IDMT and OFFIS. On 9th of April the kick-off event was held in BIBA.

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Understanding the Internet with the „Nœrdman"

The „Nœrdman" patiently explains the world of the Internet to his environment: What are Instagram and Snapchat? Is Google the internet? The „Nœrdman" is a cartoon character who combines a passion for technology with North German humor. Every Monday, a new comic about technology, nerds and the north appears.

The comic series was developed by the Bremen computer scientists Professor Rolf Drechsler and Jannis Stoppe. „The basic idea of the comic is to convey to the readers topics of the Internet in an easy-to-understand and humorous way," says Drechsler. He leads the AG Computer Architecture (AGRA) in the Department of Mathematics / Computer Science of the University of Bremen and the research field Cyber-Physical Systems of the German Research Center for Artificial Intelligence (DFKI) in Bremen. Jannis Stoppe completed his doctorate in AGRA in 2017 and is now a staff member at the German Aerospace Center (DLR). „We want to use the comics to put interesting questions and observations from technical computer science into the room," explains Stoppe. „Of course, academic content can only be conveyed to a limited extent in four images, but the fascination for computers and technology can often be aroused by the fact that it makes clear how crazy the current technologies actually are on closer inspection." Rolf Drechsler and Jannis Stoppe would like to join make their comics desire for knowledge - even and especially when the reader is a layman.

„The Nœrdman is the nerd from the north - both technically interested and a little cranky, as well as bremisch-calm in the mind. The fact that the ligature - the combination of two letters to an unusual type of printing - also stands for „without limitation" is no coincidence, „reveals Stoppe.

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Details: www.noerdman.de with all Nœrdman-Comics
Photo: University of Bremen

Augmented Reality-based Assistance System for the Maintenance of Complex Heating, Air Conditioning and Cooling Technology (KlimAR)
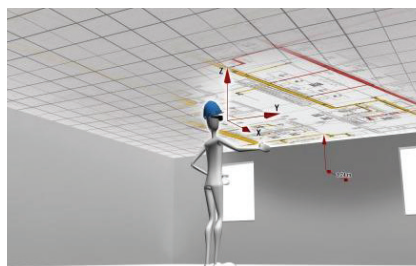
In the course of the stable development of the German construction industry, the heating, ventilation and air conditioning industry is experiencing steady growth in employment. In addition to a growing shortage of skilled workers, the increasing networking of the working world creates new challenges for technical staff. As a result, all employees involved in a work process have to be provided with all the information in real time that is needed to complete a work task. Technologies such as augmented reality are particularly suitable, which enrich reality with virtual information. Therefore, BIBA is developing an augmented reality-based assistance system to support service technicians in the maintenance of complex heating, air-conditioning and refrigeration systems, together with AnyMotion GmbH in the KlimAR project.

For a needs-based development of the KlimAR system, the later users are

directly involved in the development. The requirements for the system are surveyed directly in the field of application and analyzed with regard to system development. By providing prototypes, early tests and evaluations can be carried out in practice. This allows the KlimAR system to be adapted to the needs of the user group on an ongoing basis based on current Augmented Reality hardware.

The aim of the KlimAR assistance system is to support the service technicians in the workflow during the maintenance of complex heating, ventilation and air conditioning systems. Through the use of data glasses, the preparation and provision of technical documentation in the work process, orientation and work support with the help of virtual additional information as well as an adaptation of the used documents by means of interaction with the displayed content will be made possible. This is intended primarily to reduce search efforts in the maintenance process and to support documentation tasks.

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Photo: AnyMotion

EU Project Develops Safe and Intuitive Collaborative Industrial Robots with DFKI Drives

To make the cooperation of humans and robots safe and efficient - that was the aim of the joint project FourByThree, which was partly funded by the European Union. The Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI) headed by Prof. Dr. Dr. h.c. Frank Kirchner developed technologies that enable intrinsically safe robotic behavior. Seventeen international partners from industry and research participated in the project with a total budget of 6.9 million euros under the coordination of the Spanish research center IK4-TEKNIKER.

Even today, conventional robots meet the requirements of many industrial applications: they offer a high level of skill, accuracy and efficiency. However, they fail at the latest when it comes to safe cooperation with a human operator - especially when man and machine share the workplace. Since 2014, researchers in the EU project FourByThree have been working on breakthrough robot solutions that are able to work safely and efficiently with human operators in industrial manufacturing companies. Three years of successful development resulted in hardware as well as software technologies that are suitable for human-robot collaboration, easy to program and operate. Thanks to the modular approach of the project, most of the results can be integrated into other robot systems already existing or under development in the market.

FourByThree solutions are accessible through an online platform. FourByThree has helped make the vision of people and robots working hand-in-hand in industrial production a reality soon. The hardware and software solutions developed in the project were tested in four pilot scenarios and focus on various industrial processes: assembly, machine maintenance, welding, riveting and demurring.

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Photo: DFKI GmbH

Agile Virtual Testing: Alignment of Tesing Environments (AGILE-VT)

The implementation of the vertical and horizontal consistency within the functional test process of avionic systems is the main objective of the German national research project AGILE-VT.

The first level of consistency focuses on interoperability in the vertical and horizontal linkage of test environments. For this purpose, the test preparation and test execution is optimized to such an extent that it is not restricted to a specific test environment. It should be portable to other test environments at a significantly lower cost than at present.

The second level of consistency focuses on the interoperability in test development and design support during the test preparation. For this purpose, the phase of test case creation is optimized so far that test cases can be exchanged across the boundaries of test departments in a common standard. In addition, the reusability of results from the test process will be increased by preparing them and suggesting them to the test engineer as part of design support.

The two listed groups of technological goals follow the main goal of consistency and will result in the achievement of interoperability in functional testing of aircraft.

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Robocademy: Project Completion after Four Years of Successful Training and Networking
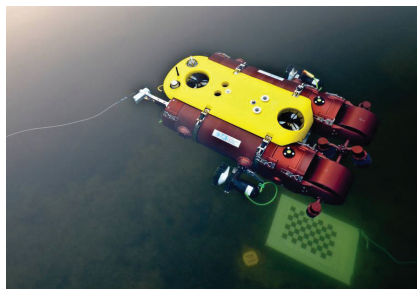
Training together and developing robotic systems to explore the oceans: this is the goal launched by Robocademy, the European training and research network for underwater robots, some four years ago. The project, funded by the European Union with approx. 3.61 million euro and coordinated by the Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI), was completed in December 2017. Project partners as well as participants of the program draw a very positive balance.

Supported by leading research centers and companies from the fields of robotics, marine technology, marine science and the offshore industry, the Robocademy offered a total of 13 junior scientists first-class training and research conditions as well as the opportunity to earn a doctorate in selected and excellently supervised research projects. The focus of the training was on the development of robust, reliable and autonomous robot systems. „With the Robocademy, we have been able to train underwater robotic specialists that are urgently needed to ensure the international competitiveness of European science and industry. In addition, the project has created a network of cutting-edge European research in this sector „, says Prof. Dr. Dr. H. c. Frank Kirchner, head of the DFKI Robotics Innovation Center.

The Robocademy was funded under the Seventh European Research Framework Program as a Marie Curie Initial Training Network (ITN).

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Collaborative Robot-Robot-Human Interaction for Fruit Laying (CooPick)
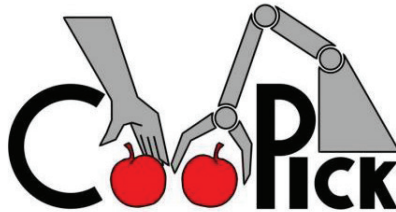
Depending on flexibility and capacity requirements, placing fruit on convey-ors is either completely manual or fully automated in large plants. Affiliated to the process is a quality control and a final packaging. Against this background, large rationalization potentials for medium flexibility and capacity requirements can be identified by partial auto-mation. The aim of the project is the development of a collaborative fruit lay-up system, which is freely scalable in terms of both employee and robot use and can support automated handling, quality control and packaging. The system should be universally applicable and can be adapted quickly to different types of fruit depending on the season. An essential feature is an intuitive work orga-nization between human and robot.

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Integrated Adative Interaction System for Intermodal Mobility (adamo)

Being mobile, being able to decide for themselves when and how a journey should go where they can and do it independently of others - that is hardly possible and still wishful thinking for the majority of people with physical disabilities. Even if suitable means of public transport are available: even the first change represents an insurmountable hurdle for many impaired people. That does not have to be the case, as we know at the BIBA - Bremer Institut für Produktion und Logistik at the University of Bremen. In the new project „adamo" it is now exploring the possibilities for a solution to this problem.

The one-year project adamo (long title: Holistic Adaptive Interaction System for Intermodal Mobility) is funded by the German Federal Ministry of Education and Research (BMBF) with the main focus on „Human-Technique Interaction" (MTI) of the program „Bringing technology to people". The funding priority covers the topics „Intelligent Mobility", „Digital Society" and „Healthy Living". Associated partner in the project is the station mission Bremen. The project is being accompanied by the project sponsor VDI / VDE Innovation + Technik. By the end of the year, the research results should be available.

The main subject of the research project adamo are autonomous micro-ve-hicles as helpers in changing trains. They are intended to provide intermodal travelers with intelligent assistance: by means of their paths between stops on the bus, tram or metro and trains, including by elevator or escalator. Problems especially overcoming height differences. The focus of the project is on entry, exit or walking aids and passenger and baggage transport.

The research will initially focus on the obstacles and needs of intermodal travelers and should be supported by data collection.

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## Maritime Regional Network for Integrated Digital Working and Learning (MARIDAL)

The objective of MARIDAL is the establishment of a regional, industry-related maritime transfer network that will initiate activities in the sense of a „digital pilot" on the subject of digital learning on ships and in the port, as well as qualifying for the digitized port world. The main application areas are the digitized maritime supply chain, the Smart Shipping, and the Digital Port. The focus is on the small and medium-sized enterprises (SMEs) in the maritime sector, as the resources for linking pedagogy and didactics, technology and organizational development are often lacking in SMEs and there is a need for learning from and among themselves. As a result, synergies can be exploited and competencies for the development of intensified knowledge transfer and qualification concepts can be built commonly.

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Feedback Mechanisms Across the Lifecycle for Customer-driven Optimization of iNnovative Product-service Design (FALCON)
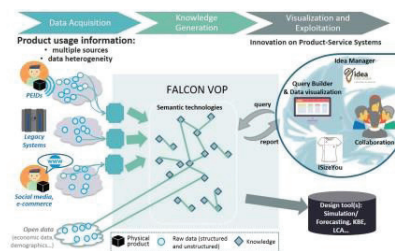
FALCON (Feedback mechanisms Across the Lifecycle for Customer-driven Optimization of iNovative product-service design) was an EU-funded research project, aimed at gathering and processing usage data. After three years of research and development, the FALCON project has been successfully completed, providing an open, virtual platform for the product service system and product lifecycle management.

To enable complete interoperability, even in a heterogeneous IT environment, the FALCON platform incorporates a multi-system approach with two logical layers. The technical layer collects and semantically captures the feedback from the usage phase, both from users (e.g. via social media) and from products (e.g. via sensors). The business logic layer then processes and analyzes this data. With use of semantic data model, cross-sectoral search capabilities to exploit PLM information are offered. For comprehensive analysis, the platform also incorporates simulation and prediction algorithms. The focus of BIBA's research was the systematic integration of concepts and tools of Knowledge Based Engineering that allow the complete transition up to an automated adaption of the design of products and their services. The project was coordinated by BIBA with 13 partners from eight different countries.

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Decision-Making Tool for Adaptive Designing of PPC-Methods for Contract Manufacturers of Dynamic Collective Orders in Aviation Industry (JobNet 4.0)

Within the collaborative project JobNet 4.0 the BIBA developed a decision-making software tool. It especially helps small and medium-sized aviation enterprises to find the right methods of production planning and control (PPC) for alternating order situations. This tool is compatible with existing software systems, thus, it can be quickly integrated into the PPC processes, and it is transferable to other industries such as mechanical engineering or the automotive industry. Project partners were Quast Praezisionstechnik GmbH and FMM Finkenwerder Metall- und Maschinenbau OHG operating in Hamburg.

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Photo: AIRBUS / H.Gousse

Redesigning Welding Profile for the Needs of Industry 4.0 (WELD 4.0)

WELD 4.0 is going to innovate the Welding VET by updating the European Welder profile, to harmonise and standardise requirements and training standards across Europe. The enhanced profile is also addressing new technologies in the context of Industry 4.0. Based on that profile, innovative tools are developed, including new approaches of teaching and learning using methods for skill and competence development such as Game Based Learning, Simulators and Serious Gaming. The new approach is piloted through hands-on approach seminars in three different industrial countries in Europe: Germany, Portugal and the UK.

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Cowarehousing

In this project, an IT-supported cowarehousing platform and a corresponding business model should be designed, implemented, tested and evaluated so that shared, small-scale and short-term storage uses are possible. Cowarehousing is an equivalent approach to sharing living space (airbnb) in logistics and provides a better balance between utilization and overcapacity. Providers could rent out unused storage space via the platform in a small-scale and short-term manner to corresponding customers, thereby increasing their added value. The platform aims to automate the matching of supply and demand using machine learning approaches. The platform is also intended to support the various parties in contract design, usage-based billing and distributed inventory management.

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## Development of a Highly Flexible Picking System (LoRaLight)
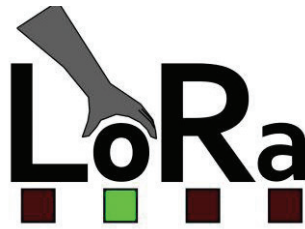
Picking is a core process of intralogistics tasks and pursues the goal of compiling deliveries according to customer order; the deliveries are thus subsets of the entire product range. The installation of complex and wired infrastructure systems that supports efficient picking procedures is expensive and also poorly adaptable to a changing warehouse infrastructure. An additional problem in the area of quality assurance of the picking process is the monitoring of the correct picking processes (picks). This is especially true when picking from non-sorted subjects has to be executed as well as the simultaneous processing of multiple orders, in which an item that has been picked takes place in order-specific containers on a picking trolley. In the project, this gap is to be closed by developing a picking system that can be easily and inexpensively integrated into an existing warehouse infrastructure, maintaining a high degree of flexibility of adaptation and ensuring high quality standards. The maintenance effort should also be significantly lower than with conventional wireless systems. The system to be developed represents a deliberate departure from the development trend of continuous automation of warehouses and picking processes.

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## Development of Autonomous Model Vehicles
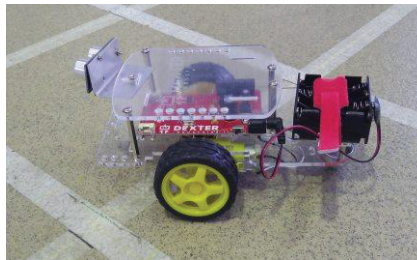
Autonomous driving the area of automobile manufacturers is in a stage between prototypes and series production. To enable students with relevant skills in this direction, Tobias Sprodowski offers a project for student of the University of Bremen to work across disciplines on this topic as part of the research network Log*Dynamics*. The student project is splitted into four individual projects: construction and control of vehicles; individual localization of the vehicles; design and implementation of a graphical application for the operation of vehicles and evaluation of measured data and, development of a predictive controller (MPC) for collision avoidance. The basis of the autonomous model vehicles are Raspberry Pi boards enhanced by a GoPiGo vehicle kit, which are supplemented by Marvelmind beacons for exact position detection.

The groups usually consist of six to seven undergraduate or graduate students. They will increase their experience in the execution of a requirement-specific development as well as the communication and coordination between the working groups involved.

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Development of a Fully Automatic Fermenter with Automatic Determination of the Fermentation State (F.I.T. Gaerautomat)
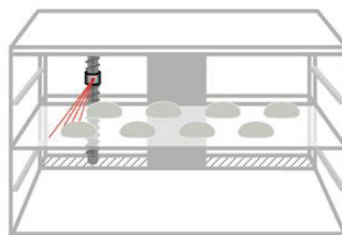
In industrial bakery production, a lot of time is spent on determining the optimum

fermentation state by baking experts. Achieving the optimal fermentation state purely on the fermentation time and ensuring compliance with the machine-side fermentation and cooling parameters is thus impossible in both branch operation and in industrial operation according to current state of development. The project develops a novel fermentation system (fully automatic proofer) with integrated measuring technology and a special software solution, that detects the current maturity automatically and reproducibly without having to interrupt the fermentation process. The system should be cost-effective, adaptable (large product range) and easy to use. Additionally, the system should be able to specify process leveling.

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Development of a Process to Improve the Crushability of Packaging Solutions Made of Expanded Polystyrene (EPS) (CrushPack)


Online sales of fresh and frozen food (E-Food) requires a specialized packaging solution. Thereby, specific technical, economic and environmental requirements as well as the user experience have to be considered. Usually, this packaging is made of expanded polystyrene (EPS) and Styrofoam. The storage and disposal of these, comparably bulky EPS packaging is very difficult for private households and reduces the acceptance of E-Food. Therefore, the objective of this project was to modify EPS packaging in order to increase its crushability and simplify its storage and disposal, while retaining its thermodynamic properties. The task of the BIBA focused on the theoretical and simulative development of a product and process model for the integrated simulation and optimization of the manufacturing process.

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## System Technology and Virtual Testing (STEVE)

The main objective of „STEVE" aims in the development of an environmentally friendly air traffic system. Here, two strategic objectives are pursued. The first objective focuses on the development of environmentally friendly system technologies. Examples include inter alia lighter components or new power supplies (fuel cells) and their input into the aircraft. The second objective addresses the improving of development efficiency and thus is an essential precursor for the development of environmentally friendly systems - especially against the background of increasing system complexities in shorter development times.
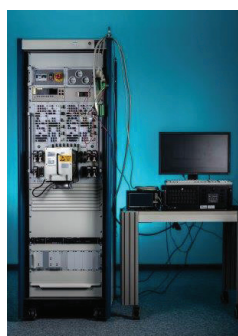
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Development of an Unmanned Aerial Vehicle (UAV) with an Attachment Mechanism for the Automatic Inspection of Wind Turbines (InspectionCopter)
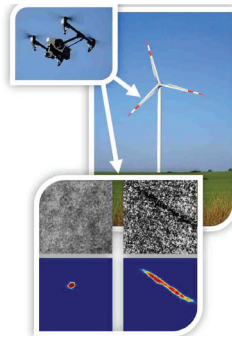
The regular inspection of the rotor blades is necessary for the operation of wind turbines in order to prevent downtimes due to undetected faults. With hub heights up to 160 meters and rotor blade lengths up to 88 meters this constitutes a serious challenge. Currently this is accomplished by specialized industrial climbers who climb to the gondola of the site and rappel to the rotor blade. This procedure not only puts the climbers in danger, but also produces considerable costs as well as long downtimes.

In this project we approach this problem by developing a UAV for the automatic inspection of wind turbine rotor blades. The UAV automatically scans the rotor blades for surface defects using optical sensors and machine learning methods. The UAV should carry a payload of approximately 1 kg, i.e. a high-resolution camera for inspection, a camera for navigation and the attachment mechanism. An attachment mechanisms further allows the UAV to establish mechanical contact with the rotor blade in order to inspect the functionality of the built-in lightning arrester. The maximal weight at take-off should be approximately 3 kg, which is why a particularly light structure is to be developed in the course of this project. To achieve this, a selective laser sintering process is utilized to additively produce a copter chassis including joints as well as integrated air and cable channels.

The aim of this project is to substitute the regular inspection of wind turbine rotor blades by specialized industrial climbers. The deployment of climbers could then be limited to the repair of faulty rotor blades detected by the Inspection-Copter. This would not only decrease the maintenance costs of wind turbines but also the associated downtimes.

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The Brazilian-German Cooperation Project AdaptiveSBO Completed
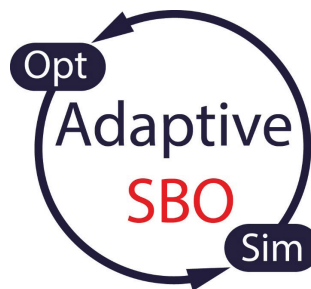
Within the scope of the project AdaptiveSBO (An adaptive simulation-based optimisation approach for the scheduling and control of dynamic manufacturing systems), a research group comprising members of the BIBA and the Production Engineering Department of the Federal University of Santa Catarina, Florianópolis, Brazil, jointly developed a simulation-based optimization method for the adaptive control of dynamic job-shop production systems. The method was evaluated on the shop floor of a Brazilian manufacturer of mechanical components for the automotive industry and achieved a significantly better performance than the company's standard planning method used so far. The project was funded within the BRAGECRIM program (Brazilian German Collaborative Research Initiative on Manufacturing Technology) by the German Research Foundation (DFG) and its Brazilian counterpart CAPES in the period from April 2016 until March 2018.

The planning and control of production processes has a significant influence on the performance of production systems. In particular, job-shop production systems are subject to dynamic influences (e.g. disruptions due to machine breakdowns or rush orders), which lead to changes in the state of the system.

After a change in the state of the production system, previously calculated production plans or sequencing rules may be inefficient for the new situation. In such cases, traditional planning and control approaches are unable to incorporate the dynamic system changes. In order to determine suitable control rules always based on the current system state, the project developed a framework for data-exchange between a real production system and the simulation-based optimization process. Based on this, the method selects appropriate control rules in real time and transfers them to the Manufacturing Execution System (MES) of the underlying real production system. As a result, the method responds to dynamic changes in the state of a production system in real time and is therefore particularly suitable for controlling dynamic job-shop production systems.

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Personnel Changes ▲

Prof. Dr.-Ing. Katja Windt Changes to Industry

After four years as head of the Jacobs University and 14 years as a member of Log*Dynamics*, Prof. Dr.-Ing. Katja Windt has been dedicated to new tasks. Since January, she has been the Managing Director of the Electrical, Automation and Digitalization Division of the SMS Group. SMS is a family-owned company in plant construction and mechanical engineering for the processing of steel and non-ferrous metals. The SMS Group has sales of around three billion euros in 2016 and around 13,500 employees worldwide.

For ten years Katja Windt worked at the Jacobs University, first as a professor of production logistics, then as a Provost and in recent years as President. At the beginning of her presidency, Jacobs University was in an economically challenging situation. Together with her managing director colleague Prof. dr. Michael Hülsmann, also member of Log*Dynamics*, restructured the range of subjects offered, reduced jobs and implemented numerous austerity measures.

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Awards ▲

Most Innovative Solution Award at I-ESA 2018 in Berlin

Quan Deng, Suat Gönül, Yildiray Kabak, Nicola Gessa, Dietmar Glachs,Fernando Gigante, Violeta Damjanovic-Behrendt, Karl Hribernik and Klaus-Dieter Thoben received the Most Innovative Solution Award for their paper on' An Ontology Framework for Multisided Platform Interoperability'. The paper has been presented by Quan Deng from University of Bremen at the I-ESA 2018 – 9th International Conference on Interoperability for Enterprise Systems and Applications. University of Bremen and BIBA have long been contributing to the research field of interoperability through several research projects. This paper is a result of the research project NIMBLE (Collaborative Network for Industry, Manufacturing, Business and Logistics in Europe), funded by the European Commission under the H2020 grant agree-

ments.

The main contribution in the article is an ontology framework designed to enhance interoperability of activities and transactions performed via the digital Business-to-Business (B2B)-Platform "NIMBLE". To achieve this, the article present an approach that involves two core ontology modules, e.g. the Catalogue Ontology and the Business Process Ontology, which can be extended by adding specific domain ontologies. For the representation of certain business aspects, the Catalogue Ontology exploits the Universal Business Language (UBL), while for the description of product characteristics related to different domains, the ontology makes use of the relevant industrial standards. The Business Process Ontology encompasses machine-readable vocabularies for the semantic description of business processes, and could be extended by adding new ontologies or data schemas. The I-ESA conferences address topics related to Enterprise Interoperability to lead and generate an extensive research and industrial impact in the field of interoperability for enterprise software and applications.

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Internationalisation ⏏

Erasmus+ Exchange with University of Évora Agreed

In January 2018, Prof. Dr. Teresa Gonçalves, professor at the Department of Informatics, University of Évora, Portugal, and Erasmus Mundus partner of the IGS visited Log*Dynamics*. She took part in the workshop „The Art of Presenting Yourself". The universities of Évora and Bremen agreed an Erasmus+ exchange for the future. From now on, an exchange of students and staff members between the different faculties of Log*Dynamics* and the according counterparts in Évora will be possible.

At the University of Évora Teresa is responsible for several courses of undergraduate, masters and Ph.D. studies in the Informatics Engineering area. She conducts research in text mining, automatic image classification and recommender systems. She was head of the Informatics Department for four years. Currently, she is the director of the Informatics Engineering bachelor program. She is also the local coordinator of the Erasmus Mundus projects FUSION, LEADER and gLINK. Furthermore, she has been involved in several nationally funded applied research projects.

By the way: Teresa evaluated the IGS workshop to be „excellent" and will come back to Bremen to participate in the advanced course. ;-)

Contact: Dr.-Ing. Ingrid Rügge rue@biba.uni-bremen.de
Details: www.logistics-gs.uni-bremen.de/158.html?&L=0; www.erasmusmundus.logdynamics.de/erasmusmundus.html

Cooperation with the Federal University of Santa Catarina, Florianopolis, Brazil

The department „IPS - Intelligent Production and Logistics Systems" headed by Prof. Dr.-Ing. Michael Freitag at the BIBA has a

long-lasting cooperation with the Production Engineering Department of the Federal University of Santa Catarina (UFSC), Florianópolis, Brazil headed by Prof. Dr.-Ing. Enzo Morosini Frazzon. Within the scope of of the collaborative project AdaptiveSBO (An adaptive simulation-based optimisation approach for the scheduling and control of dynamic manufacturing systems), Mirko Kück, a researcher of the department of System Design and Planning at the BIBA, visited the Brazilian university for a research stay of one month between February and March 2018.

During the research visit, Mirko Kück coordinated the international project team of five professors, three PhD students, four master and three undergraduate students together with Prof. Frazzon in order to conduct the remaining tasks to finish the project. In this context, among other things, the article „Data-driven production control for complex and dynamic manufacturing systems" was completed, which has now been accepted for publication in the journal CIRP Annals - Manufacturing Technology. Another important topic of work was the discussion of future possibilities to continue the cooperation.

Contact: Mirko Kück kue@biba.uni-bremen.de

Trio Back from the Big, Wide World

We, that is Marius Schwab and Nicolas Kassel, are currently studying production engineering at the University of Bremen in different semesters. In 2017 both of us applied for an ERASMUS MUNDUS funded gLINK mobility of the IGS. gLINK offers students, doctoral candidates and lectures scholarships to stay at one of the Asian partner universities and vice versa. Our journey started in September: one whole semester abroad.

Marius visited the Universiti Putra Malaysia and Nicolas the University of Peradeniya in Sri Lanka. Both universities have a splendid reputation and hence attract a number of foreign students from all kinds of backgrounds. During our time there, we took part in lectures, group works and projects, such as the development of a fire extinguisher or a sustainability analysis of tea production. While doing so, we got the opportunity to strengthen our theoretical and practical skills.

One thing in particular caught our attention: The contact between mentor and student is very close. Lecturers call most students by name. We are not used to this dependency in our home faculty. Both of us often spent the weekends traveling and exploring the beautiful country and its people. Doing so we have learned quite a lot about the hosting country, its culture, but first and foremost about ourselves. Especially the personal development which inevitably comes with such a stay, for example trough the high amount of independency which is necessary to get all papers done, caught us by surprise.

The third one on board is Dr.-Ing. Ingrid Rügge. She stayed with a gLINK scholarship in Thailand. Her aim was to strengthen the already existing cooperation and to create new opportunities for further exchange. All of us would like to encourage everyone to seriously consider to apply to a similar program. It's worth it in any case!

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Details: www.erasmusmundus.logdynamics.de/220.html

Second TTU SummerCamp in Bremen

The second „TTU PhD SummerCamp" takes place from 15 March to 15 June 2018 at the University of Bremen. The BIBA is hosting three university lecturers from Ethiopia, who are completing a doctoral program under the leadership of the Texas Tech University (TTU).

Background to the project: The German Society for International Cooperation (GIZ) promotes the establishment of centers of excellence in African countries. The Texas Tech University (Lubbock, Texas, USA) runs such a program in collaboration with the Jimma Institute of Technology (Jimma, Ethiopia). The 18 doctoral candidates stay for international experiences in Bremen. The first cohort came in 2017 for 3 months.

The three guests of this year are doing their PhD in road construction and water resources. They conduct their research at the University of Bremen with the support of the International Graduate School for Dynamics in Logistics (IGS). To support them in an appropriate way the IGS cooperates with the company INROS LACKNER SE. INROS LACKNER SE operates worldwide and in many countries in Africa. It also carries out projects in Northern Germany. Thus, the PhD students will be able to visit several construction and maintenance sites as well as research institutes during their mobility. This gives them valuable insights into the practice.

The scientific program will be completed by a research seminar from May 22 to June 1. Dr. Dave Louis is Associate Professor of Higher Education of the TTU. The seminar entitled „Proposal Writing, Professional Presentations and Publications" actively supports doctoral candidates in structuring their dissertations and their research processes. The course is open to the doctoral researchers of Log*Dynamics*.

Upon return, the Ethiopian lecturers can apply the gained expertise to their research as well as to pass it on in teaching or translating it into economic practice

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Details: www.logistics-gs.uni-bremen.de/467.html?&L=1; www.logistics-gs.uni-bremen.de/courses.html

Events ▲

Log*Dynamics* Participates in BreakBulk Europe 2018

Date: **29th – 31st of May 2018**
Venue: Bremen

Experts around the world are responsible for sensitive and, in most cases, high quality cargo. The experts have for years a recognized industry meeting: the conference and exhibition „BreakBulk", which has been held since 2006 in Antwerp. From the 29th to the 31st of May 2018 the fair will be held in Bremen for the first time. The research cluster Log*Dynamics* participates in the international industry event as a co-exhibitor at the booth of the Bremen ports. A total of 29 co-exhibitors from the region will be present at the 192 m2 booth. We look forward to your visit in the hall 5!

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.breakbulk.com/events/breakbulk-europe-2018

Engineers from all over the World Come to Bremen for the European Test Symposium

Date: **28th of May - 1st of June 2018**
Venue: Bremen

The University of Bremen has succeeded
in bringing one of the most important conferences for testing electrical circuits and systems to the Weser. From 28th of May to the 1st June, 2018, the 23rd European Test Symposium (ETS) will take place there for five days.

It is supported by the Deutsche Forschungsgemeinschaft (DFG) and funded with a total of 25,000 euros. The conference, hosted by the Hotel Swissôtel, will be chaired by Professor Rolf Drechsler. He is the head of the Computer Architecture working group in the Department of Mathematics / Computer Science at the University of Bremen and the Cyber-Physical Systems Research Unit of the German Research Center for Artificial Intelligence (DFKI) and is a member of Log*Dynamics*.

The 23rd European Test Symposium is an event of the Institute of Electrical and Electronics Engineers (IEEE), whose worldwide professional association includes engineers from the fields of electrical engineering and information technology. The ETS presents new ideas and trends in the field of testing and reliability of electrical circuits and systems. Topics covered include digital and analog circuit testing, testability improvement, and cost reduction. In addition to classical computer chips, the examination of novel technologies such as microfluidic chips is also discussed. The participants come from both science and industry. The registration process has already begun.

In conjunction with the ETS, the three-day Test Spring School (TSS) will take place from 25 to 28 May 2018 at Schloss Etelsen in Langwedel. There the challenges of modern security technologies are presented. This year's focus is on the security of hardware. The Test Spring School is aimed specifically at junior scientists and doctoral candidates.

Contact: Prof. Dr. Rolf Drechsler drechsler@uni-bremen.de
Details: www.ets18.de
Photo: University of Bremen Lisa Jungmann

4th International Conference on System-Integrated Intelligence (SysInt 2018) Intelligent, flexible and Connected Systems in Products and Production

Date: **19th - 20th of 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 tech-

nology through an experimental shop floor tour. Complemented by a dinner, the conference will provide abundant opportunities for vibrant discussions and networking.
The conference program is now available.

Contact: Aleksandra Himstedt info@sysint-conference.org
Details: www.sysint-conference.org
Photo: sliwonik

3rd Log*Dynamics* Summer School - Decision Support in Supply Chain Networks (LOGISS 2018)

Date: **16th - 20th of July 2018**
Venue: University of Bremen

The Bremen Research Cluster for Dynamics in Logistics (Log*Dynamics*) organizes the third Log*Dynamics* Summer School - LOGISS 2018, which will be held from 16th to 20th of July 2018 at the University of Bremen. The goal of this summer school is to forge a seed of young researchers from different disciplines, who share the interest in mechanisms for coordination of logistics processes as well as in the cooperation and competitiveness in supply chains. Therefore, the LOGISS 2018 focuses the topic area of Decision Support in Supply Chain Networks. The courses of the summer school include among others the following topics:

• IT based data mining and data analytics
• Tools and methods for network optimization
• Identification of decision support variables
• Serious gaming

The Log*Dynamics* Summer School is designed for PhD and Master students who work on theses at the interface of Logistics, Computer Science, Industrial Engineering, Economics or related fields. It is encouraged that the applicants have some basic knowledge in modeling, programming, and statistics.

Deadline for application: **1st of June 2018**.

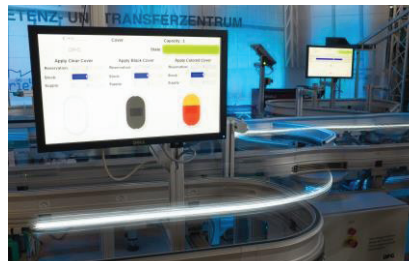Contact: Prof. Dr. Jürgen Pannek summerschool@logdynamics.de
Details and Application: www.summerschool.logdynamics.de

Next Training Course on "Autonomous Control in Production und Logistics"

Date: **10th of September**, **19th of November 2018**
Venue: Bremen

The BIBA factory of expertise on "Autonomous Control in Production und Logistics" offers courses specifically for small and medium-sized companies to help them on their way toward the digital future. This training course applies to small and medium-sized enterprises in Germany and is held in German.

Contact: Michael Teuckete tck@biba.uni-bremen.de
Details: www.biba.uni-bremen.de/industrie/expertenfabrik/qualifizierung.html
Application: www.mitunsdigital.de/veranstaltungen/selbststeuerung-in-der-produktion-und-logistik-4%20
Photo: clabeck.de

Supply Chain Day 2018: Innovation Workshop „Future of Logistics"

On the occasion of the Supply Chain Day on 19th of April the Log*Dynamics* together with the BIBA - Bremer Institut für produktion und Logistik and the Mittelstand 4.0-Kompetenzzentrum Bremen organized an innovation workshop. Under the motto „Future of Logistics", the topic of digitization has been focused. As part of a World Café, the following aspects were discussed: digital communication, digital service, digital traffic and transhipment, digital twin and digital assistants. The results of the innovation workshop were graphically recorded by an artist, followed by the get-together. The roughly 70 workshop participants drew a thoroughly positive balance and praised the World Café format as a good framework for exchanging views on the possibilities and requirements of digitization in logistics.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.tag-der-logistik.de/veranstaltung/4577
Photo: Jan Meier

Satellites See the Sea - Help from Space for the Maritime World

On the occasion of „Yuri's Night" on the 12th of April in honor of the astronaut Yuri Gagarin, who was the first human to see the Earth „from above" for 106 minutes, Dr. Nils Meyer-Larsen presents current developments of the latest generation of earth observation satellites as part of the event series „Science goes Public!". The MarSat project, in which the ISL is involved, is currently developing new innovative services for the maritime industry, such as: the creation of accurate nautical charts of coastal areas using satellite-based bathymetry and innovative ice services. The lecture took place in Bremerhaven's Kapovaz in front of an extensive and very interested audience.

Contact: Dr. Nils Meyer-Larsen meyer-larsen@isl.org
Photo: SCIENCE GOES PUBLIC

Kick-off Event for the Project BREsilient

As part of the research project „BREsilient - climate-resilient future city of Bremen", various scientific institutions headed by the Bremen Senator for Environment, Construction and Transport are investigating what measures can be taken to increase their resistance to climate change. The ISL represents the cluster „Maritime Economy / Logistics" as an important economic factor for the state of Bremen.

The first public discussion opportunity in the project was a kick-off event at the House of Citizenship in Bremen on the 11th of April 2018, to which the project partners had invited to discuss the challenges and the BREsilient approaches - also related to the maritime industry / logistics sector.

„Understanding climate impacts and making preparations" is the motto of the research project „BREsilient", which was written by Environment Senator Dr. Joachim Lohse and project manager Dr. Anna Pechan today together with Silke Kröll, from DLR for the Federal Ministry of Education and Research, and Prof. Dr. Frank Arendt, Managing Director of the project partner ISL Institute of Shipping Economics and Logistics, started at a kick-off conference with around 100 participants from the four model areas.

Contact: Prof. Dr. Frank Arendt arendt@isl.org
Details: www.isl.org/de/news/klimaanpassungsstrategie-vom-senat-verab-schiedet
Photo: ecolo_Fried

ISL with Project PortSec at the MCN

Ransomware, „Bundestrojaner" and data leaks: Cybersecurity poses new challenges for politics and business. It is not just the hacker attack on the shipping company Maersk, causing failure of multiple IT systems, which generates considerable interest in the maritime industry to find out about the protection of critical infrastructures. In view of the increasing interconnection of units on board with each other and with land-based systems, related to remote management and monitoring – there clearly is increasing danger of Cybercrime.

The „Crime Scene Ship: Cybersecurity Maritim" event, organized on 1st March 2018 in Bremen by the Maritime Cluster Northern Germany, demonstrated how attackers achieve their goals and highlighted possible weak points. In addition, it was presented how shipping companies can better protect their IT systems from attacks. ISL's Dr. Nils Meyer-Larsen, project manager of the PortSec project, together with Dr. Karsten Sohr from the TZI of the University of Bremen presented how PortSec contributes to better protecting communication processes in ports.

Contact: Dr. Nils Meyer-Larsen meyer-larsen@isl.org

Success Model Living Lab - Position Paper Calls for Practical and User-Oriented Innovation Infrastructures in Germany

Living Labs offer realistic innovation environments in which new developments can be tested in a user-friendly way. In the now published position paper „Innovation Structures 4.0", thirteen leading German Living Labs - including the Bremen Ambient Assisted Living Lab and the Innovative Retail Laboratory of the German Research Center for Artificial Intelligence (DFKI) - present their performance and measures to strengthen Germany as a location for innovation. The position paper was presented to the professional audience at the 1st Living Lab Forum in Germany on the 26th of February, 2018 in Cologne.

There are more than 100 Living Labs in Germany, and the trend is rising. These are innovation laboratories where prototypes of new products and services are developed and potential users can test their marketability. The position paper „Innovation Structures 4.0" is aimed primarily at innovation policy decision-makers in Germany. It aims to raise awareness of existing Living Lab infrastructures, to highlight their potential for market realizations of new products and services, and to highlight appropriate measures that enhance

their innovative capacity.

The Bremen Ambient Assisted Living Lab (BAALL) and the Innovative Retail Laboratory (IRL) of the DFKI are among the initiators of the position paper, which is funded by the project „Living Labs in the Green Economy: Real Worldly Innovation Spaces for Business Development" funded by the German Federal Ministry of Education and Research (BMBF) User Integration and Sustainability (INNOLAB) „. In the project, the DFKI Research Unit Intelligent User Interfaces develops assistance systems for improved human-machine interaction in the fields of mobility, housing and shopping in cooperation with other companies and research institutes. The DFKI has a total of seven Living Labs for different fields of application.

Contact: Dr. Serge Autexier Serge.Autexier@dfki.de
Details: www.innolab-livinglabs.de
Photo: University of Bremen Lisa Jungmann

International Conference on Dynamics in Logistics (LDIC 2018)

From 20th to 22nd of February 2018, the sixth International Conference on Dynamics in Logistics took place in Bremen (LDIC 2018). The organizers were the Bremen Research Cluster for Dynamics in Logistics (Log*Dynamics*) and the Bremer Institut für Produktion unjd Logistik GmbH (BIBA) in whose premises the conference was housed. Conference leaders Prof. Michael Freitag, Prof. Herbert Kotzab and Prof. Jürgen Pannek were pleased to welcome 104 participants from 13 countries in Bremen.

The diverse program of the LDIC 2018 included 57 scientific lectures and three key note speeches, which impressively documented the wide content and methodological spectrum of current logistics research and practice. Likewise, the participants could participate in an extremely attractive additional program, which are Internet of Things workshop and visits and guided tours at the Bremen Ambient Assistant Living Lab (BAALL), Robot Soccer Team (B-Human) and the German Research Center for Artificial Intelligence GmbH (DFKI).

The lectures and the subsequent exchange of ideas between the scientists took place at a very high level and testified to the high quality of the contributions and presentations. In contrast to past events, the LDIC 2018 relied on a new short-paper concept, which the participants received very positively. As in previous years, the organizers were able to reward the best entries with a Best Paper Award and three Commended Awards. Following the conference, the organizers have succeeded in publishing special volumes in two scientific journals.

All contributions of the LDIC 2018 are summarized in a **conference proceedings**, which has already been published by Springer under the series Lecture Notes in Logistics www.springer.com/de/book/9783319742243

Contact: Prof. Dr.-Ing. Michael Freitag, Prof. Dr. Herbert Kotzab, Prof. Dr. Jürgen Pannek info@ldic-conference.org
Details: www.ldic-conference.org
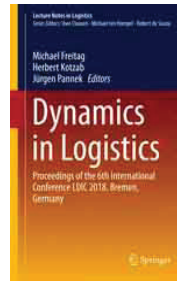Photo: ake1150/Fotolia

Dynamics in Logistics - Proceedings of the 6th International Conference LDIC 2018

The proceedings for the sixth International Conference on Dynamics in Logistics (LDIC 2018) are now available from Springer Verlag. The biennial conference focuses on the identification, analysis and description of dynamics in logistical processes and networks and builds a bridge between theory and application. Due to the growing dynamics, the challenge for today's logistics is to react quickly and flexibly to the constantly changing conditions and requirements. The conference proceedings provide answers on which technologies and methods can be used to meet these challenges. Particular attention will be given to supply chain management and coordination, as well as new technologies such as Cyber Physical Systems and the Internet of Things. The publishers of the conference proceedings are Prof. Michael Freitag, Prof. Herbert Kotzab and Prof. Jürgen Pannek.

Details: www.springer.com/de/book/9783319742243
Contact: Prof. Dr. Jürgen Pannek pan@biba.uni-bremen.de

Special Issue in the International Journal of Logistics: Research and Applications

In the aftermath of the 6th International Conference on Dynamics in Logistics (LDIC 2018), the Log*Dynamics* Research Cluster organizes a special issue in the "International Journal on Logistics: Research and Applications". In accordance with the topic "Integration of Dynamics in Production Systems and Supply Chains", the authors of six distinct conference papers of LDIC 2018 have been invited to extend their work and contribute on the special issue.
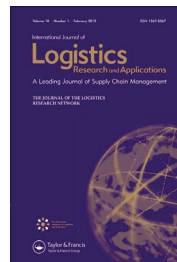
Editors: Ping Liu, Prof. Dr.-Ing. Michael Freitag, Prof. Dr. Jürgen Pannek
Contact: Ping Liu liu@biba.uni-bremen.de

Special Issue in Logistics Research

The Research Cluster for Dynamics in Logistics is launching a special issue on „Dynamics in Maritime and Transport Logistics" in the open access journal Logistics Research. Topics of interest include, but are not limited to:

Maritime Logistics
• Port and Hinterland Operations
• Coordination and Scheduling
• E-ports and Port Security
• Connectivity in Multi-modal Transportation
• Demand Chain Management and Crowd Logistics

Transport Logistics
• Routing and Capacity Utilization
• Intra-logistics Systems
• Shared Resources and Sustainability
• Distributed Planning and Control

• Internet of Things and Web-based Services
Authors are requested to contact the guest editors before submitting their manuscripts to ensure that their articles are included in the special issue and to guarantee a quick review process.

Deadline for submission is **31st of July 2018**.

Guest Editor: Marcella Bernardo, Prof. Dr. Hans-Dietrich Haasis, Prof. Dr. Jürgen Pannek
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Universität Bremen*

*EXCELLENT.