

LogDynamics Newsletter September 2020

Projects

Artificial Intelligence Supports Planning and Control of Car Handling at Ports

The services provided at car ports span virtually the entire spectrum of vehicle logistics, from handling and storage to technical services. The terminal's operations are highly complex and extremely dynamic, presenting major challenges with regard to process planning and control – the subject under investigation in the Isabella research project, which recently came to an end. With Isabella 2.0, the partners BIBA - Bremer Institut für Produktion und Logistik GmbH, BLG LOGISTICS and 28Apps Software continue their successful cooperation in another project supported by the IHATEC program.



In the predecessor project Isabella, a control system for logistics processing at sea and inland ports for the circulation of vehicles was developed and prototypically evaluated at the BLG car compound in Bremerhaven. The control algorithm allocates transport orders to the driving personnel and coordinates the resulting transport needs of the driving personnel by shuttle buses. The assignment of orders is based on the current location of vehicles and drivers and is transmitted via a mobile app. The algorithm calculates a time-optimized route for the shuttle buses and determines stopping points for picking up or dropping off the drivers. Feedback on completed orders is automatically provided via the app so that the control algorithm always has an up-to-date picture of the compound situation.

After the predecessor project Isabella only considered compound -internal transshipments, the research project Isabella 2.0 also takes processes for loading and unloading of external modes of transport (ship, train and truck) into account. For this purpose, it is necessary to ensure app-based communication between driving personnel and control algorithm in ships and trains, where wireless communication is only possible under difficult conditions. For this purpose, a concept based on ad-hoc and mesh networks in combination with suitable radio standards such as WLAN, Bluetooth or LoRa will be developed. A further task is the extension of the control algorithm using methods of sensitivity analysis and artificial intelligence. The aim is to extend the control algorithm with regard to multi-criteria optimization so that the optimization performance can be further improved by situation-specific parameterization, taking into account the prevailing situation (compound filling level, vehicle mix, personnel availability, etc.). In addition, a virtual training application will be developed that facilitates the changeover for the employees.

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Photo: BLG LOGISTICS

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Courage to Take Risks: Millions Granted Once More for Researcher

This funding enables an immense amount of freedom so that innovative, scientific work can be carried out: The German Research Foundation (DFG) has granted Professor Rolf Drechsler a Reinhart Koselleck Project once more. The funding amount, which is spread over five years, exceeds 1.5 million euros.



What is the project about? “The digital revolution has dramatically changed our lives. “After computers, the internet, and modern mobile devices it is now digitalization that is moving into many tradition industries,” says Drechsler. The foundation of this revolution is formed by so-called digital logic circuits. These are small construction elements that make electronic data processing possible in the first place. In order for said elements to be able to fulfil their tasks, the circuits of digital devices have to work perfectly.

Reinhart Koselleck Projects stand for more freedom in order to promote innovative projects that carry a certain positive risk. The researchers should therefore have the courage to take risks. The DFG only grants projects to researchers who can prove their special achievements in their scientific field. The program is named after Reinhart Koselleck, who passed away in 2006 and was one of the most significant German historians of the 20th century. He is seen as one of the founders of contemporary social history in Germany and was regarded as a lateral thinker.

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Research for Green and Intelligent Inland Navigation

Exploiting inland waterway transportation (IWT) is an essential ingredient to reach the European Commissions' ambitious target for reducing greenhouse gas emissions from transportation in the upcoming decades. Over the next 36 months, the research project IW-NET will support the EC's strategic efforts by enabling and providing innovation for the IWT landscape. As coordinator, ISL will lead the activities within the EU research action.



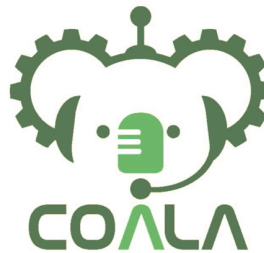
The consortium of 26 companies, research institutions and public organizations from Austria, Belgium, France, Germany, Greece, Italy, the Netherlands, Romania and Spain has teamed up to develop and prove technological solutions and improvements for inland waterway transport. The vision for the upcoming years is to create an “Innovation-driven Collaborative European Inland Waterways Transport Network” (IW-NET). “In order to sustainably shift more transport to inland waterways, we need to change more than just one parameter”, coordinator Nils Meyer-Larsen from the Institute of Shipping Economics and Logistics (ISL) in Bremen and Bremerhaven explains. “Therefore, we will follow a holistic approach which not only covers digitalization and multimodal integration in inland waterway transportation but provides solutions for improved infrastructure management as well as for the next generation of vessels.”

The heart of the project is the IW-NET Living Lab that will serve as a test bed for the technological approaches and solutions. Different application scenarios will comprise a diverse set of experiments along representative corridors and will thereby create valuable insights on how to develop the future of European inland waterway transport. The German scenario will be represented by ISL, Alberding GmbH, bremenports GmbH & Co. KG and the German Aerospace Center (DLR).

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Photo: ISL

AI System to Train New Employees

Humans are at the center of knowledge-intensive manufacturing processes. They must be skilled and flexible to meet the requirements of their work environment. The training of new workers in these processes is time consuming and costly for companies. Many industries suffer from the shortage of skilled workers caused, e.g. by the demographic change. A second challenge for the manufacturing sector is the continuous competition through high quality products. The new project COALA, which is funded by the EU, will address both challenges through the innovative design and development of a voice-first Digital Intelligent Assistant for the manufacturing sector. The COALA solution will base on the privacy-focused open assistant Mycroft. It integrates prescriptive quality analytics, an AI system to support on-the-job training of new workers, and a novel explanation engine - the WHY engine. COALA will address AI ethics during design, deployment, and use of the new solution. Critical components for the adoption of the solution are a new didactic concept to reach workers about opportunities, challenges, and risks in human-AI collaboration, and a concurrent change management process. Three use cases (textile, white goods, liquid packaging) will evaluate the results in common manufacturing processes with significant economic relevance. We expect to reduce the failure cost in manufacturing by 30-60% with the prescriptive quality analytics feature and the assisted worker training. For the change over time, we expect a reduction of 15% to 30% by shortening the worker training time. The three-year project COALA is coordinated by BIBA - Bremer Institut für Produktion und Logistik and funded with 5.7 million Euros by the EU under the "Horizon 2020" program.



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„Machine ECG“ to Protect the Environment

Too often, the maximum possible useful life of components in technical systems cannot be used comprehensively. For this reason, the Institute for Integrated Product Development (BIK) at the Department of Production Technology at the University of Bremen is developing a system together with partners from the industry that will make this possible in the future. „LongLife“ is the name of the research project, and „Machine ECG“ is what the consortium calls its development.



The full title of the research project is „New business models for the further use of technical systems based on a simple, decentralised determination of condition and prediction of remaining useful life“. Besides BIK as research

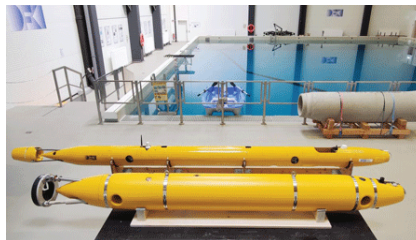
partner and consortium leader, five companies are involved as development and application partners: Aimpulse Intelligent Systems (Bremen), a spin-off from the University of Bremen, CoSynth (Oldenburg), specialist for embedded systems, DESMA Schuhmaschinen (Achim), manufacturer of production systems for shoe manufacturers, encoway (Bremen) from the Lenze Group with its digital innovation laboratory DOCK ONE and as an associated partner EFAFLEX Tor- und Sicherheitssysteme (Bruckberg).

The three-year project has a total volume of around 1.7 million euros and is funded by the Federal Ministry of Education and Research (BMBF) within the framework of the BMBF measure „Resource-efficient recycling management - Innovative product cycles“ (ReziProK) with 1.24 million euros. The project is supported by the Project Management Organisation Jülich (PtJ), Forschungszentrum Jülich.

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Photo: Thorsten Tietjen/BIK

Underwater Robot for Field Trials in Space Research

Could Jupiter's moon Europa offer the right conditions for extraterrestrial life? How could the ocean, which is suspected under the sheet of several kilometers of ice, be investigated? In the Europa Explorer project series, the German Research Center for Artificial Intelligence (DFKI) is developing underwater robots



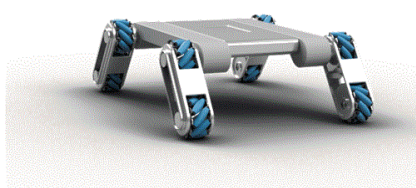
that can autonomously conduct research under ice. With the third project section on the long-term under-ice navigation, the last preparations for the field trials in Scandinavia are underway. The German Ministry for Economic Affairs and Energy (BMWi) funds the development and field trials of the robot DeepLeng with roughly 877,000 euro.

In an ocean covered by an up to 15 kilometer thick sheet of ice that is located on Europa, one of the moons of Jupiter, in an average distance of 600 million kilometers – this is where it could be found: Extraterrestrial life. The warmth and minerals of the hydrothermal vents, which are suspected to exist on the ice moon, offer a potential habitat for organisms. But how could this place be investigated? As part of the Explorer-Initiative of the German Aerospace Center (DLR), the Robotics Innovation Center in Bremen has developed fully autonomous underwater robots that can navigate and conduct research below a sheet of ice.

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Foto: DFKI GmbH, Philipp Kloss

Open IoT Platform Enables Simulation and fast Implementation

Due to a lack of skilled workers and external cost pressure, small and medium-sized production companies are also forced to optimize and automate processes. A great potential lies in logistic processes, which often take place manually and thus require productive working time of skilled personnel. For small and medium-sized companies, however, the initial investment for automated processes represents a major hurdle.



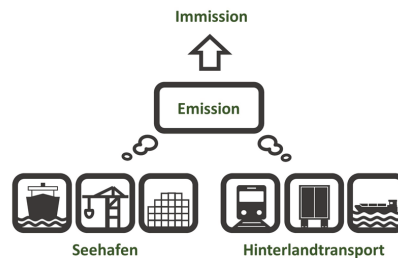
The project MARGO, in which BIBA - Bremer Institut für Produktion und Logistik GmbH participates, aims to use OPIL, an open platform for the integration of logistics processes, to demonstrate the optimization potential of internal logistics processes in a simple and fast way by means of simulations and to prove the feasibility by means of a pilot test. Thus the risk of an investment is reduced to a minimum and the complete integration can be planned more easily. For the identification of optimizations, the production environment of a ring gear manufacturer is mapped in a 3D simulation environment, which is part of OPIL. In this way, different application scenarios of automated guided vehicles (AGV) can be evaluated and compared quickly and cost-effectively.

A prototype AGV will be integrated into the cloud based IoT platform. This allows existing processes to be combined with new material handling processes. After integration, the AGV will be controlled directly via OPIL based on the simulation results. The integration of the AGV into OPIL and the adaptation of the vehicle control system will be carried out in a laboratory test. Subsequently, the simulation results are verified with the AGV in a field test.

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Emission and Concentration Modelling in Maritime Transport Chains

The port industry is an important economic driver in port cities. At the same time, port activities and the associated shipping and hinterland traffic also generate emissions of climate gases and of air pollutants that disperse throughout the city area. This is the focus of the new research project „Emission and Concentration Modelling in Maritime Transport Chains (MaritlEm)“, which started on June 1, 2020, with a term of three years. It is funded by the Federal Ministry of Transport and Digital Infrastructure with a total amount of almost one million euros within the framework of the Modernity Fund („mFUND“) funding scheme.



In this project, port-related traffic movements in Bremerhaven and Bremen will be analyzed in order to determine the emissions caused by these movements. On this basis, pollutant dispersion in the urban area will then be modelled in order to quantify the contribution of port-related emissions to air pollution with spatial differentiation. The aim of the project is to use scenario calculations to derive measures that reduce the pollution caused by port-related activities in Bremerhaven and Bremen. The project is carried out jointly by the Institute of Shipping Economics and Logistics (ISL), Bremen, and IVU Umwelt, Freiburg. The port company bremenports supports the project as an application partner.

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Photo: ISL

Protection Against Safety Loopholes in Smart Home Systems to Become Easier

A team led by the University of Bremen is developing new solutions to close the safety loopholes in smart home systems. The project is to create new ways for the usage of digital technologies to harmonize with the demand for data protection and privacy.



Smart home applications are becoming

increasingly popular on the market: The statistics platform Statista estimates that the revenue in Germany for this year alone will be around 4 billion euros – and that is despite the corona crisis. It is thought that the revenue will total 6 billion euros in three years. Users of connected devices for the automatization of homes are, however, often not aware of the risks that they are taking in terms of data protection and information security. It is frequently the case that they accept said risks as the security settings of their device are too complicated. The Center for Computing Technologies (TZI) at the University of Bremen is carrying out research into and developing new, simple-to-understand, and easy-to-use data protection solutions together with three partners.

The aims of the UsableSec@Home project are the research into and application of psychological learning and decision-making principles to improve the design of smart home systems. Users will be enabled to behave in a safer manner and founded knowledge of technology is not required for this.

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Research for Secure Electronics

Electronic components are part of our everyday life. They are used in autonomous vehicles, mobile phones or service robots and must function safely and reliably. To ensure this, the Federal Government is funding the development of high-tech key technologies. The goal: In the future, the production of electronic components should take place primarily in Germany. The Group of Computer Architecture (AGRA) at the University of Bremen is involved in one of the first projects. It is taking over the function of the TÜV, so to speak.



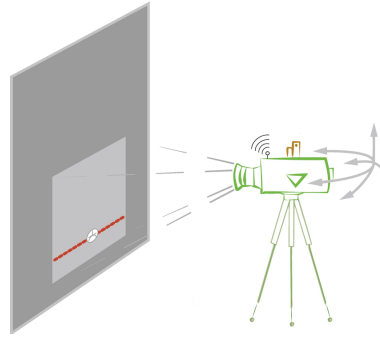
Drechsler's working group is responsible for the quality assurance in the project. The group is developing methods for testing and verification of the development platform so that the analysis and further processing of the data from electronic devices can be carried out without any errors. The fact that the working group has this particular task is down to their competence in this field. The researchers from the University of Bremen are the worldwide leaders on this specialist topic. The Bremen scientists will be using previous research completed on RISC-V by working group members Dr. Daniel Große and Dr. Vladimir Herdt. Said work was accepted well by the expert community and has led to more than ten publications in the past two years – some of which were at the top conferences for system design, such as the Design Automation Conference (DAC) and Design Automation and test in Europe (DATE).

The Scale4Edge project is being funded with roughly 16 million euros over three years by the Federal Ministry of Education and Research (BMBF) as part of the "Flagship Initiative for Secure Electronics" (Leitinitiative für sichere Elektronik). The Computer Architecture working group at the University of Bremen will receive around one million euros.

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Photo: ipopba - stock.adobe.com

BIM-based Assistance System for Laying Electrical Cables by Means of True-to-scale Projection of Circuit Diagrams

As part of this project, an assistance system is being developed that supports continuous digitalization of the electrical installation using augmented projection. The assistance system is a mobile stand solution with a motorized turntable for the projection unit, which projects planning information in the correct scaling, position and orientation on the wall / ceiling / floor. This allows an overall impression to be created and markings and symbols to be transferred manually. For this purpose, the system is equipped with a 2D / 3D scan component to localize its own position as well as corresponding image-based object recognition for real and symbolic light switches, windows, doors, sockets etc. according to DIN standard 15015-2. This allows planning deviations to be recorded and the correct execution of the planning content to be checked. An essential aspect is the development of a CAD engine for the correct perspective and true-to-scale representation. The entire system is optimized for use on construction sites and is accordingly protected against dust and splash water. WireWizard, in which BIBA - Bremer Institut für Produktion und Logistik GmbH is involved as a partner, is funded by the BMWi within the ZIM project.



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Future Mobility - Lowering Inner City Emissions within Bremerhaven by Improving the Truck Navigation in the Hinterland

The Metropolregion Nordwest advertised a two-stage competition procedure on the subject of "Mobility of the Future" for project funding in 2021. The first stage of this procurement was an ideas competition. The VESUV project, in which ISL is involved, was selected by the Northwest Model Region as one of six projects to apply for funding from the Bremen and Lower Saxony promotional funds for the Northwest Metropolitan Region. The project aims to reduce the environmental impact in the Bremerhaven urban area caused by truck search traffic to the port areas. Using a system for numbering port areas and other commercial areas (number ranges), e.g. Grauwalling, industrial area Luneort, each company can be addressed with a number code. Appropriate traffic control measures (fixed signs, signposts, road markings, app) guide incoming truck drivers to their destination on predefined routes without placing unnecessary strain on the urban area.



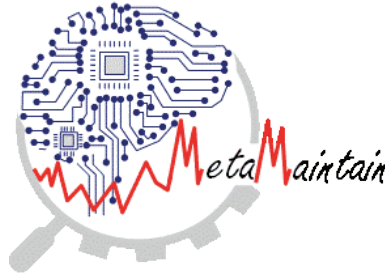
As part of the project, solutions are to be developed for the following three scenarios: assignment of the current berths to access roads; Dynamic route guidance, depending on the lock and swing bridge status; Integration of access information from the terminals. When implementing these scenarios, it is important to find a concept and procedure so that search traffic and the associated emissions in the urban area of Bremerhaven are avoided. In addition to this social component, business considerations regarding resource efficiency, e.g. on saving effects by avoiding unproductive journey km (route and route optimization) will be analyzed. The VESUV approach is to be sustainable, feasible, practical and transferable to other port locations in the metropolitan

region.

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Photo: ISL

A meta-learning Approach to Select appropriate Prognostic Methods for the Predictive Maintenance of Digital Manufacturing Systems

An important task of maintenance is to ensure the technical availability of machines and plants as cost efficient as possible. Predictive maintenance approaches pursue this objective by predicting potential failures of technical components and avoiding them by taking appropriate measures in advance. The forecast models used for this purpose are usually developed for a specific application and cannot be generalized.



The objective the project is to develop a meta-learning system that allows an automated selection of the best suitable forecasting method. The results of the forecasts will eventually be used for an integrated production and maintenance planning. In addition, a monitoring and adaptation procedure is to be implemented to trigger a dynamic adaptation of the system to new system states. In this way, forecasting methods can be selected dynamically and optimal maintenance decisions can be derived based on the current state of a production system.

The first step is to define relevant use cases for the predictive maintenance of production systems. On this basis, a framework will be developed that includes a set of forecasting methods, a methodology for integrated production and maintenance planning, and an ontology for translating information from different data sources. On this basis, the metalearning system will be designed. For this purpose, the framework will be combined with a machine learning technique for selecting and configuring forecast methods, with a simulation model and a service-oriented architecture for data acquisition and data transfer. This will be followed by the addition of a monitoring and adjustment procedure. Finally, the performance of the system is evaluated with regard to forecast errors and key production logistics figures within simulations of real industrial applications. BIBA - Bremer Institut für Produktion und Logistik GmbH is one of the partners of this project and it is funded by the DFG.

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Development of an AR Framework with extended Sensor Technology to Support Training and Education in the Aviation Industry

The complexity of the tasks of technical professions in the aviation industry is high. Research is therefore being conducted into new approaches to knowledge transfer for both training and continuing education. The QualifyAR research project in which BIBA - Bremer Institut für Produktion und Logistik GmbH is involved aims to support the training of apprentices in aircraft construction. Especially in aircraft construction, the highest demands are placed on training.



Accordingly, the use of digital and individual learning environments is being pursued with emphasis in order to improve learning success on the one hand and to prepare the later use of digital assistance systems in the productive process on the other. The QualifyAR project is dedicated to the development of an AR-based qualification system with integrated process step recognition and automated quality control. By means of an AR-framework and on the basis of predefined process databases, teachers should be able to digitally map even complex teaching tasks and to tailor them, taking into account the individual technologie-portfolio. Information and insights of the system are transmitted to the student via a human-system interface using AR-projection in a context-sensitive way. In this project BIBA is researching image-based process step recognition and the use of an IoT construction kit with a focus on signal processing, in order to be able to assess the quality of the task execution on the basis of 2D/3D image data as well as 1D process data, such as torques of cordless screwdrivers, by means of artificial intelligence. The project is realized together with our project partner Ubimax GmbH. The project is funded by the BMWi.

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Knowledge and Technology Transfer through Patents and Standards

With almost 400 patents of relevance to the world market per million inhabitants, Germany is almost on a par with Japan, according to reports by the BMBF (data and facts on the German research and innovation system) and has almost twice as much patent intensity as the USA. BIBA - Bremer Institut für Produktion und Logistik GmbH also fits into this strategic



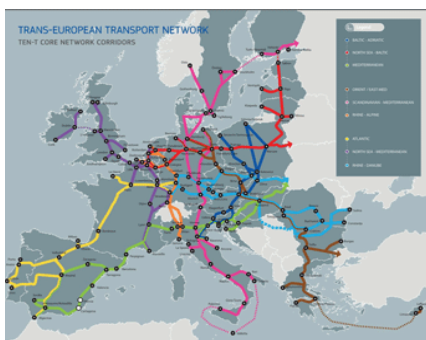
interest in the regional context. The exploitation of scientific findings in terms of intellectual property rights is important for BIBA in terms of the Employee Invention Act. The cooperation with InnoWi, the patent exploitation agency of the state, will be continued in 2020 within the framework of the BMWi third-party funded project WIPANO „Knowledge and Technology Transfer through Patents and Standards“. It promotes public research and companies in the patenting and exploitation of their ideas and supports innovative projects for standardization. The project is funded by the BMWi.

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ISL Contributes to Completion of Detailed Implementation Plan for Motorways of the Sea (MoS) Program

The ‚Motorways of the Sea‘ program aims at improving short-sea connections and seaports towards a modal shift for an increased share of maritime transport around Europe. By supporting the European Green Deal one fundamental goal is to enhance environmental performance of short sea shipping and ports by e.g. reducing air and noise emissions from ship and port operations. The Detailed Implementation Plan (DIP) provides the framework until 2027



for the further development of the ‚Motorways of the Sea‘ program and the associated integration of seaports into the nine TEN-T core corridors. The plan

was developed jointly by ISL, Kurt Bodewig, DG Move, MoS-Coodinator, and its partners Circle (I) and ADS (B) and supported by EU Member States and actors from the port and shipping sector.

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Details: www.onthemosway.eu, www.youtube.com/watch?v=ooN2vLj72s&,
www.circletouch.eu/en

Photo: ISL

Close-to-Body Sensor System for Collaboration in Robot Farms

So far, security research and technology development has focused almost exclusively on human collaboration with a single robot. However, in industry several robots are increasingly working together directly for single process steps and share workspace. The Corofa project aims to develop a procedure for the introduction and design of safe human-robot collaborations in multi-robot assembly systems. This will create working environments in which humans and several robots share workspace and work together simultaneously. For safe collaboration, a close-to-body sensor system will be developed in addition to the procedure with which persons in the workspace can be detected, identified and localised and their behaviour/intentions can be recognised. It shall be made possible by intelligent data analysis with process mining algorithms. The COVR toolkit and the protocols will be integrated into the procedure and verified/validated by a comparison with the results of the process mining. This project is funded by the COVR Award, BIBA - Bremer Institut für Produktion und Logistik GmbH is one of the partners.



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Closed-loop Digital Pipeline for a Flexible and Modular Manufacturing of Large Components

The manufacturing of large-scale parts needs the implementation of holistic data management and integrated automation methodology to achieve the desired levels of precision using modular and more flexible equipment. Large-part manufacturing is characterised by a high level of required customisation (built-customer specific). Furthermore, the manufacturing of complex and large-scale parts involves a variety of subassemblies that must be manufactured and assembled first.



This high degree of personalisation implies a great effort in the design and the posterior verification after manufacturing, to achieve high precision. Nevertheless, this customised product-centric design requires an optimisation of the resources of the workshop (i.e. workers, machines, devices) for a responsive, reconfigurable and modular production. In addition, there is the worker-centric approach: performing key labour-intensive tasks while maintaining the industry-specific knowledge and skills of the workers.

The project PENELOPE in which BIBA - Bremer Institut für Produktion und Logistik GmbH is involved proposes a novel methodology linking product-centric data management and production planning and scheduling in a closed-loop digital pipeline for ensuring accurate and precise manufacturability from the initial product design. PENELOPE is built over five pillars for developing a common methodology and vision deployed in four industrial-driven pilot lines in strategic manufacturing sectors: Oil&Gas, Shipbuilding, Aeronautics and

Bus&Coach; with potential replicability to further industrial sectors. Moreover, it will be set up a pan-European network of Didactic Factories and showrooms, providing training and upskilling capabilities enabling the workforce transition towards Industry 4.0 and multi-purpose testbeds, for assisting the dedicated industry adaption. PENELOPE envisions to highly-increase EU manufacturing sector competitiveness by increasing production performance, quality and accuracy while ensuring workers' safety and resource efficiency. It is funded by the Horizon 2020 program.

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Completed Project LoRaLight - Wireless Pick-by-Light/ Put-to-Light Order Picking System

In the LoRaLight project, a wireless Pick-by-Light/ Put-to-Light order picking system was developed, which uses the network protocol Long Range Wide Area Network (LoRaWAN). This system is suitable for use in environments with high metal content, such as picking warehouses and is characterised by the fact that very few gateways are sufficient for a large number of integrated devices.



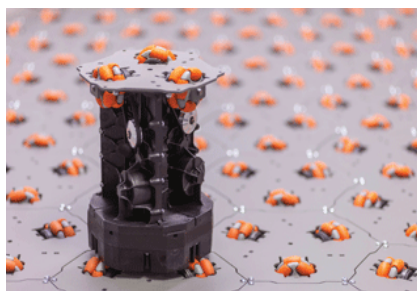
The goal of the partial work of BIBA - Bremer Institut für Produktion und Logistik GmbH was to work out possibilities for error reduction in pick orders and goods compilations, which could be achieved by the two primary focuses access/storage recognition and object identification. In order to be able to ensure that the goods are picked from the correct shelf compartments, BIBA has developed an access detection system using PIR sensors. This system was also mirrored on the picking trolley, where the correct placement in the specified trays is checked. As different products may be stored in one shelf compartment, an object identification was implemented in addition to the access detection, in which the video stream of a standard webcam is evaluated concerning colours and alphanumeric characters through machine learning methods. Since the LPWAN network protocol is not suitable for the transmission of large amounts of data, the system was implemented as a mobile solution, using NVIDIA Jetson AGX or Nano that provide the required computing capacity and are operated in an energy-saving manner.

WSN from Braunschweig implemented the integration of all shelf and picking cart modules as well as the object identification unit into the overall system. That included the control of pick-by-light/put-to-light components as well as corresponding interfaces to warehouse management systems so that the digital picklists are available decentrally on the picking trolleys so that the alignment can be performed correctly.

Contact: Markus Trapp tap@biba.uni-bremen.de

EU Funding for BIBA Spin-off cellumation GmbH

The European Innovation Council (EIC) supports the BIBA spin-off cellumation GmbH in the further development of its highly innovative cellular conveyor technology. The corresponding allocation notice for EU funding recognises cellumation as one of the most innovative start-ups in Europe. From more than 2,000 applicants from 40 countries, this year, the EIC selected almost 50 young companies and their innovations as worthy of support - among them cellumation GmbH with its cellularly designed support and positioning system „celluveyor“. With



this support, more than two million euros will run from Brussels to the Bremen start-up. The EU is using the money to finance the further development of an innovative conveyor technology component for „flexible material flow in intelligent warehouses and smart production centres“, according to justification.

Contact: Dr.-Ing. Hendrik Thamer info@cellumation.com
Details: www.cellumation.com
Photo: cellumation GmbH

Internationalization

New Erasmus+ Exchange Projects with Asia

At the turn of the year, the International Graduate School for Dynamics in Logistics (IGS) participated again very successfully in several applications in the EU's Erasmus+ program for international exchange with third countries. The exchange of scientists is very important for LogDynamics and the internationalization strategy of the University of Bremen.



During a private stay in Sri Lanka, Prof. Dr. Walter Lang, IMSAS, visited the University of Peradeniya and a former guest researcher at IGS, Prof. Dr. Asela Kulatunga. Prof Lang's lecture entitled „Intelligent Container - A Sensor Network for Transport Management“ was met with great interest, as did his presentation of the study opportunities at the University of Bremen.

This visit at the beginning of February was a great luck for LogDynamics, because the personal contact could be deepened once again before the travel restrictions. Together with the profitable mobilities in the framework of the previous Erasmus Mundus projects, it will be a very valuable support for the implementation of the next EU-funded exchange projects: two Erasmus+ International Credit Mobility (ICM) projects and one Erasmus+ Capacity Building in Higher Education (CBHE) project with a duration of three years each.

At the moment it is still uncertain how the planned mobilities can be implemented under the current conditions. But there is a well-founded hope that we might be able to meet again in person next year. The Erasmus+ ICM program provides funding for exchanges with Chiang Mai University, Thailand, and with three universities in Sri Lanka. The CBHE project is coordinated by the Capital University of Science and Technology, Islamabad, Pakistan. Asian partners include two universities from Bhutan and the Maldives, in addition to other universities in Sri Lanka and Pakistan. The only other European partner involved in the CBHE will be the Universidade de Évora, Portugal. It will start in January 2021. The cooperation of the majority of the partners in these projects has already been tested in the past, so that success under difficult conditions is very likely.

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Events

Agile Collaboration

Date: **September 25, 2020**
Venue: Online

The path to agile cooperation leads over cultural hills and through puddles of technology. In this workshop we want to shed light on how companies can manage the change in culture and the flood of supposedly useful tools. Collaboration tools and methods (such as working out loud) can be used sensibly,

but require the participation and willingness of those involved. In that sense, it is also about organization and culture. Therefore, the workshop is divided into two parts: Change-culture for agile collaboration and appropriate methods and tools.



The online seminar is part of the series „Designing the Digital Change“, which is offered in cooperation with BIBA - Bremer Institut für Produktion und Logistik GmbH and Mittelstand 4.0-Kompetenzzentrum Bremen.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de
Details: www.kompetenzzentrum-bremen.digital/events/agiles-zusammenarbeiten (German)
Photo: Tine Casper

BIBA at the International Supply Chain Conference

Date: **October 21 - 23, 2020**
Location: Berlin

The International Supply Chain Conference is one of the most important events on logistics and supply chain management in Europe and is held in Berlin, also during the Corona period as a presence event. BIBA - Bremer Institut für Produktion und Logistik participates with the Mittelstand 4.0-Kompetenzzentrum Bremen in the accompanying trade exhibition. The presence is all about digitalization. A mobile digital assistance system for optimizing logistical processes in production will be demonstrated. The demonstrator shows how sensor technology can be used to track individual production steps in real time, thus ensuring transparency and security. We cordially invite all congress participants to visit us at booth PV/23.



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

Transparent Supply Chains through Digitalization

Date: **October 23, 2020**
Venue: Online

This event is an online workshop. You will learn how to keep track of your supply chain inventory using mobile sensors.



Today's supply chains are global and dynamic, and therefore subject to many disruptions. As a result, it can be difficult to keep track of inventory at each point in the supply chain.

Exemplary, we will show you how you can use a mobile sensor system to keep an overview of your stocks. In this case, transport containers are equipped with mobile sensors at the end of production, which continuously collect location, time and status information on the goods they contain in multi-modal transport chains. Digital services use this information to make stocks transparent, to predict arrival times and delays as well as to warn in case of unfavorable conditions.

Contact: Michael Teucke tck@biba.uni-bremen.de

Details: www.kompetenzzentrum-bremen.digital/events/transparente-supply-chains-dank-digitalisierung-2 (German)

Photo: Sabine Nollmann

Design Thinking

Date: **October 30, 2020**

Venue: Online

Design Thinking is a framework for developing innovative products and solutions and is often mistakenly interpreted as a creativity technique. In this workshop we will clarify what Design Thinking actually is and how it differs from classical product development.



The online seminar is part of the series „Designing the Digital Change“, which is offered in cooperation with BIBA - Bremer Institut für Produktion und Logistik GmbH and Mittelstand 4.0-Kompetenzzentrum Bremen.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de

Registration: www.kompetenzzentrum-bremen.digital/events/design-thinking (German)

5th International Conference on System-Integrated Intelligence - Intelligent, Flexible and Connected Systems in Products and Production (SysInt 2020)

Termin: **November 11 - 13, 2020**

Venue: Online

The International Conference on System-Integrated Intelligence is a cooperative event between the Universities of Bremen, Hanover and Paderborn. The fifth edition has been shifted to November 11 to 13, 2020 and will take place online.

LogDynamics is one of the co-organisers.

SysInt deals with the integration of new intelligent functionalities into materials, components, systems and products. The conference offers a platform for science and industry and focuses on six main topics:



- 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

Contact: Aleksandra Himstedt info@sysint-conference.org

Details: www.sysint-conference.org

Training „Technologies of Logistics“

Date: **November 17, 2020**

Venue: BIBA or online

Within the scope of the training „Technologies of Logistics“ you will learn about the possibilities and potentials of self-control for your company in our practice-oriented learning factory. Here you will actively deal with mobile technologies and products as well as the efficient planning and control of logistics processes and technical systems. Last but not least, we will look at adaptive systems for a changing environment and together we will consider the possibilities that the technologies and solutions presented will also bring for your company.



By participating in the training

- you will be supported in determining the potential for CPS in your company
- get to know precise conditions of use as well as advantages and disadvantages of decentralized and centralized control systems for your logistics tasks
- you will learn basic characteristics of the technologies taught and possibilities for your application
- get to know potentials and limits for the self-control of logistical processes as well as for the merging of material and information flow

Contact: Michael Teucke tck@biba.uni-bremen.de

Details: www.kompetenzzentrum-bremen.digital/events/schulung-technologien-der-logistik-2

(German)

Photo: Jan Meier

Idea Generator - Ideas like on the Assembly Line

Date: **November 27, 2020**

Venue: Online

Are you looking for new approaches and solutions to the problems of your customers? Just turn your problems upside down! How to do that? In this workshop we will present different creativity techniques (e.g. headstand method, 6-3-5, Scamper, Disney) to face problems with new creativity techniques. Use the methods taught in the practice groups in your next meetings to give them more structure and performance.



The online seminar is part of the series „Shaping the Digital Change“, which is offered in cooperation with BIBA - Bremer Institut für Produktion und Logistik GmbH and Mittelstand 4.0-Kompetenzzentrum Bremen.

Contact: Aleksandra Himstedt him@biba.uni-bremen.de

Registration: www.kompetenzzentrum-bremen.digital/events/ideengenerator-ideen-wie-am-fließband (German)

Photo: Tine Casper

12th International Conference on Subject-Oriented Business Process Management (S-BPM ONE 2020)

Date: **December 2 - 4, 2020**

Venue: Online

S-BPM (Subject-Oriented Business Process Management/Business Process Management) as a discipline is characterized by a straightforward approach to the analysis, modeling, implementation, execution and management of interaction patterns with an explicit stakeholder focus. However, S-BPM also encompasses other, still largely undefined topics related to the development and management of systems and organizations, especially in the areas of interaction culture, process-aware information systems, strategic orientation and governance structures. The S-BPM ONE conferences are a perfect forum to exchange and discuss results and experiences of these activities. The 12th International S-BPM ONE Conference 2020 will be hosted digitally from December 2 to 4, 2020. It will focus on how companies can help their stakeholders to become more engaged in promoting competitive advantages that are built through or on process technologies.



Contact: Prof. Dr. Hans-Jörg Kreowski kreo@informatik.uni-bremen.de

Details: www.s-bpm-one.org

Workshop-Series: Advanced Training as Scientific Innovation Ambassador

Start: **January 2021**

Venue: Bremen

The target group for this workshop-series are scientists from the state of Bremen with interest in or experience in the logistics industry. The logistics sector - one of the most important driving forces for the economy in Bremen - is characterized by small and medium-sized players. Aligning their organization to innovation presents SMEs with challenges that often cannot be met. Even if potentials are known,



companies are not necessarily able to exploit them on their own. This is where the BreLogIK project (in which ISL and BIBA participate) comes in, with the aim of exploiting previously unused opportunities in close cooperation between Bremen's science and logistics industry. For this reason, the BreLogIK project partners offer scientists in the state of Bremen further training to become scientific innovation ambassadors for the Bremen logistics industry:

- Take part in a series of workshops and benefit from the know-how of our teams of experts
- Establish further contacts with Bremen's economy and gain deeper insights into the world of logistics
- After the workshops you can test your new specialist knowledge within the framework of accompanying projects in cooperation with Bremen companies
- Become a scientific innovation ambassador for the logistics industry in the state of Bremen!

Contact: Andrea Voth voth@isl.org

Registration until 30.11.20: info@brelogik.de

Details: www.brelogik.de (German), www.isl.org/en

Photo: andranik123 / adobe.stock.com

Bremen Senatorin for Science and Ports visits the ISL

Dr. Claudia Schilling, the Bremer Senator for Science and Ports, visits the ISL. „The ISL was founded 1954 with the goal to carry out and support scientific research on shipping. With this, it is so to say the interface between my departments main emphasis: research and ports“, states Schilling while visiting the ISL on August 5, 2020, in the Universitätsallee. It was a pleasure for the ISL to have the



Senator visiting the site and to provide insights into innovative international research and industry projects, being worked on in the ISL at the moment. Current research projects include intelligent information systems for optimized and automated processes in inland navigation, digitizing cargo handling and port-hinterland traffic protecting port from cyber-attacks. Within the field of ‚Maritime Environment‘, the ISL develops a strategy to adopt to the changes due to climate change and keeps competences to support the northern German hydrogen strategy. Senator Dr. Schilling has an important role within this strategy for Bremen. Five fields of competences and a tradition of modern research lasting for more than 60 years, made the ISL one of the currently Europe-wide leading institutes for research, consulting and know-how-transfer for maritime logistics. Dr. Schilling was able to get first-hand insights into these broad competences – using an interactive overview of hydrogen technologies on a multi-touch-table and observing an H0-model, explaining processes for autonomous switching and new concepts to regulate truck traffic in seaports.

Contact: Prof. Dr. Burkhard Lemper lemper@isl.org, Prof. Dr. Frank Arendt arendt@isl.org

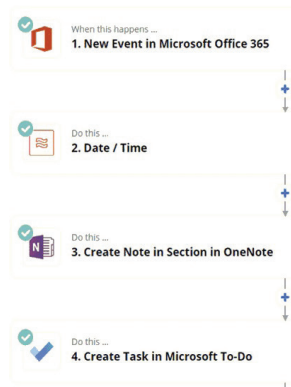
Details: www.isl.org/en

Photo: ISL

Virtual Supply Chain Day: Digital Information Logistics at the Home Office

On April 16 the annual event of the „Supply Chain Day“ took place - even in times of Corona. In previous years we celebrated the day with events and workshops. This year we had to reschedule due to the special circumstances and for the first time took a virtual route. The result was the online workshop „Personal Efficiency and Effectiveness through Digitalization - Digital Information Logistics at the Home Office“, which was attended by more than 50 participants.

In a video presentation, we showed various aspects of self-organization and how to become more efficient and effective by using digital tools, e.g. at the home office. This was followed by practical examples and a discussion. The current topic, but also the possibility of virtual exchange, was well received by the participants. The new online format was also met with a positive response.



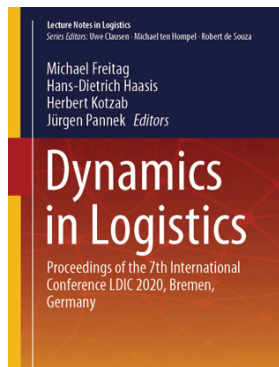
Contact: Aleksandra Himstedt him@biba.uni-bremen.de

Details: www.tag-der-logistik.de

Photo: andranik123 / adobe.stock.com

Dynamics in Logistics - LDIC 2020 Proceedings Published

The proceedings of the seventh International Conference on Dynamics in Logistics (LDIC 2020) are now available at Springer. The conference, which takes place every two years, focuses on the identification, analysis and description of dynamics in logistics processes and networks and builds a bridge between theory and application. Due to the growing dynamics, the challenge for today's logistics is to be able to react quickly and flexibly to the constantly changing conditions and requirements. The conference proceedings offer answers to these challenges and show which technologies and methods can be used to meet them. Special attention is paid to the modeling, planning and control of processes, supply chain management, maritime logistics as well as innovative technologies and robot applications for cyber-physical production and logistics systems. Editors of the conference proceedings are Prof. Michael Freitag, Prof. Hans-Dietrich Haasis, Prof. Herbert Kotzab and Dr. Jürgen Pannek.



Contact: Prof. Dr.-Ing. Michael Freitag, Prof. Dr. Dr. h.c. Hans-Dietrich Haasis, Prof. Dr. Herbert Kotzab info@ldic-conference.org
Link to proceedings: www.springer.com/gp/book/9783030447823, www.ldic-conference.org

An Unstructured Big Data Approach for Country Logistics Performance Assessment in Global Supply Chains

Prof. Dr. Aseem Kinra (Professorship of Global Supply Chain Management), in collaboration with colleagues from the Copenhagen Business School (Prof. Kim Hald and Raghava Mukkamala) and Ryerson University (Prof. Ravi Vatrpu), has published a new article on the measurement of country logistics performance in the International Journal of Operations and Production Management.



In this paper, the authors lay the design of a novel textual analytics approach that is based upon unstructured big data. Not only does the developed approach generate results in the form of logistics performance assessments, but it also contributes towards the development of more informed weights of different logistics performance categories that are missing in the existing approaches. Moreover, the approach tackles the benchmarking task with reasonable accuracy and generates useful assessments from a managerial and policy-making perspective.

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Link to article: www.doi.org/10.1108/IJOPM-07-2019-0544
Photo: Emerald

Examining the Potential of Textual Big Data Analytics for Public Policy Decision-making: A Case Study with Driverless Cars in Denmark

Prof. Dr. Aseem Kinra (Professorship of Global Supply Chain Management) and Doctoral Candidate Samaneh Beheshti-Kashi (LogDynamics IGS, BIBA)

in collaboration with other International colleagues have published a new study on big data analytics and the adoption of driverless mobility in the Transport Policy journal. The study investigates the potential of AI and machine learning techniques in transport policy decision-making through a real-life case study on policy making within driverless cars.

The research applies automated text and content analytic techniques such as topic modelling, document classification and sentiment analysis on unstructured data forms like newspaper articles and tweets, and ascertains the main concerns or factors related to the adoption of driverless cars. The results add to the literature and to the Road Directorate's decision-making fundament on the future adoption of driverless car technology by suggesting labour market effects, amongst others, to be a significant concern for the public.

From the study, it can be projected that this form of data science methodology will complement the traditional survey procedures for analysing public opinions in the transportation sector and can be a very useful medium for transportation governing bodies.

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Link to article: www.sciencedirect.com/science/article/abs/pii/S0967070X20303590

Photo: Elsevier

