Log*Dynamics* News

Autonomous Groupage Traffic – from the Research into the Practice

In groupage traffic, several orders with less-than-truckload (LTL) shipments are served by the same truck to decrease total cost. In pickup tours, trucks transport loads from their origin to a local depot where the shipments are consolidated to build economical loads. Through LTL networks the load is transported to a depot in the destination area where each good is delivered to its final destination in onward carriage. The complexity of process planning is even increased by changing amounts and individual qualities of shipments like weight, volume, priority and value. Handling the complexity in real situations is aggregated by the high degree of dynamics that result from unexpected events. The exact amount and properties of shipments are not known in advance. Actual capacities are only revealed while serving tasks. Further, undelivered loads in pre-carriage decrease truck capacities in onward carriage. To react to changing traffic conditions and delays on incoming goods departments, it is essential to adapt tours and timetables while regarding actual capacities.

Autonomous logistic processes enable efficient solutions for complex problems in dynamic environments.The transfer project “Autonomous Groupage Traffic” of SFB 637 and the Bremen office of Hellmann Worldwide Logistics GmbH & Co. KG investigates decentralized, autonomous processes for supporting planning and controlling of logistic companies. The goal is to enhance the dynamic processes with adaptive, reactive system behavior to increase the service quality through short transit times as well as reliable deliveries. In addition, both carriers and dispatchers should be supported with tour and routing proposals.

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BIBA: Visionaries established the Institute 30 Years Ago

The University of Bremen was ten years old and there were still intense debates at the politically moved reform university about the establishment of a faculty Production Engineering. It was just during that time that the Bremen Institute for Production Engineering and Applied Industrial Science (BIBA) was founded – it was the first affiliated institute of the University of Bremen. On the 9th of September 2011 BIBA celebrated its 30th anniversary with the event “Process Innovation through Technology and Organization” with 300 invited guests. Among others former heads of the institute, academic colleagues, and representatives from the industry, society, politics and administration participated in the event.

BIBA owes its existence to dedicated visionaries from science, politics and administration. They had supported the establishment of the faculty of Production Engineering at the University of Bremen and the founding of an affiliated institute. With the collaborative project “Ship of the Future” the new institute officially began its work under the direction of Professor Holger Luczak. For its tenth birthday BIBA received a building. The institute already counted up to 130 employees and further growth emerged. Renowned production engineers had an impact on the institute and essentially contributed to its success.

With the founding of the institute Bremen wanted to bring forward the high-tech location. This concept worked out. Today the BIBA is one of the biggest research institutes in Bremen. The research encompasses the entire supply chain; it is holistic, interdisciplinary and focuses cross-institutional cooperation as well as transfer. This is proven by the numerous collaborative projects – whether with small or medium-sized business or with global players. The institute is rooted locally but acts globally.

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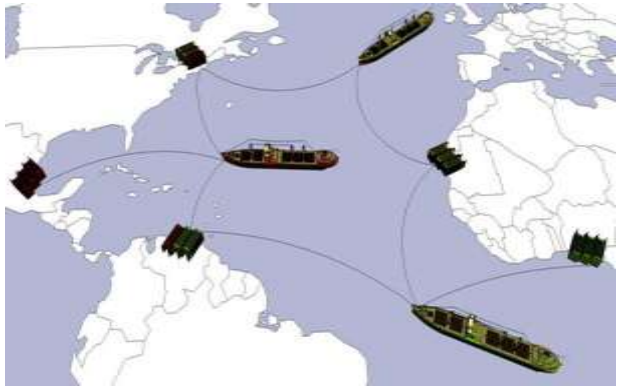
Wind-Powered Accessory Drives for Cargo Ships



In the course of discussions about the rapid climate change and the dwindling fossil fuels, the use of alternative drive systems in maritime logistics becomes relevant again. The efficient use of wind-powered accessory drives (e.g. kite sails) can reduce fuel costs by up to 30%. But the application of alternative drive systems also introduces additional uncertainty that must be taken into account in route- and freight -planning and freight-control to provide a solid basis for robust supply chains.

Funded by the Lower Saxon “Vorab“ of the Volkswagen Foundation, the research centre "ROBUST" of the University of Applied Sciences Emden-Leer in collaboration with the "Bremen Research Cluster for Dynamics in Logistics“ will develop knowledge-based, robust models for planning and control that incorporate wind-powered accessory drives and employ these models with test data from a shipping company (“Briese Schiffahrts GmbH”). The aim of the project is an efficient application of wind-powered accessory drives by taking into account the ecological and economical potentials along the whole supply chain. Since renewable-powered cargo ships exhibit slower and non-uniform driving speeds, the additional requirements for transport goods as well as of pre- and post-carriage will be analyzed. Based on these requirements the potential of wind-powered accessory drives will be evaluated for adequate supply chains. This process involves the prediction and analysis of hinterland traffic dynamics, the evaluation of the ecological impact on multi-modal supply chains and the application of performance measurement models for wind-powered drives. The subsequent route planning will be simulated by software agents and will be performed autonomously by methods of artificial intelligence.

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Special Honor: Bernd Scholz-Reiter now “Fellow” of CIRP

The International Academy for Production Engineering (CIRP) cannot be joined like a club. You will be invited to join the work of this world elite board and at first you are an associate member. This honor is only granted to those who accomplish something remarkable in research and development and have an outstanding reputation. Only after several years of involvement at CIRP and a complex electoral process you can become a complete member (Fellow). Now Prof. Dr.-Ing. Bernd Scholz-Reiter was elected as Fellow for CIRP in Budapest – as the fourth university researcher from Bremen.

Scholz-Reiter is the head of the department Planning and Controlling of production-technical Systems at the faculty of Production Engineering (Mechanical Engineering & Process Engineering) of the University of Bremen. He is the managing director of the Bremer Institut für Produktion und Logistik GmbH (BIBA) at the University of Bremen and the spokesperson of the research grouping LogDynamics. Through the election to become a complete member CIRP now honored his scientific accomplishments.

Now there are four researchers from Bremen in the German delegation which is limited to 20 Fellows: besides Scholz-Reiter Prof. Dr.-Ing. Ekkard Brinksmeier (Manufacturing Process), Prof. Dr.-Ing. Gert Goch (Measurement Engineering, Automation and Science of Quality) and Prof. Dr.-Ing. Frank Vollertsen (Forming and Laser Technology/Wielding Technology and related Processes) work as Fellows in this influential circle of experts. That means the Production Engineers from Bremen are represented above average at CIRP. They all run renowned research institutes and belong to the faculty of Production Engineering.

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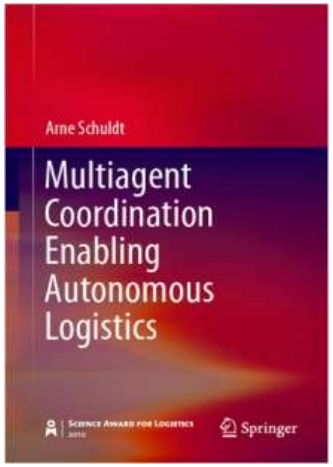
Publication

Multiagent Coordination Enabling Autonomous Logistics



The book describes the implementation of autonomous control with multiagent technology. Therewith, it tackles the challenges of supply network management caused by the complexity, the dynamics, and the distribution of logistics processes. The paradigm of autonomous logistics reduces the computational complexity and copes with the dynamics locally by delegating process control to the participating objects. As an example, shipping containers may themselves plan and schedule their way through logistics networks in accordance with objectives imposed by their owners. The technologies enabling autonomous logistics are thoroughly described and reviewed. The presented solution has been used in a realistic simulation of real-world container logistics processes. The validation shows that autonomous control is feasible and that it outperforms the previous centralised dispatching approach by significantly increasing the resource utilisation efficiency. Moreover, the multiagent system relieves human dispatchers from dealing with standard cases, thus giving them more time to solve exceptional cases appropriately.

The book is based on the PhD thesis by Dr. Arne Schuldt. Advised by Prof. Otthein Herzog, the author conducted his research in the International Graduate School for Dynamics in Logistics and the Collaborative Research Centre on Autonomous Logistics Processes (SFB 637). The thesis has been awarded with the Science Award for Logistics of the German Logistics Association (BVL) in 2010.

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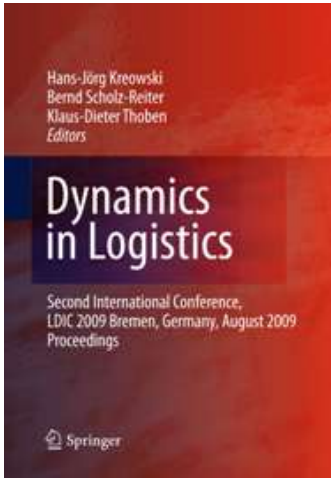
Events

Dynamik in Logistik – from Basic Research to Implementation



The 3rd **International Conference on Dynamics in Logistics** (LDIC 2012) will be held in Bremen (Germany) from 27th of February to 2nd of March 2012. The conference, which was established in 2007 by the Bremen Research Cluster for Dynamics in Logistics (LogDynamics) of the University of Bremen, is concerned with the identification, analysis, and description of the dynamics of logistic processes and networks. The spectrum reaches from the modeling and planning of processes over innovative methods like autonomous control and knowledge management to the new technologies provided by radio frequency identification (RFID), mobile communication, and networking.

Parallel to LDIC 2012, the ImViReLL 2012 – **Conference on Impact of Virtual, Remote and Real Logistics Labs** will be hosted for the first time. The conference addresses lab based logistics research and education, evaluates the significance of the labs for science and analyzes specific needs, possibilities and challenges in the areas of engineering, information technology, distributed education and collaborative research.

LDIC 2012 and ImViReLL 2012 provide a platform for scientific exchange concerning the latest technological developments.

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• LDIC 2012: Prof. Dr. Hans-Jörg Kreowski info@ldic-conference.org

• ImViReLL 2012: Dieter Uckelmann conference@imvirell.org

Further Informations:
• LDIC 2012 – http://ldic-conference.org

• ImViReLL 2012 - http://imvirell.org

Joint Booth at HMI 2012: Logistics Factory – Automation in Logistics

Already this year in May the joint booth “Logistics Factory – Automation in Logistics” proved itself successful at the world’s biggest logistics fair CeMAT. Together with partners from science and industry the researchers of the Bremer Institut für Produktion und Logistik GmbH (BIBA) of the University of Bremen would like to continue this successful work at Hannover Messer from the 23rd until the 27th of April 2012.

At the planned joint booth the logistics chain will be illustrated through agents with their products and ideas. The booth provides an overview over the entire chain as well as an insight in details about this topic. That is why the booth is very well placed at the Hannover Messe 2012 at hall 7 “Industrial Automation” of the international leading trade fair for process automation, manufacturing automation and systems solutions for production and buildings. Among other things the joint booth is to increase the awareness and acceptance of automation solutions for logistics as well as to illustrate the challenges and potentials of automation in logistics. A crucial point is also to promote the dialogue between science and industry.

The concept of the booth plans to interdisciplinarily bring together the different areas of logistics and to show their connections. Typical elements from the logistics process chain are to be presented and functional processes of the material and information flows are to be clarified. The partners will be able to present their projects and products in a process chain, thus providing the fairgoers with a holistic view. If you are interested in joining, please do not hesitate to contact us!

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Further Informations: http://www.fairworldwide.com/de/hm/logistikfabrik.html

Call for Papers

1st Joint Symposium on System Integrated Intelligence: New Challenges for Product and Production Engineering

Date: June 27th – 29th 2012
Location: Hannover, Germany

www.sysint-conference.org

Conference Scope

The Symposium provides a forum for academia and industrialists to disseminate their latest innovations and practises. It focuses on the integration of functions into systems, parts or products which will enable future technologies with enhanced capabilities. The development of new sensor technologies, self-optimizing systems, sensorial materials and self-controlled processes for production or logistic applications within the scope of the Symposium. The conference addresses research in logistics and product engineering from a wide range of fi elds, e.g. computer science and operations research.

Topics of interest include, but are not limited to:

• Methods and Algorithms: Agent-based systems, machine learning and biologically-inspired methods for optimization and planning
• Advanced Applications of Autonomous Objects and Systems
• Self-Optimization and Autonomous Control: Design, reliability, modeling and validation
• Human-Machine-Interaction: Visualization and transparency
• Enabling Technologies: Sensorial materials and systems
• Advanced sensor integration technology
• Systems Engineering
• Advanced sensor integration and embedded systems

Important Dates

December 16th, 2011: Proposals for special sessions, workshops and tutorials
January 31st, 2012: Extended Abstract Submission
March 31st 2012: Notification of Acceptance

May 1st, 2012: Final Program
June 27th - 29th 2012: Conference

Please visit the conference website for submission details and autor information: www.sysint-conference.org/submissions.html

Organisation

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