

PRESS RELEASE

New business models with artificial intelligence Leading-Edge Cluster it's OWL presents new approaches at Hannover Messe

Hannover, 1 April 2019: Networked manufacturing, intelligent products and smart services: In the Leading-Edge Cluster it's OWL, companies and research institutes jointly develop new approaches for small and medium-sized enterprises. More than 50 companies, research institutes and startups are presenting innovative solutions at the OWL joint stand (Hall 16 A04) at Hannover Messe. These include machine learning, platforms, intelligent product development, assistance systems, additive manufacturing and vertical farming.

Prof. Dr. Roman Dumitrescu (Managing Director it's OWL Clustermanagement GmbH) explains: "Machine learning has a big impact on all divisions of the company. In our projects, we develop new technologies in the field of machine learning that can be utilised for the optimisation of production processes and products. Here, we also bear in mind implications and opportunities for business models. At it's OWL, we have the best conditions: our global market leaders in the automation industry are major drivers and we offer proven research expertise in the field of artificial intelligence."

Integrating employee knowledge into machines

Fraunhofer Institute for Mechatronic Systems Design IEM demonstrates how machines and plants are becoming intelligent with the help of machine learning methods. One typical application example is the operational control of a mechanical industrial centrifuge that may be used for the production of apple juice. Here, companies make use of their employees' knowledge and experience to detect deviations from the normal condition. Fraunhofer IEM has developed a digital expert system which will in future support employees with that task. Machine learning methods which assess the correlation between data from explicitly integrated sensors and personalised expert knowledge have been utilised. Production errors can thus be detected as well as prevented without the need for the centrifuge to be monitored continually by employees. Maintenance is facilitated as well.

The Fraunhofer Institute of Optronics, Systems Technologies and Image Exploitation IOSA Industrial Automation Branch (IOSB-INA) and the Institute for Industrial Information Technology (inIT) of Ostwestfalen-Lippe University of Applied Sciences focus on retrofitting. With the help of an almost 30-year-old drill rig, the researchers demonstrate how artificial intelligence can be used for condition monitoring. Data acquisition systems and algorithms can learn the system behaviour and detect and localise anomalies such as faulty user or machine behaviour. The application case shows how existing machines can be connected to the digital world: At the drill, for example, it can be checked in real time whether the drill is working in the intended speed range, whether it is getting too hot or attrited. These and other key figures can be used digitally and increase quality, efficiency and (failure) safety. The industry-independent solution for this on the sensor side is called 'INA-sense' and it fits into a transportable case.

Predictive maintenance and automated object recognition

Beckhoff, KEB, Lenze, Phoenix Contact, WAGO and Weidmüller, global market leaders from the automation industry, will also present new approaches in the field of machine learning. Visitors can thus obtain an exceptional overview of all the different solutions and their added value.

Weidmüller presents a live application for predictive maintenance that has already been implemented at compressor manufacturer Boge. By means of Industrial Analytics, the future need for maintenance can be predicted during operation which allows for an optimal planning of repair and service work. Anomalies are detected and classified early by comparing them with automatically learned models based on real-time data. This enables the operator to react accurately to potential problems before they affect the performance of the machines or equipment.

The automatic detection of objects is required in numerous industries: from the automotive industry to logistics. Before technical systems can recognize an object, they must "know" its characteristics. The Cluster of Excellence CITEC at Bielefeld University has developed the mobile and cost-effective 'TeachME' system, which learns new objects and their characteristics in a matter of seconds. At the push of a button, the system takes a picture of the object to be learned and processes it by means of artificial neural networks containing pre-trained models of objects. The system shows properties and other object data on a display. Small companies often do not have large computing capacities and sometimes lack the expertise for machine learning. This new system conserves resources, can even be operated using rechargeable batteries, and is intuitive to use.

Open up new customer accounts with smart services

In order to remain competitive, manufacturing companies must increasingly interlock their products with services. Digital platforms enable them to offer customers an end-to-end solution from incoming orders to production and logistics. One outstanding example of this is ADAMOS. The aim of the platform is to bundle know-how from mechanical engineering, production and information technology, to develop solutions for digital production, to promote new business models and to set a new standard for industry. The ADAMOS partner network unites machine builders, solution providers and IT experts for the development and operation of digital solutions based on the ADAMOS IIoT platform.

DENIOS AG also relies on smart services for the hazardous substance management of the future. Since the operation and maintenance of a hazardous substance warehouse is subject to comprehensive legislation, the company wants to support customers with data-based services for a proper and efficient operation. The 'DENIOS connect' app is intended to facilitate access to a variety of smart services. The 'Maintenance' and 'Condition Monitoring' modules reduce operating as well as maintenance costs and enable both early detection of process risks and targeted fault management to avoid downtimes. Customers can also access comprehensive documentation online. The 'Warehouse Management' module will help increase storage security.

From digital model to intelligent product

Miele, Dassault Systèmes and Fraunhofer IEM showcase how tomorrow's product innovations will become possible. Smart home, autonomous driving, networked production - these innovations would be inconceivable in the future without an intelligent development process. This also applies to the household sector. Systems are becoming more and more complex, and Miele is

increasingly using new methods of product development (Advanced Systems Engineering) for their design, development and production.

With the help of the Miele and the 3DEXPERIENCE platform from Dassault Systèmes as examples, visitors can see how the entire product life cycle is modelled, communicated and optimised using technology. On this basis, all production steps can be simulated and optimised virtually. Thanks to intelligent digital models, workplace design, assembly steps or the use of robots can be planned and communicated at an early stage. Individual processes as well as planning scenarios can be changed, compared and optimised at any time.

Assistance systems relieve the strain on employees

By bundling large amounts of data (information fusion), assistance systems can precisely support people, for example by means of automated error control or user-centred assistance. InIT of the Ostwestfalen-Lippe University of Applied Sciences and Fraunhofer IOSB-INA demonstrate the XTEND assistance system, providing a situation-related Augmented Reality (AR) support with depth sensors in the camera. The user can select the appropriate input or output modality such as a tablet, a projection or data glasses at the workplace. The XTEND system cannot only be used by workers, maintenance or conversion instructions can also be projected onto any other system or displayed on the smartphone using augmented reality.

Innovative startups - from collaborative robots to additive manufacturing

New business ideas emerge from cooperation within the network. At the OWL joint stand, ten startups present their concepts for artificial intelligence, robotics, additive manufacturing, warehouse management and the use of drones. The goal of the Paderborn-based startup Unchained Robotics is to revolutionise existing automation solutions thanks to intuitive and intelligent control. Customers benefit from a system solution consisting of camera, software and collaborative robots (cobots). This reduces manufacturing costs for manual assembly of printed circuit boards in power electronics.

AMendate offers software for the fully automated optimisation of components for additive manufacturing. The Paderborn startup was founded in mid-2018 as a spin-off of Paderborn University. The software quickly creates seemingly organic structures with smooth, optimally shaped surfaces. All components are thus tailored precisely to their individual application areas which makes both the development and production of the components faster and more cost-effective. AMendate was awarded as most innovative startup of 2018 by the industry portal 3D-Natives.

Feeding the population using Vertical Farming in a resource-conserving way

Bielefeld University of Applied Sciences presents new approaches from projects of the Institute for Technical Energy Systems (ITES). The project 'Vertical Farming' investigates the use of textile substrates for an ecological vertical agriculture. In order to meet the needs of a constantly growing population, the destruction of natural habitats is increasing. With vertical systems, land and water requirements can be reduced and yields increased at the same time. This way, an important contribution can be made to innovative, efficient and at the same time resource-saving agriculture. Visitors can experience how 'Vertical Farming' works at an exhibit. Textiles are used as the substrate for the crop plants, which, thanks to their diversity of materials and shapes, enable environmentally conscious cultivation that is optimally adapted to the respective plants.

Leading-Edge Cluster it's OWL

In the technology network it's OWL - Intelligent Technical Systems OstWestfalenLippe, more than 200 companies, research institutes and organisations jointly develop solutions for intelligent products and production processes. With the support of the State of North Rhine-Westphalia, projects worth 100 million euros will be implemented between 2018 and 2022. The main topics are artificial intelligence, digital platforms, digital twins and work 4.0. Named as one of the Leading-Edge Clusters by the Federal Ministry of Education and Research, it's OWL is considered to be one of the largest Industrie 4.0 initiatives for SMEs. www.its-owl.com

For more information on the OWL joint stand and for photo material please go to www.its-owl.com

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