



KUKA at ICRA in Stockholm

Augsburg/Stockholm, May 2016 - From May 16 to 20, KUKA will be presenting three innovative corporate research projects at the world's largest robotics conference. The International Conference on Robotics and Automation (ICRA) in Stockholm offers researchers from across the globe a platform to present innovative solutions.

KUKA, the Augsburg-based automation specialist, is a sponsor of ICRA. "At ICRA, we will not only be showcasing our latest technological developments, but we will also be taking a broader view to discuss new scientific approaches for developing innovative ideas in the future as well", says Dr. Rainer Bischoff, Head of KUKA Corporate Research. Stefan Lampa, CEO of KUKA Robotics, adds: "Innovations are the driving force for the growth of a company. They strengthen the product portfolio and help to open up new markets."

KUKA innovations and projects at ICRA 2016

In Project AREUS, KUKA and its partners are developing technologies for the energy-efficient operation of robots. Using a KUKA Agilus robot as an example, the project partner Chalmers University of Technology will present a new kind of energy-efficient path planning, which, depending on the task, can achieve energy savings of up to 30%. The all-important

KUKA Aktiengesellschaft

Katrin Stuber-Koeppe
Press Spokesperson
Head of Corporate
Communications

T +49 821 797 3722
F +49 821 797 5213

press@kuka.com



peak consumption of energy can even be reduced by up to 60%. This will be demonstrated to visitors by the robot executing a path firstly with conventional planning and then with the energy-optimized method.

A laser pointer will be used to visualize that the optimization does not alter the geometry of the path. The energy consumption measurements will be displayed on a monitor in real time so that visitors can track the effects of the new method on energy consumption at all times. A further special feature of the application is the use of the innovative KUKA Sunrise control software. Currently, the software is not integrated as standard in the Agilus. However, the application offers an exciting look into the optimization potential in this area of KUKA industrial robotics.

A smart LBR iiwa lightweight robot demonstrates machine learning by using an algorithm to classify and sort various objects. The sample objects are shown to the system in a training phase. Attributes such as size and color are captured via a 3D camera and the robot receives instructions from an operator on how the objects are to be sorted – namely, to the left or to the right. A mere ten exercises are necessary for the robot to learn the criteria. Following this, the program can then even automatically assign new and unknown objects. If something should ever go wrong, the operator can correct the error. In other words, the robot learns continuously, adapting to changes and constantly improving. This provides an opportunity for the topic of intelligent robotics to be discussed with experts from all over Europe.

Additionally, the youBot in a box concept study shows that robot education, training and research can be performed easily and safely from one's desk – without losing sight of industrial uses. The *youBot in a box* is a five-axis robot arm with a two-finger gripper and is connected to a computer via an Ethernet cable. This computer runs KUKA Sunrise OS software, which is used to control the robot. The *youBot* can be programmed in Java via KUKA Sunrise.Workbench. Since this pro-



programming environment is also used for large KUKA industrial robots, the *youBot* in a box is the best and quickest way for students, researchers and end users to enter the world of KUKA robotics.

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KUKA Aktiengesellschaft

KUKA Aktiengesellschaft is a globally active automation company with sales of around 3 billion euro and 12,300 employees worldwide. The company is one of the world's leading suppliers of automation solutions. From components to robots, cells and even large-scale systems – KUKA offers its customers tailored solutions from a single source. The company is headquartered in Augsburg. KUKA operates internationally for customers from the automotive industry and general industry.