



Press release

Robot Colleagues Communicate Their Destination Via Laser Projection

DFKI demonstrates at CEBIT how LAP laser projection systems provide visual support in human-robot cooperation

How can humans and machines interact as colleagues in Industry 4.0? The German Research Center for Artificial Intelligence (DFKI) will demonstrate how a laser projection system provided by LAP can be used to foster intelligent interaction at this year's CEBIT, June 12-15 in Hanover, Germany. At the German Federal Ministry of Education and Research (BMBF) stand (hall 27, stand E 52), the DFKI will demonstrate intelligent human-robot cooperation (HRC) in a hybrid manufacturing scenario.

LAP GmbH Laser Applikationen, Lüneburg (Germany), June 2018

“Attention. A transport vehicle is approaching its destination from the right. The estimated time until arrival is 30 seconds.” This is one way a robot could inform its human colleagues of an approaching transport order. What's so unique about this type of interaction is its visual component, made possible by laser projection e.g. onto the floor at the expected destination of the transport vehicle. A laser projection system provided by LAP is integrated into joint projects and is part of a manufacturing scenario which the DFKI will be exhibiting at CEBIT. They will show how humans and robots can work together and intelligently communicate with one another in a versatile production environment.

Arrival time and position of destination projected via laser technology

The LAP CAD-PRO laser projector can be used to prepare employees early on for cooperative interactions with robots or to indicate the possibility of them. In a hybrid manufacturing setting, an autonomously moving robot platform would be able to accept transport orders, gather the necessary components, and bring them to the relevant workstation as needed. Laser projection would enable the robot supplier to indicate visually when it is approaching. Text and symbols projected via laser could provide information about time of arrival or destination position. This visual information would help employees 'communicate' with the robots and incorporate the information into their plans and actions.

Efficient support for versatile production processes

However, the idea goes further than this. The laser projection system is integrated into a service-based Industry 4.0 infrastructure and can be controlled via a service interface. This open service platform could be used to choose one or more laser projectors as components suitable for integration into different applications, thus providing efficient support for the dynamic, versatile production processes demanded by Industry 4.0.

A service-based Industry 4.0 platform provides the foundation

The development of this Industry 4.0 infrastructure is aim of the BMBF-funded joint BaSys 4.0 project. The software platform will make it possible to provide the required services and link them with the various components and machines. What's more, the infrastructure will provide an efficient and time-saving way to reach the level of dynamism needed for Industry 4.0 production systems. As a

requirement for the implementation of a number of Industry 4.0 solutions, the Plug&Produce process contributes to permanent production optimization.

A demonstration of how the BaSys 4.0 service platform can be used for HRC integration will be given at the German Federal Ministry of Education and Research stand (hall 27, stand E 52), using a dynamic milk run scenario. More information at: <https://www.dfki.de/web/news/dfki-cebit-2018>

Laser projection in Industry 4.0 applications

Laser projection in Industry 4.0 can be used for much more than just visual communication between humans and robots. Laser projection systems can make employees' work easier in partially automated assembly processes, as well. For instance, CAD-PRO laser projectors allow complex polychromatic contours based on CAD data to be projected onto 3D objects with precision, indicating where a component is to be installed directly on the object itself. This reduces the human workload, and supports employees in their activity by means of specific digital instructions.

Assembly assistance system in the Robotation Academy

At CEBIT, visitors can get a hands-on experience of an assembly assistance system in the 'Robotation Academy' (Pavillon 36). In the scenario of a digital factory, they can experience Industry 4.0 and produce their individual pens in lot size 1. The product passes through the typical stations of a real production from the picking, through the processing at the CNC machine, the laser engraving and finally to the assembly of the individual components. This is where the CAD-PRO laser projection system comes into play: the CAD-PRO laser projector is mounted above the assembly workplace and displays laser lines to indicate how the pen should be assembled.

About LAP

LAP is a worldwide leader in the field of laser-based systems for projection and non-contact measurements. For more than 30 years, LAP has developed, manufactured and distributed laser measuring systems, line lasers and laser projectors for industry and medicine. Numerous international industrial corporations rely on the precision technology Made in Germany for improvement of the quality of their products and the effectiveness of their production processes.

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