

**FRAUNHOFER IGD: THE INTERNATIONAL LEADING
INSTITUTE FOR APPLIED RESEARCH IN VISUAL COMPUTING**

Competence Center “Interactive Engineering Technologies”
Topics and competencies at a glance:

- Geometry processing
- Real-time visualization
- Interactive simulation
- Semantic computing

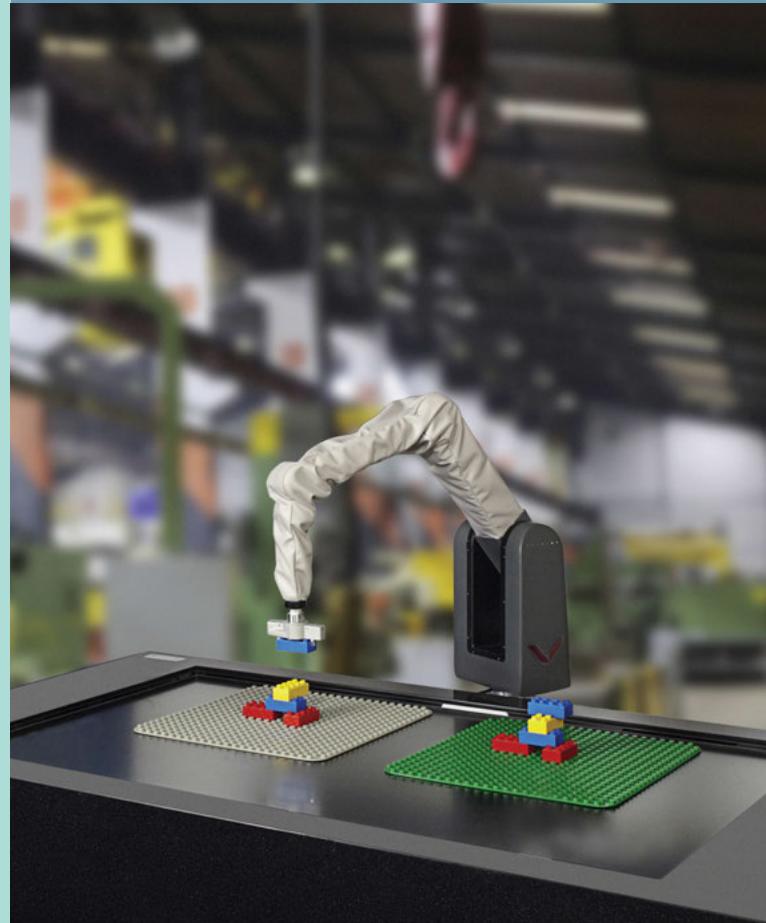
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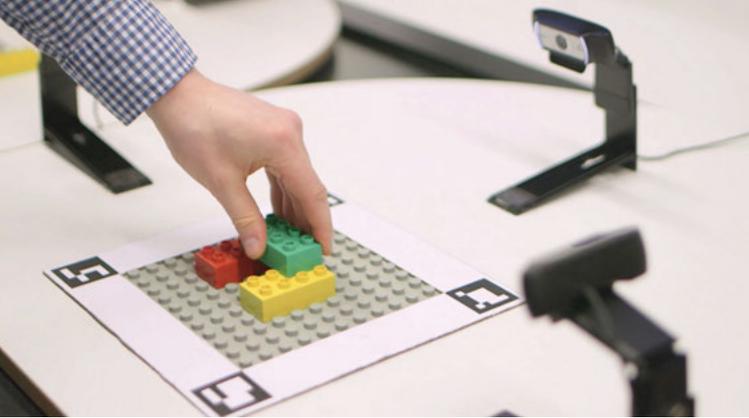
Fraunhofer Institute for Computer Graphics Research IGD
Competence Center “Interactive Engineering Technologies”
Fraunhoferstrasse 5
64283 Darmstadt, Germany

Prof. Dr. André Stork
Head of Competence Center
Phone: +49 6151 155-469
andre.stork@igd.fraunhofer.de

www.igd.fraunhofer.de/iet

DUPLOCATOR
FLEXIBLE MANUFACTURING OF
INDIVIDUALIZED PRODUCTS





DUPLOCATOR – FLEXIBLE MANUFACTURING OF INDIVIDUALIZED PRODUCTS

One of the challenges in the 4th industrial revolution is to make production processes more flexible without necessitating complex and time-consuming teach-in procedures in an upstream process step.

The idea...

Computer graphics and computer vision have a big impact in the field of cooperative, flexible and autonomous robots. They allow to give robots cognitive abilities in order to communicate and cooperate not only with humans but also with other technical systems.

...about the demonstrator...

A user builds an assembly group of Duplo bricks. The scene is captured by cameras. An image analysis module visually inspects the end configuration of the assembly group including the position and the orientation of the bricks. A sequence of assembly instructions for the robot is automatically derived. Finally, the real robot or its digital twin reconstructs the initial assembly group.

...and more scenarios...

Under certain circumstances, however, the robot might need to assemble the bricks in a different sequence than the man or woman did. One reason is that it is unable to work with both hands and must take into account statics and physics. Here, there will be a lot of room for other advanced simulations in the future, such as the integration of deformable materials.

...all the way to the applications

Visual communication and intention visualization between robots and humans is becoming an increasingly important field. Our scenario is based on computer graphics, computer vision, scene understanding and robotics.

Our approach is applicable for further future factory scenarios and is designed to support Human robot collaboration. Example application scenarios comprise placement, commissioning and packaging. The competence center for "Interactive Engineering Technologies" is looking for partners to adapt our approach to their individual requirements.