1 *Gesture control of a collaborating heavy-duty robot at the testing facilities of Fraunhofer IWU*
2 *Rework station for welding of an underbody at Volkswagen Sachsen GmbH at the plant in Zwickau*

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MORE THAN PURE GESTURE CONTROL FOR PRODUCTION

Controlling heavy-duty robots for Human-Robot Interaction (HRI)

At Fraunhofer IWU heavy-duty robots are qualified in order to meet the requirements of Human-Robot Interaction. For this purpose research and development activities are carried out, among other things, regarding 3D dynamic safety systems, smart optical sensors, innovative image processing methods, autonomous algorithms for path-planning and intuitive human-machine interfaces. The results are then combined to overall systems.

In a current project some of these development modules are integrated into the production processes at Volkswagen Sachsen GmbH at the plant in Zwickau. Here a HRI system based on gesture control is implemented for reworking in welding processes. The system allows the technicians to individually position an entire underbody in order to perform the actual welding task as efficiently and ergonomically as possible.

Safe and intuitive use of gesture control

Control and communication between humans and robots are essential for their direct collaboration. For this interface Fraunhofer IWU implements own methods and algorithms that are reliable, safe and economic. Reliability is characterized, for example, by the robust and marker-free detection of humans, hands and static or dynamic gestures. Safety is ensured, e.g. by approvable sensor systems and safe signal processing. Current and future requirements for data protection are met by local data processing and by methods of anonymization. Optimized software, the application of commercially available components and modern simulation processes promise good integration capability, efficient commissioning and economic operation.