PRESS RELEASE

The Giant: A Large, Powerful and Precise Robot

With a flexible designed robot that allows to handle heavy payloads over long ranges, Fraunhofer IGP responds to demands of modern production processes in the shipbuilding and offshore industries.

Industrial production in the era of Industry 4.0 is characterized by a high level of automation and comprehensive digital equipment of the systems. This leads to short manufactoring times and a consistent high quality of the products. The use of industrial robots to optimize production processes is much prevalent. Especially manufacturing costs in laborious manual production steps can be reduced and employees are supported in ergonomically critical tasks. Nevertheless, there are areas, like the shipbuilding and offshore industry, which have been mostly excluded. This is due to the fact that in most cases small quantities where produced and above all there is the need to handle very large objects and high loads. Jointed-arm robots are often used in manufactoring tasks. Minor installation effort, a high flexibility and a comparatively small footprint are the key benefits. Commercially offered jointed-arm robots are available in a nominal load range of up to 2000 kilograms, with a maximum reach of about four meters. However, this is not sufficient to meet the reqiurements of the shipbuilding and offshore industry. For this reason new robot kinematics had to be developed.

A Modular System for Absolute Flexibility

Within a research project, in cooperation with the Rostock-based IMG mbH and the University of Rostock, an electrically driven robot with a new parallel kinematics concept has been developed. The realized prototype is able to move in range of five and a half meters and to handle payloads up to four tons. In development, both in terms of mechanics and control components, emphasis has been placed on scalability and flexibility regarding to ensure various operation purposes. Due to its modular design the robot is adaptable in terms of maximum reach and payload. To achieve that, arms and links are engineered in a way, to replace them very easy. The robot system is equipped with a simple user interface that allows operators without special knowledge to built programs for complex tasks quickly and economically at the workplace.

Editing
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The Developers

The Fraunhofer Institute for Large Structures in Production Technology, based in Rostock, was founded in 2000. There are currently 53 scientists employed, with an operating budget of 7 million euros. The research focuses on tasks in the area of production, especially of large structures. Based on applied research, concepts for product and process innovations for future industries of the economy are developed. There are many collaborations with partners from the field of shipbuilding and steel construction, energy and environmental technology, rail and commercial vehicle construction as well as mechanical and plant engineering within research projects. Through close cooperation with the chairs of Production Technology and Joining Technology of the Faculty of Mechanical Engineering and Ship Technology at the University of Rostock, topics from basic research are also examined.