

# Robotics Innovation Center

Intelligent robotics from Bremen – working on the ground, underwater, in space and for the human

## Robotic applications in industry, civil protection and offshore regions

The Robotics Innovation Center (RIC) develops systems and concepts for the deployment of robotics in diverse areas – for instance the support of workers in logistics and production, the exploration and evacuation of dangerous areas and for maintenance works in inhospitable environments such as the deep sea.



At the RIC, „Human-Centric AI“ and robotic solutions for the industry go hand in hand. As one of two Bremen-based research departments of the DFKI, the RIC is characterized both by its strong ties with the industry as well as the conviction that AI-enabled robotics can support humans. One example for this is the area of logistics, which represents an important economic sector for the port of Bremen and whose processes can cause great physical stress for the staff. For this reason, the RIC has developed concepts for supportive mobile systems in the project KALI, which relieve workers in the manual handling of goods and make processes more efficient. The project

focuses on harbour logistics and involves not only the design of robotic applications, but also aspects of security and acceptability as well as ethical, social and legal questions that arise from the deployment of modular and mobile systems.

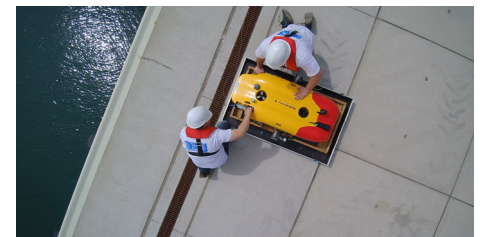


Apart from the direct support, humans and robots can also help each other and combine their strengths in so-called hybrid teams. In the project Hybr-iT, the RIC investigated and tested the requirements for components in hybrid teams, how robotic systems can be integrated and controlled and how they can cooperate seamlessly in existing structures.

The application area of civil protection involves both the cooperation with as well as the protection of the human. In the project ROBDEKON, the researchers of the Robotics Innovation Center examined techniques in order to use mobile and partially autonomous systems for the deconstruction and decontamination of industrial sites. In these high-risk areas, the human remains in control via teleoperation technologies which allow him to control the robot – such as the robotic system ARTER, which is based on a walking excavator and was modified for teleoperated as well as autonomous deployment.

Due to the proximity to the North Sea, the use of robots in offshore areas is also of great relevance. Together with the Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, the DFKI has opened the Test Center for Maritime Technologies on Heligoland island.

The centre includes a test field in the North Sea, which allows for realistic tests with drones, swimming systems or autonomous underwater vehicles in depths of up to 45 meters. The robots are developed for offshore inspection, maintenance and repair works which involve high risks for humans.



The connection between robots, control stations and other operating units has to be reliable even in the depths of the sea during low visibility and strong currents. For this reason, the RIC project Mare-IT has investigated, how stable and efficient information currents can be guaranteed during the deployment of autonomous underwater robots.

### Contact

German Research Center for  
Artificial Intelligence  
(DFKI)  
Robotics Innovation Center

Prof. Dr. Dr. h.c. Frank Kirchner



[www.dfki.de/robotik](http://www.dfki.de/robotik)



Robert-Hooke-Straße 1  
D-21359 Bremen



[robotik@dfki.de](mailto:robotik@dfki.de)

