Industrial partners

The ZfT (center for telematics) develops custom solutions for partners in the industrial automation industry. With our distinct knowledge in telematics, robotics and human-robot interaction we are able to transfer the current state of the art in international research to meet the requirements of actual problems in daily business.

REIS ROBOTICS

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For further information please visit our web pages or contact us directly. We are always looking forward to new challenges.

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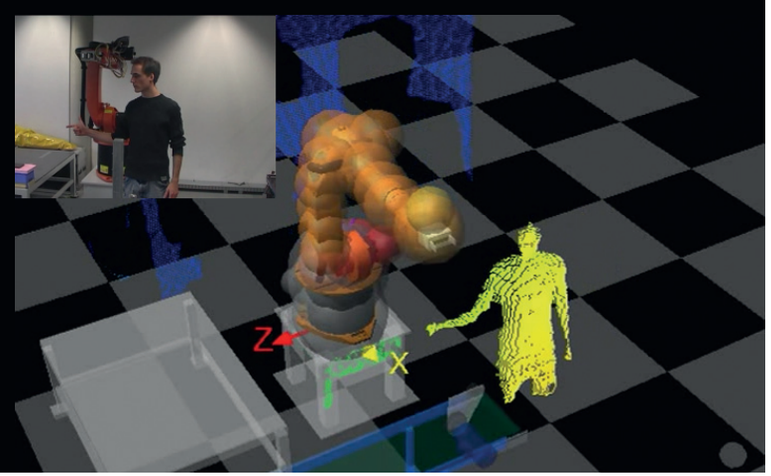
Smart Manufacturing by Advanced Robotics



Cooperative Human-Robot Interaction

Human-Robot-Collaboration

Industrial robots are no longer strictly spatially separated from their environment, but operate safely close together with a human co-worker, sharing the same work environment and performing a common task. Goal is to combine the strength and accuracy of the robot with the flexibility and deeper process understanding of the human operator.

Safety Requirements

This human-robot-collaboration has to be safeguarded under all conditions by additional safety functions, to avoid collisions between the manipulator robot and its environment. Different approaches have been investigated, for example monitoring distances with laser range finders, workspace supervision with (depth) cameras or touchsensitive casings for standard industrial robots.

Intuitive Data Representation and Control Methods

When working closely together with a robot, the human operator needs to understand the robot's behavior and data at a glance, and be able to intuitively control the assistance robot. Augmented Reality is one approach that allows an intuitive understanding of complex data, for example (pre-)visualizing the robot's movement, processing trajectories, sensor data or the expected work outcome. Data can be presented on monitors or projected directly in the work environment.

Telemaintenance of Remote Production

Telemaintenance Center

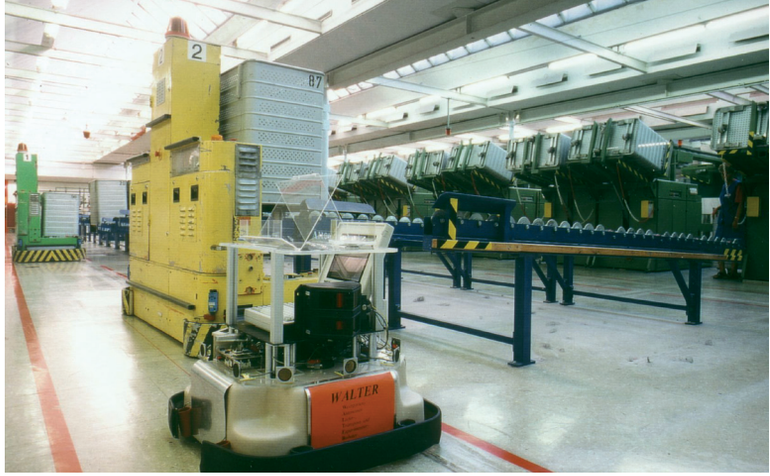
Complicated problems with industry robots require external expert knowledge. A telemaintenance center as an industrial internet application can provide direct access to the robot and the plant to facilitate human supervisory control. The human-machine interface needs to be well designed to enable situation awareness for the expert. It includes video feedback, autonomous control assistence functions, intuitive representation of sensor data and communication features.

Optimized Secure Internet Communication

Telemaintenance requires an individual combination of services and therefore a special software solution. The Adaptive Bandwidth management and Security system (AMS) ensures optimal utilization of the transmission link. It combines VPN-based security functions with intelligent QoS awareness.

Mobile Device for Local Interaction

In most cases, telemaintenance needs a local contact person, who interacts directly with the robot and the plant and ensures production safety. By using industrial usability methods an intuitive human-machine-interface has been developed. Different functions, like robot steering, maintenance checklists, failure feedback and augmented reality features have been realised for one smart device.



Autonomous Mobile Transport Robots

Objectives of Mobile Transport Robots

Mobile transport robots increase the flexibility of the material flow for industrial production and improve the efficiency of production logistics. By decreasing production costs, the use of mobile transport robots strengthens the market position of manufacturers. Furthermore, they increase the safety aspects for workers.

Retraro

Retraro is an inteligent Autonomously Guided Transport Vehicle (AGV) with enhanced security features. A central control system coordinates the traffic circulation of a huge number of AGVs supporting the production process. The AGVs themselves use an innovative navigation system based on intrinsic sensor information. Further they feature a reactive control system to compensate for the deviations between the expected and the actually encountered environment. Smart reliable control algorithms consider the constraints of the AGV and incooperate the dynamic environment and human factors.

Benefits

The material handling can be automated at an affordable cost, because transportation and production costs are reduced. The systems can adapt to change in production processes and establish a safe working environment.

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