

JOANNEUM RESEARCH Forschungsgesellschaft mbH



THE INNOVATION COMPANY

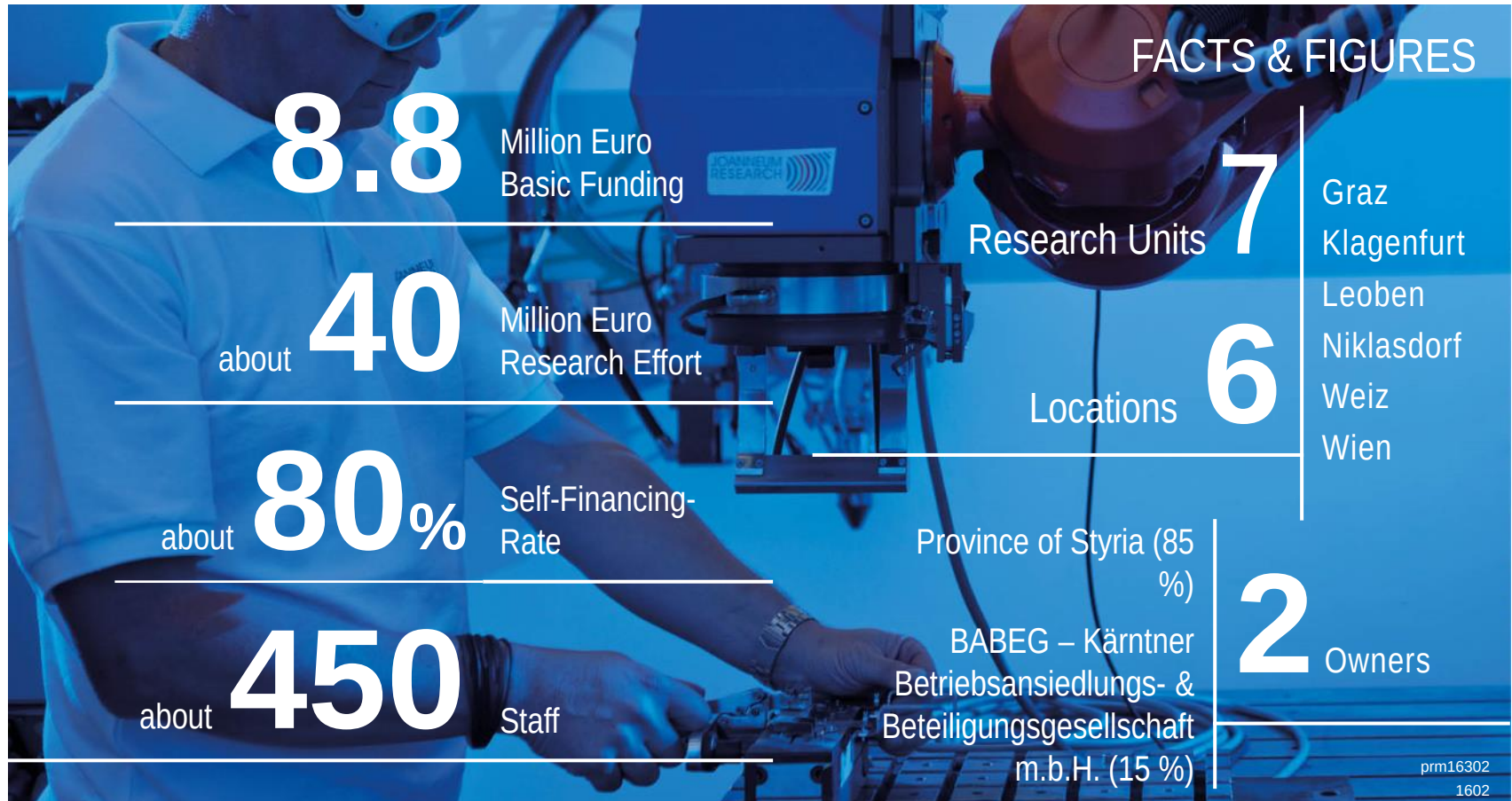
JOANNEUM RESEARCH Forschungsgesellschaft mbH is a leading research organisation that develops solutions and technologies for businesses and industries covering a wide range of sectors.

As an INNOVATION COMPANY focused on applied research and technology, it plays a key role in facilitating the transfer of technology and knowledge in Styria and Carinthia.



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3



ROBOTICS – Institute for Robotics and Mechatronics

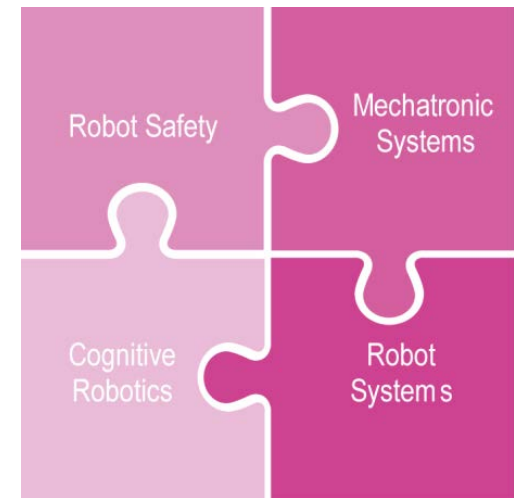
Director: **Dr Michael Hofbaur**

The Institute ROBOTICS of JOANNEUM RESEARCH addresses the industry's demand for applied research on robotic systems that serve as interfaces between the digital and the real world.



Key Activities & Research Focus

- R&D partner with know-how in the scientific & engineering foundations of robotics and mechatronics
- R&D at the interface between university-level basic research, applied research and advanced robotic system integration
- R&D and consultancy for robot- and functional safety
- Safety certification for robot systems
- Research Focuses:
 - Robot Mechanisms and Mechatronic Systems
 - Robot Systems
 - Cognitive
 - Robot Safety



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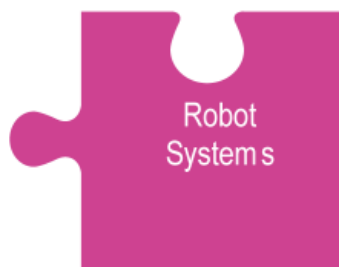
Fields of Research

6



■ Mechatronic Systems

- Mechanism design
- Redundant and modular robot systems
- Kinematics and dynamics
- Control theory and system automation
- Grasping and manipulation actuators



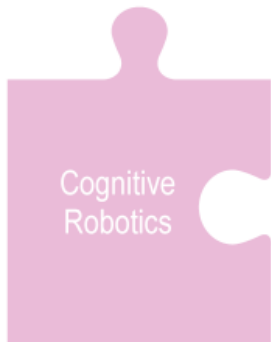
■ Robot Systems

- Complex system integration for safe and reliable robots
- Cyber-security and system integrity
- System engineering

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Fields of Research

7



■ Cognitive Robotics

- Artificial intelligence for (semi) autonomous system's operation
- Machine perception, data fusion and learning
- Human-robot interaction



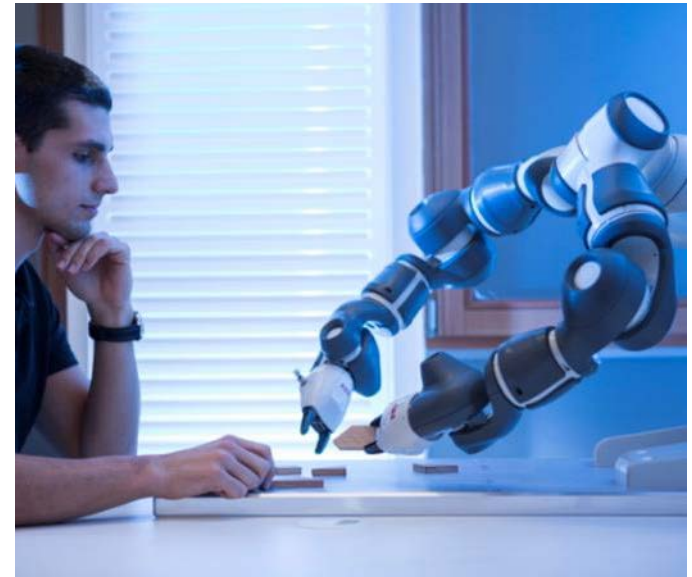
■ Robot Safety

- Safe human-robot interaction acc. to international standards
- Functional safety of robot systems and their applications
- System diagnosis and reconfiguration
- Safe and highly reliable sensors and actuators

Reference Projects

■ „Collaborative Robotics“

- Funding: Austrian Federal Ministry **bmvit**
- Collaborative research with other JR Institutes (DIGITAL and MATERIALS) and strategic industrial partners
- Contact: Dr. Rosemarie Velik
- Project Goal
New methods and applications of collaborative robots for smart production



Reference Projects

■ „Manipulation Systems for Sample Handling in a Sample Receiving Facility“

- Funding: European Space Agency (ESA)
- Focuses on Robotic Manipulation System for a Martian Sample Receiving Facility (MSRF)
- Contact: Dr. Michael Hofbaur

- Project Goal
 - Identification and definition of the specific requirements and capabilities for the remote robotic manipulation system with regard to the required operations in various stages of the MSRF (e.g.. receiving samples, cleaning and opening containments, etc.)

- More details in John Vrublevskis' (Thales Alenia Space UK Ltd) talk

MSRF relevant expertise

- Advanced kinematics – what's the best robot for a desired manipulation
- Robotic expertise in general
- Industrial gripping and intelligent grasp synthesis
- System monitoring, fault detection and system reconfiguration for dependable and reliable operation
- Advanced motion planning – smooth “jerk-free” motions – for visually and force-guided manipulation
- Semi-autonomous manipulation and intuitive human-robot interaction
- *Looking forward to learning more about your needs during this workshop!*

ROBOTICS location & infrastructure

11

ROBOTICS @ Lakeside

“institute under development”

Funded 2015

- Currently: temporary space @ lakeside's IKT buildings

By 2020:

- 45 roboticists and support staff
- 1.200 m² overall buildingspace incl. labspace for light-weight, mobile and industrial robotics



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