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Miro Innovation Lab

a Helmholtz Innovation Lab
German Aerospace Center (DLR)
Institute of Robotics and Mechatronics

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ein Helmholtz Innovation Lab

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DLR at a glance

DLR is the national aeronautics and space research centre of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport and security is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has been given responsibility by the federal government for the planning and implementation of the German space programme. DLR is also the umbrella organisation for the nation's largest project management agency.

DLR has approximately 8000 employees at 20 locations in Germany: Cologne (headquarters), Augsburg, Berlin, Bonn, Braunschweig, Bremen, Bremerhaven, Dresden, Goettingen, Hamburg, Jena, Juelich, Lampoldshausen, Neustrelitz, Oberpfaffenhofen, Oldenburg, Stade, Stuttgart, Trauen, and Weilheim. DLR also has offices in Brussels, Paris, Tokyo and Washington D.C.

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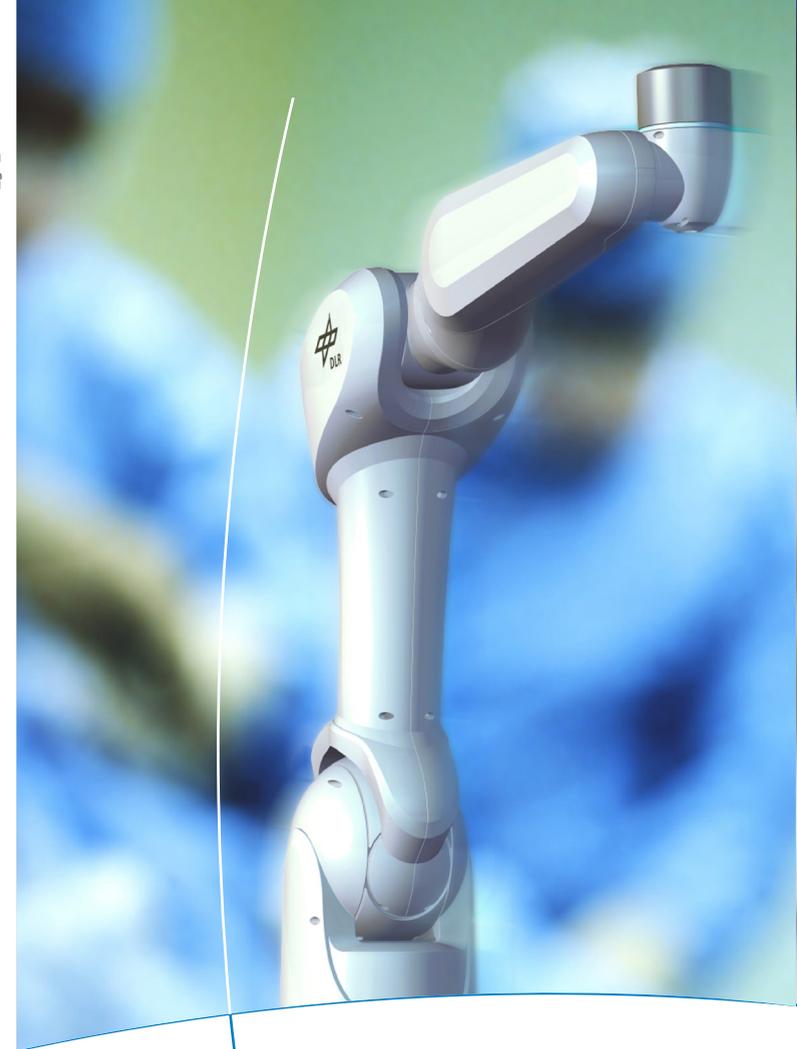
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MIRO Innovation Lab - MIL



Helmholtz Innovation Labs

Innovation Labs were established by the Helmholtz Association as a new format to strengthen interaction between industry and science and offer space for new ideas in the most uncomplicated way possible. In each of the Labs located at the Helmholtz Centers, ideas will be put into motion and technical innovations tested and brought to the market in collaboration between partners from research and industry. The program offers a great deal of flexibility with regard to project duration, partners, and future fields of application, making the individual Labs both “think and do tanks.”

Our basic technology: MIRO the medical robot

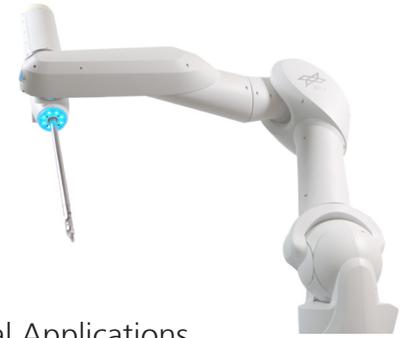
DLR's MIRO is a lightweight, kinematically redundant, fully torque-controlled robot arm specially designed for use in the medical environment (e. g. operating rooms). It enables immediate and safe interaction with the user and the patient. Low masses with a payload of three kilograms and a dead weight of around ten kilograms increase the safety during direct handling. Redundant kinematics with seven degrees of freedom give MIRO a mobility similar to that of a human arm. Sensor monitoring, signal generation and signal transmission are carried out with a control cycle of three kilohertz for supple motion sequences.

The MIRO Innovation Lab

The MIRO Innovation Lab implements the basic idea of the Innovation Labs in robot-assisted, interventional medicine. The establishment of the MIRO Innovation Lab at the Institute of Robotics and Mechatronics of the German Aerospace Center (DLR) in Oberpfaffenhofen allows the utilization of research infrastructures, systems and knowledge of the institute.

At the MIRO Innovation Lab

- we launch innovations and product developments with our partners,
- provide our know-how in the field of medical robotics (MIRO technology) and our clinical expertise,
- thereby open up new fields of application in medical robotics for our partners,
- thus facilitating access to the medical technology market,
- accompany the development process from the idea to prototype testing and
- offer our partners different formats and run times for cooperation.



Potential Applications

Joint development of robotic assistance systems for medical diagnostics and intervention

- mechatronic system design as well as system analysis and control
- sensory acquisition of information and intelligent processing (perception and cognition)
- automation and autonomy in the operating room
- (pre-) clinical examination of prototypical design (e. g. validity or usability)

Target groups

- Industrial enterprises
- Hospitals
- Research facilities

In particular, we open the MIRO Innovation Lab to smaller companies (SMEs) that have not yet had an opportunity to take part in the highly dynamic market of medical robotics.

Partner

Our partner for clinical expertise is MITI, the Minimally-invasive Interdisciplinary Therapeutic Intervention research group at the Klinikum Rechts der Isar of the Technical University of Munich. One of the unique features of MITI is that it is composed of a group of surgeons, engineers and gastroenterologists. New ideas can be tested for their applicability and prototypical developments in the real (pre-) clinical environment.

