



## **Medical Robotics Challenge 2.0: These are the finalists of the KUKA Innovation Award 2025**

**Augsburg, August 6<sup>th</sup>, 2024 – Gentler spinal surgery, better screening for vascular diseases, a robotic assistant for orthopaedics or a robot-controlled, portable MRI scanner: Five international teams have made it to the final of the KUKA Innovation Award with their robotics ideas for the future of medicine. The winner will receive €20,000 in prize money.**

New technologies are increasingly finding their way into operating rooms, hospitals, and rehabilitation centers. They can compensate for bottlenecks, enable gentler treatment, or better prevention. The motto of the KUKA Innovation Award 2025 is therefore “Medical Robotics Challenge 2.0”.

“Robotics will be increasingly used in the healthcare sector in the coming years and will open up countless new possibilities for the benefit of patients,” says Axel Weber, Vice President of the Medical Robotics business unit at KUKA. “This is also demonstrated by the ideas for the Medical Robotics Challenge 2.0 that we received from all over the world. Five teams particularly impressed the jury with their robotics concepts for improving prevention, medical treatment or surgical interventions.”

### **These are the finalists of the Innovation Award 2025**

#### Team SERA, Canada

Current robots in orthopedic surgery have limited cross-surgery capabilities, although many procedures have similar tasks to assess and repair damaged joints. The idea of Team SERA from the University of Waterloo aims to develop a robust collaborative multi-tasking robotic assistant for orthopedic surgery. The basis of this approach is the creation of modularized workflows where different types of tasks and tools can be adapted to the needs of a surgical procedure.

#### **Your Contact**

Teresa Scheunert  
Corporate Communications

T +49 821 797 3722

press@kuka.com  
kuka.com/iIMagazine



## Team AUROVAS, Italy

Due to a lack of medical staff, there are no ultrasound screening campaigns to detect dangerous and asymptomatic vascular diseases. The concept of Team AUROVAS from the University of Ferrara therefore includes an autonomous robotic system to perform standardized ultrasound procedures to identify relevant vascular indicators. The ultrasound image generated by the ultrasound probe moved by the robot is processed by a deep neural network that segments the vascular structures and provides the final indicators. The system addresses three use cases: detecting abdominal aortic aneurysms, assessing the jugular venous pulse in chronic heart failure, and performing compression ultrasound to detect deep vein thrombosis.

## Team ULTRATOPIA, Belgium and Switzerland

Pedicle screw placement (PSP) is a surgical technique used in spinal surgery to stabilize the spine in an anatomically challenging environment. It is most often used for spinal fractures, scoliosis and degenerative disc disease. Team ULTRATOPIA from the Belgian KU Leuven and Balgrist University Hospital of the University of Zurich, partners in the EU-funded FAROS project, presents an advanced approach using collaborative multi-robotic systems to improve the accuracy of pedicle screw placement through non-radiative imaging. It includes a robotic arm equipped with ultrasound to monitor and guide the robotic drill arm during the procedure. This approach aims to improve the precision of the PSP, reduce registration errors and account for physiological movements to ultimately improve surgical outcomes.

## Team HERMIS, Germany

The conventional MRI scanner offers excellent soft tissue contrast, 3D visualization and physiological monitoring capabilities, but the high cost of integrating such imaging devices into hospitals limits their widespread use in smaller clinics and resource-limited countries. The advent of low-field MRI technology has enabled cost-effective diagnostic solutions that are expanding access to magnetic resonance imaging (MRI) devices worldwide. These portable low-field MRI scanners are designed for imaging a specific region of the body due to their limited range of motion, workspace, and magnetic field strength. EndoSurge, a spin-off from the Max Planck Institute for Intelligent Systems, aims to solve these problems with the design and development of HERMIS (Human Endovascular Robotic Magnetic Imaging System), the world's first robotic, portable MRI scanner for versatile diagnostics.



## Team guidooSpine, Germany

The BEC Robotics team is developing an image- and tracking-supported robotic assistance system to plan and perform interventions on the spinal cord more efficiently using straight surgical instruments and implants. The biggest challenge is the close proximity to the spinal cord, which poses a significant risk of injury to the nerve cord. The challenges of the procedure can be exacerbated by possible displacement of the target vertebra during the procedure, for example due to the patient's breathing or movements, or the force exerted during the procedure. The robotic assistance system offers extremely high precision under pressure. This enables better health outcomes while reducing the likelihood of damaging nerves or arteries. Applications include tumour ablation near the spinal cord or the insertion of pedicle screws for spinal fusion, which are used to stabilize the spine.

## **KUKA Innovation Award 2025: What`s next?**

KUKA will provide the finalists with the collaborative robot LBR Med for the duration of the competition, which can be expanded with an NDI tracking system. The sensitive LBR Med is specially adapted to medical requirements and is particularly suitable for versatile assistance systems in medical technology thanks to its ability for human-robot collaboration. The final teams will present their concepts to an international audience of experts, visitors, media and investors at a major trade fair in 2025. The jury will then select the winner of the 20,000 euro innovation prize.

## **KUKA**

KUKA is an international automation group with sales of more than EUR 4 billion and around 15,000 employees. As one of the world's leading suppliers of intelligent, resource-saving automation solutions, KUKA offers industrial robots, autonomous mobile robots (AMR) including controllers, software and cloud-based digital services as well as fully connected production systems for a wide range of industries- primarily for markets such as automotive with a focus on e-mobility & battery, electronics, metal & plastic, consumer goods, food, e-commerce, retail and healthcare. The company is headquartered in Augsburg, Germany.