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# Department of Biodesign

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Advanced surgical technologies with visualization and analysis of intraoperative information

1. **Surgical Workflow Analysis and Skill Assessment on Minimally Invasive Surgery**
2. **Surgical Navigation and Robotic System with Automatic Control of Surgical Workflow and Procedure**
3. **Surgical Training System with Digital Analysis and XR Technologies**
4. **Medical devices and equipments development in collaboration with medicine and industry**

Our research focus is to establish surgical technology and products on "Interaction design technology between cyber-and physical space in surgery" by visualization and analysis technology of intraoperative information. Based on applied engineering (information communication technology, robotics, and bioengineering), for we are conducting research and development of integrated therapeutic medical device and medical informatic system.
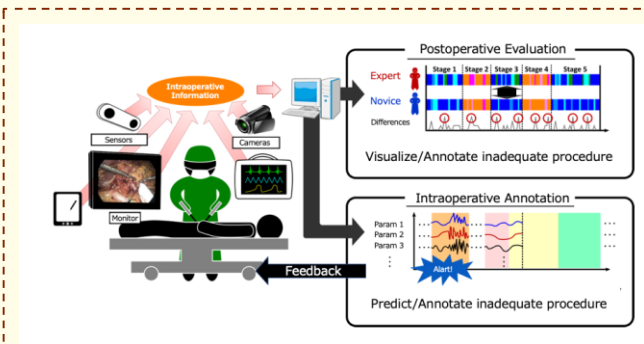
Surgical Workflow Analysis and Skill Assessment on Minimally Invasive Surgery

We are developing a method to quantitatively understand the performance of the surgeons' performance by automatically recording, collecting and analyzing information during surgery. Using this information, we are aiming to improve surgeons'skill and optimize their processes.
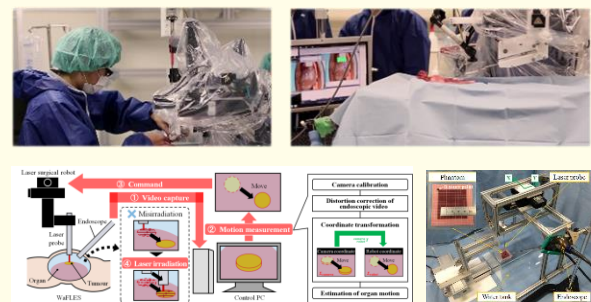
Surgical Navigation and Robotic System with Automatic Control of Surgical Workflow and Procedure

We are aiming to develop a surgical navigation and robot that provides optimal surgical guidance and automatic assistance based on surgical workflow and skill database and real-time measurement and prediction of the organ condition during surgery
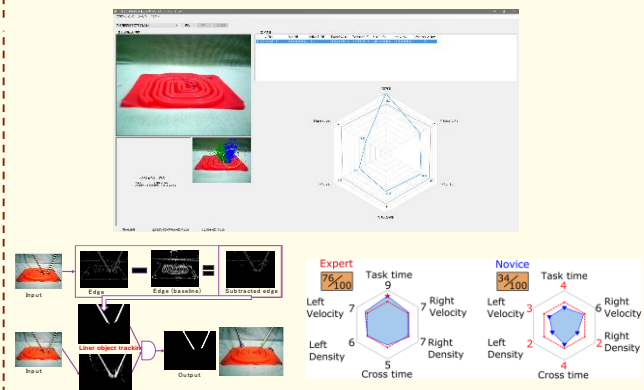
Surgical Training System with Digital Analysis and XR Technologies

We are developing a surgical training system that maximizes learning improvement through comparative evaluation with databases and effective teaching, based on quantitatively measuring and analyzing technology of the surgeons'performance.

Medical devices and equipments development in collaboration with medicine and industry

We are trying early social implementation of surgical education and surgery support products based on our research activities and knowledge. We are also engaged in eco-system research on medical product development from the viewpoint of management and economics.