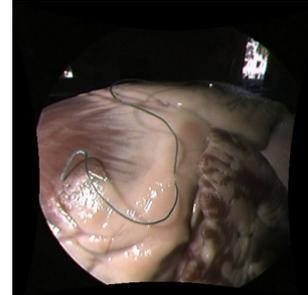
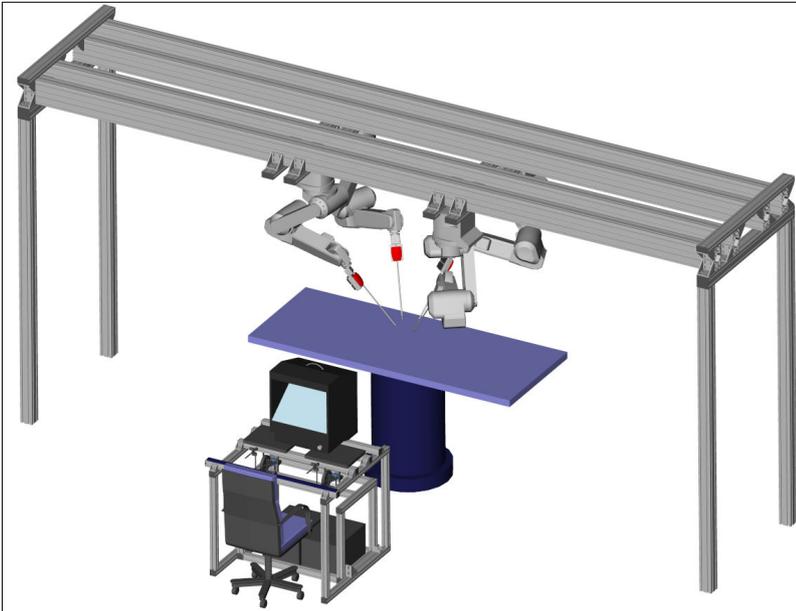


Master / Diploma Thesis: Image Processing for Medical Robotics

Keywords: Tracking, Medical Robotics, Image Analysis, Registration, 3D Reconstruction, UI Design, Data Visualization



Description: We have developed a robotic system for minimally invasive surgery. The manipulator of the system comprises four multi-purpose robots, which can be equipped with either surgical instruments or an endoscopic stereo camera.

Images of the stereo camera are already employed for **3D reconstruction** of relevant features (like surgical threads or blood vessels). In cooperation with **AWAIBA**, a vendor of image sensors, the overall procedure of image processing should be improved and miniaturized. Therefore, two small endoscopes will be directly attached to the surgical instruments in order to simplify calibration. The long-term goal of this application is an automatic **handling of a circular needle**.

The project will be implemented in close cooperation with the German Heart Center, and therefore most parts of the work will be carried out at the Inner City Campus (Arcisstr. 21). The workload can be split into subtasks, which enables a participation of more than one candidate (max. 3).

Prerequisites: Prospective candidates should have profound knowledge in image processing and in the implementation of corresponding algorithms in C++.

Application: please contact Christoph Staub (staub@in.tum.de)