

## Surgical Robot for Laser Osteotomy

**Context:** The Department of Biomedical Engineering (DBE) has recently been awarded a Flagship project from the Werner Siemens Foundation. The principal aim of this interdisciplinary project called Minimally Invasive Robot Assisted Computer-guided LaserosteotomE (**MIRACLE**) is the development of a minimally invasive robotic endoscope for cutting bone with a laser.

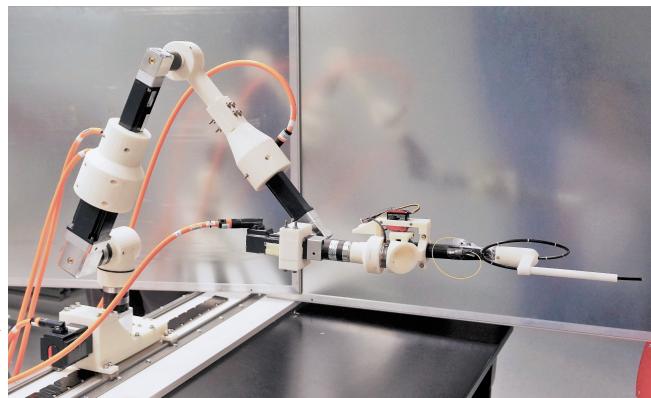
**Task description:** In this project, the Master candidate will participate in the development of a surgical robot for the manipulation of a semi-flexible endoscope. The robot has 6 DoF for the control of the position and orientation of the endoscopes tip and an additional DoF for the bending of the tip.

An initial prototype, named GG-1, (see attached figure) of the robot is already operational and currently we are developing for it new control schemes and path planning, and improving the mechanical design and teleoperation. The candidate will be able to get involved in the design, dynamics and control aspects of GG-1-s development.

Other possible tasks are the utilization of the robot in a surgical procedure: characterization of the task, programming the robot and evaluation of its performance.

### What we offer:

- You will be able to work on an entire robotic platform.
- You will learn kinematics, dynamics and control of robotic arms.
- You will join a team of medical doctors and engineers developing novel medical devices.



**Your Profile:** Background in mechatronics, mechanical engineering, biomedical engineering or in a closely related discipline. Excellent skills and practical experience in one or more of the following research areas: robotics, mechatronics, control, mechanical design. Fluency in written and spoken English is required.

Type: **Master Thesis**

Duration: 6 Months

Start: February 2018, negotiable

Professor: Prof. Dr. Georg Rauter

### Contact:

Georg Rauter:

georg.rauter@unibas.ch

Department of Biomedical Engineering  
Gewerbestrasse 14  
CH-4123 Allschwil, Switzerland  
t: +41 61 207 54 70  
Bio-Inspired Robots for Medicine-Lab  
www.dbe.unibas.ch/biromed