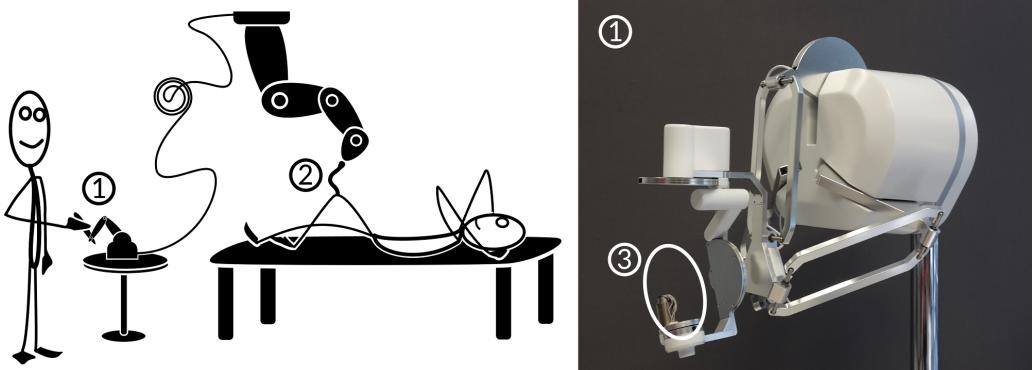


---

## Master Thesis: Intuitive Haptic Telemanipulator for a Robotic Endoscope

**Task description:** In this project, you will support our interdisciplinary team in developing an intuitive teleoperation interface ① for a robotic endoscope ②. The aim of this thesis is the development of an ergonomic handle ③ for our telemanipulator that allows to intuitively control the end-effector of our robotic endoscope. During this work, you will focus on the design of this handle as well as on the integration of all necessary functions into this handle. This handle will be the key interaction element of the surgeon with the robotic system.



### Your tasks:

1. Basic Research: Literature research on existing teleoperation devices and their handle design. Current knowledge about ergonomic design and human computer interfaces needs to be considered as well.
2. Concept Development and Shape Design: Based on the available literature and our project specifications, the requirements for the handle will be developed. With the help of the team's creativity, several basic prototypes regarding the shape of the new handle will be developed. These will be tested, evaluated, and adjusted systematically until only a handful of different shapes remain.
3. Design and Experimental Setup: For all of the remaining shapes, prototypes including additional handle functionalities (e.g. buttons, wheels, etc.) will be designed and built. Also, the electronic communication with the teleoperation device needs to be developed and implemented.
4. Prototype and Evaluation: Testing and evaluation of the prototypes in a small user study. Based on the results of this study, the most promising handle is chosen and integrated into the teleoperation device.

---

Start: August 2017, Duration: 5 months

**Student:** Patrick Salz

**Contact:** Esther Zoller, PhD student

esther.zoller@unibas.ch

t: +41 61 207 54 72

[www.dbe.unibas.ch/biromed](http://www.dbe.unibas.ch/biromed)

**Supervisor:** Esther Zoller

Professor: Prof. Dr. Georg Rauter

Professor FHNW: Prof. Werner Baumhakl



**BIROMED-Lab**

Medical Robotics and Mechatronics