Gisela and Erwin Sick
Chair of Micro-Optics

Prof. Hans Zappe

Research Area
Endomicroscopy
Medical Imaging

Relevant Tasks
☒ Optical experiments
☒ Test setup development
☒ Device characterization
☐ Material characterization
☒ Optical simulations
☐ FEA simulations
☒ Clean room fabrication
☒ CAD/CAM
☒ 3D Micro/Nano printing
☐ Polymer fabrication
☐ Programming
☒ Analytical analysis / Theory
☒ Literature research
☒ Teaching

Eligible Departments
☒ Microsystems technology
☒ Mechanical engineering
☒ Process engineering
☐ Chemistry
☒ Physics
☐ Electronics and IT
☐ Computer science
☐ Industrial engineering

Starting Date
01.09.2020

Contact Person
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PhD Thesis Project

Morpho-molecular Endomicroscopy for *in vivo* Colorectal Cancer Diagnosis

We are looking for a talented and motivated doctoral candidate to work in the field of multi-modal endoscopic imaging systems targeting optical detection of tissue pathologies without the need of traditional biopsy. The project will be carried out in coordination with a large consortium comprising leading European academic, clinical and industrial partners, with funding provided by the Horizon2020 program. The final goal of the project is the development and clinical validation of a completely new endomicroscopy system that performs high-resolution morpho-molecular imaging via optical coherence tomography and Raman spectroscopy.

The prospective student is expected to perform a detailed the optical and mechanical design study in collaboration with the project partners. The key functional component will be a novel ultra-miniaturized optical microsystem for large angle laser beam scanning. A biocompatible and autoclavable endoscope packaging strategy will be developed in tandem with a medical device manufacturer to ensure compatibility with the related medical device standards. Once the endoscope system is completed, the student will also take part in clinical experiments to demonstrate the performance of the entire system in a relevant operation environment. In addition to the research activities, the prospective student is also expected to assist in the teaching activities of the laboratory and supervise MSc and HiWi students.

The University of Freiburg offers a competitive and international research environment at the epicentre of the beautiful Black Forest region. Here you will find a friendly work environment with state-of-the-art infrastructure, and a rich social life of traditional German University City. The duration of the position is 4 years with 100% employment following the DFG guidelines.

Qualifications:
Candidates with an MSc degree (or equivalent) in electrical or microsystems engineering, alternatively physics or mechanical engineering with a background in optics are welcome. Proven proficiency in written and spoken English is a must; German is a strong plus.

Application procedure:
The application should be sent by e/mail and be attached as pdf-files, as below:

- CV: (Please name the document: CV_Family name)
  - CV
  - Two references that we can contact.
- Cover letter: (Please name the document as: Cover letter_Family name)
  - 1-2 pages where you introduce yourself and present your qualifications.
  - Previous research fields and main research results.
  - Future goals and research focus.
- Other documents (if available):
  - Copies of bachelor and/or master's thesis.
  - Attested copies and transcripts of completed education, grades and other certificates, eg. TOEFL test results.