

Doctoral dissertation proposal - 3D Retinal imaging with OCT (Optical Coherence Tomography) coupled with adaptive optics

The thesis will be completed at two sites:

Imagine Eyes (Orsay, France)

Young, dynamic and successful, Imagine Eyes develops and markets an innovative line components and devices for ophthalmic diagnostics. The company's products are based on adaptive optics, a technology originally designed for astrophysics, in order to better treat vision problems and retinal diseases. Creativity, innovation and quality are at the heart of Imagine Eyes' strategy for success.

Center for Medical Physics and Biomedical Engineering (Medical University of Vienna, Austria)

The underlying goal of this research project is to apply biomedical and optical technologies to the development, design, and realization of a new imaging modality. Optical imaging involves a fusion of photonics, biology as well as (bio)medicine and deals with the interaction between light and biological matter. It offers tremendous opportunities for biotechnology development as well as fundamental and applied translational research. The introduction of photonics, such as lasers and optics, into biotechnology has set new paradigms for non-invasive medical diagnostics. In particular, this Center has been pioneering research in the field of Optical Coherence Tomography (OCT) as well as vascular laser diagnostics since the late 1980s (Prof. Fercher). The current focus is the development and application of ultrahigh-resolution, high-speed, contrast-enhanced as well as functional OCT.

Job description

In the context of a European FP7 project with the acronym FAMOS that regroups, amongst others, Imagine Eyes and the Medical University of Vienna, the latter has an opening for a doctoral student's thesis project. This doctoral thesis will be performed under the direction of Professor Wolfgang Drexler of the Medical University of Vienna.

One of FAMOS' objectives is the development of an imaging device capable of cellular-level 3D retinal imaging. To achieve this, the instrument will incorporate adaptive optics into an OCT imaging system. The thesis project will be performed at two sites:

- Imagine Eyes, Orsay France, during approximately the first 9 months,
- the Medical University of Vienna for the duration of the thesis.

The thesis will include, among others, the following points:

- Optical conception of the device that will combine adaptive optics with Swept Source OCT
- Project planning and coordination
- Participation in the research process:
 - Needs analysis and definition
 - Use the information from the precedent point to pinpoint and propose technical solutions (including those for the conception of the imaging device based on Swept Source OCT and adaptive optics)
 - Organize and conduct testing
 - Conceptual and technical validation

Desired profile

- Technical background with strong accent in optics
- Technical skills include applied optics, electronics and IT
- Working written and oral level of French, German and English is necessary
- Autonomous, curious, well organized and enthusiastic

Education

- University degree in engineering or other scientific domain

Location

- Orsay (91400 in close proximity to the Parisian suburban rail line "RER" and Vienna (Austria)

Type of contract

- Thesis financed by the Medical University of Vienna

Contact

- Please send CV and letter of introduction with the reference OFE 1210 001 by e-mail to jobs@imagine-eyes.com or by postal mail to Imagine Eyes, Director of Human Resources, 18 rue Charles De Gaulle, 91400 Orsay