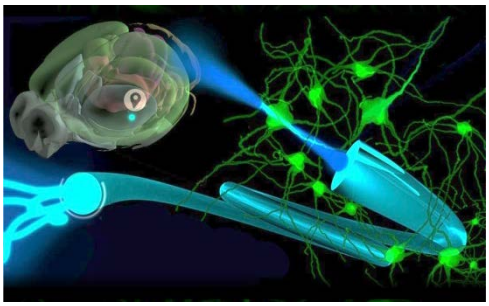
Postdoctoral Position: Development of a Holographic Endo-Microscope for Imaging in Freely Moving Mice



We are seeking a highly motivated and skilled postdoctoral researcher to join an exciting and groundbreaking project aimed at advancing neuroimaging technology. The project focuses on the development of a holographic endo-microscope for in-vivo imaging of brain structure and neuronal activity in freely moving mice. This work will push the boundaries of neuroimaging and has the potential to revolutionize how we study brain function, cognition, and disease progression.

Project Overview

The project is part of the NEUROGATE initiative (https://www.leibniz-ipht.de/en/illuminating-the-brain-new-imaging-technology-for-neuroscience/). It builds on innovations in holographic endoscope technology, a minimally invasive imaging tool that allows for real-time monitoring of neuronal signaling and structural changes at the subcellular level in live animals.

The current work focuses on technological advancements towards repeated imaging in freely moving animals through implementation of:

1. **Bending-resilient optical fibers**, ensuring that the light flow remains calibrated despite movement.
2. **Brain-scope interfaces** that allow for chronic monitoring of the brain's structural connectivity and activity, minimizing tissue damage during repeated imaging sessions.

The end goal is to achieve TRL6 by validating the methods under real-world conditions at the Institute of Scientific Instruments, Brno and through a study of dopaminergic circuitry with one of the key partners at NERF (Leuven). DeepEn GmbH, a young startup company founded as a spin-off from IPHT, is a key project partner offering a direct route to technology transfer as well as future opportunities for the successful candidate after the project's completion.

Key Responsibilities

- **Optical Setup Development**: Implement bending-resilient modules of the holographic endo-microscope system.
- **In-vivo Imaging**: Work with animal models to conduct in-vivo imaging experiments, including monitoring neuronal activity and structural connectivity in the brain.
- **Collaboration**: Collaborate with academic and industrial partners to refine and optimize the holographic endoscope, including testing the technology in real-world conditions.
- **Technology Transfer**: Assist with the transition of developed technologies into a commercial setting, collaborating with DeepEn GmbH and academic partners to further develop the system for broader use in neuroscience.
- **Data Analysis**: Analyze imaging data to assess system performance and biological insights gained from chronic monitoring of the brain's structural and functional connectivity.

Candidate Requirements

- **Strong Background in Optics**: PhD in optics, physics, engineering, or a related field with a focus on optical imaging, waveguides, or holography.
- **Experience in Optical Setup Design**: Proven experience in designing and building complex optical systems for advanced imaging applications.
- **In-vivo Imaging Expertise**: Experience with animal models, particularly in-vivo brain imaging, or a strong desire to work with animal models in neuroscience research.
- **Technical Skills**: Proficiency in experimental techniques, including optical alignment, automatic experiment control (LabView), data acquisition, and image analysis (Matlab).
- **Motivation for Technology Transfer**: Interest in the commercialization of innovative technology and the ability to work in a startup environment with a potential transition to industry.

What We Offer

- **Innovative Research**: Join a cutting-edge project at the forefront of neuroimaging technology with the opportunity to contribute to groundbreaking scientific discoveries.
- **Collaboration with Leading Institutions**: Work with a strong consortium of academic partners (Leibniz Institute of Photonic Technology, Czech Academy of Sciences, and Neuro-Electronics Research Flanders) and a young innovative startup (DeepEn GmbH).
- **Future Career Opportunities**: An exciting project to build on in future academic career. Additionally/alternatively, as a key partner of the project, DeepEn GmbH offers excellent post-project career opportunities within a growing startup at the intersection of academic research and commercial technology.
- **Dynamic and Supportive Environment**: Be part of a dynamic research environment that fosters creativity, interdisciplinary collaboration, and scientific excellence.
- **Gross salary** of 27 000 – 31 000 eur/year

Application Process

Please submit your CV, a cover letter outlining your experience and motivation for the position, and contact details for at least two academic or professional references. Review of applications will begin immediately and continue until the position is filled.

Contact

For further information about the project and application process, please contact: Hana Uhlirova (huhlirova@isibrno.cz)

We look forward to receiving your application!

This position offers an exciting opportunity to work on the next generation of neuroimaging technology and make lasting contributions to the understanding of the brain's connectivity and function. If you are passionate about advancing optical technologies and want to work at the cutting edge of neuroscience, we encourage you to apply.