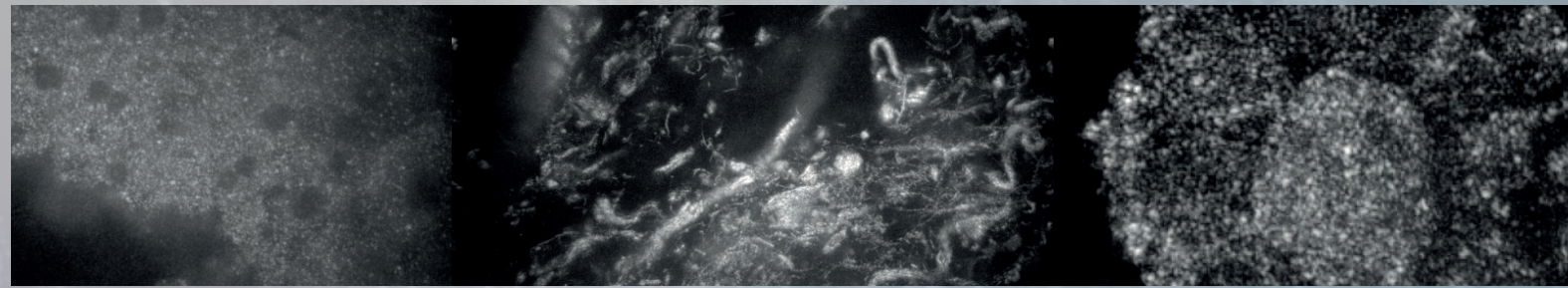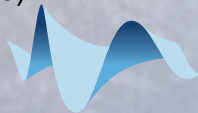# Implementation of an
ultra fast image acquisition interface

Starting date and duration : from february 2023 for 5 months and +

Lab: Institut Langevin (Paris 5ème)
CNRS, ESPCI, PSL University
Gratification: 600€/month

Institut Langevin
ONDES ET IMAGES

Supervisors: P. Balondrade, A. Aubry
Contact: paul.balondrade@espci.fr

Overview

Thanks to the advent of tunable lasers and high-speed cameras, 3D imaging of biological tissues at the microscopic scale is now at reach .
At Institut Langevin (Paris), we develop efficient algorithms based on a matrix formalism to numerically compensate for aberrations and multiple scattering [1], the two fundamental limits for deep optical imaging in biological tissues
This digital microscope leads an entirely new non-invasive microscopic imaging modality. Working closely with biologists, the goal is now to extract quantitative informations from dynamic 3D images of tissues at subcellular resolution such as a tomography of its refractive index or of its scattering mean free path   .

[1] A. Badon et al., Science Advances 6, eaay7170, 2020

Internship aim

As a member of a team of researchers, you will be involved in the development of next-generation computational imaging tools and AI applications. To do so, you will:

• participate to the development of the interfacing and optimisation of the ultrafast camera data transfer to the GPU for real time processing in C++
• build a UI to set and trigger image acquisition (some scripts are already written in python/C++ in order to make exemples)
• build a user interface to efficiently display the processed data

This position is the opportunity to take part in an innovative project within the academic world with strong potential for bio-medical applications.

Skills

• Master's degree in Physics, Applied Mathematics or Computer Science

• Proficiency in Python or C/C++

• Ideally, strong skills in optimization, machine learning

• Experience in Pytorch or Tensorflow is a plus

Benefits

• Located in the heart of the Latin Quarter

• Young team (Interns/PhD students/Post-Doc)

• Possibility to modify the internship's scope according to the candidate's skills

• Gap year accepted

• Possibility of a PhD after the internship

Send a CV to paul.balondrade@espci.fr