



Post-doc in bioimage informatics for large multidimensional microscopy datasets



A 2 year post-doctoral position in bioimage informatics is available at the Laboratory of Optics and Bioscience (LOB) at Ecole polytechnique, Université Paris-Saclay in Palaiseau near Paris, France. The general aim is to adapt or develop image processing or analysis algorithms for large dataset alongside usable integrated pipelines, to allow acquired fluorescence microscopy data to be exploited for biological insight, with a particular application on large stitched confocal/multiphoton stacks for developmental neuroscience.

Description:

Understanding the development of neuronal circuits requires tissue-scale measurements of multiple cellular features with micrometer resolution. Current development in fluorescence microscopy are allowing us to record very large multidimensional datasets [1,2], comprising up to tens of billions of voxels and "weighting" several hundred GB. But to properly exploit those datasets all the way to the biological insights in neuroscience or developmental biology they promise, one must adapt or develop algorithms for automated image processing and analysis, and integrate them into specific pipelines for storage, visualization, and annotation.

The Morphoscope project (<http://www.morphoscope.polytechnique.edu/>) aims at establishing state-of-the-art facilities for optical imaging and image analysis of living systems dedicated to in vivo multiscale investigations in integrative biology. In this context, the Laboratory of Optics and Bioscience (LOB) at Ecole polytechnique (Paris area, France) has an opening for a bioimage informatics specialist. He/she would work hand in hand with microscopists, biologists and data analysts with the aim of helping exploit developments in microscopy to help answer biological questions.

One specific project involve neuron segmentation and axon tracing in large high resolution multicolor 3D stacks of mouse brain tissue to study neural circuit development. This project involves a balance between developing novel methods using for example deep learning approaches, and obtaining biological insight through meaningful measurements. Importantly, he/she would help build an environment where one can conveniently manipulate very large images, integrating visualization software with analysis and data handling.

A successful candidate would hold a PhD in image analysis, data science/machine learning, computational biology, bio(image)-informatics or a related field, and would have experience in some of the following:

- working in interdisciplinary environments
- microscopy/biology
- Image processing/image analysis/computer vision
- Machine learning/'data science'
- Databases/'big data' handling
- Coding in a variety of language (Java and python in particular)

Application: Send CV + cover letter to Anatole Chessel or Emmanuel Beaufrepaire (anatole.chessel@polytechnique.edu, emmanuel.beaufrepaire@polytechnique.edu)

References:

- [1] Mahou et al, 'Multicolor two-photon microscopy by wavelength mixing', Nat Methods 2012.
- [2] Mahou et al, 'Multicolor two-photon light-sheet microscopy', Nat Methods 2014.