Grenoble Institute of Neuroscience, Inserm – UJF
Team 11 Brain Function & Neuromodulation, Dir: O. David

PhD fellowship position

Project title: Function brain tractography (F-TRACT)

Funding body: European Research Council (ERC)
Host institution: Inserm
Contract duration: 3 years
Starting date: Flexible. Applications will be considered until the position is filled.
Gross salary: 1684.93 €/month

Scientific summary:

In patients suffering from focal drug-resistant epilepsy who are explored using intracranial electrodes, single-pulse direct electrical stimulation of a cortical region induces electrophysiological responses in many of the implanted electrodes. The presence, latency and morphological characteristics of these cortico-cortical induced potentials can be used to infer functional and anatomical brain connectivity. Intracerebral electrodes record from a small fraction of the volume of the brain in a single individual, allowing to study only a small fraction of the possible brain connections.

In F-TRACT, we develop methods to analyse those responses in order to create a new probabilistic atlas of electrophysiological functional tractography of the human brain, which will be made freely available to the clinical and neuroscience community. Several thousand stimulation runs performed in several hundred patients will be included in the atlas database to reach a nearly full coverage of the human cortex. Neuroanatomical data (MRI, CT), electrophysiological data (intracranial EEG) and clinical data (*e.g.* epilepsy type, age at surgery, anatomical lesion, epileptogenic region) are confidentially gathered by the F-TRACT project from epilepsy surgery centres worldwide.

This new atlas of functional tractography will be very useful to understand how the brain works and to develop neurocomputational models at a large scale. It will also allow the development of new clinical tools for the presurgical evaluation of intractable epilepsy.

Host research group:

The main goal of the host research group (Brain Function & Neuromodulation, PI: Olivier David) is to study large-scale brain networks in order to develop new applications of brain stimulation in the field of psychiatry, movement disorders and epilepsy using a translational approach based on clinical and preclinical research. Very close interactions between experimentalists, methodologists and clinicians, and a strong dedication of the group to the emergence of young scientists, ensure an optimal environment for PhD students in neuroscience. In addition, the successful candidate will have the opportunity to actively participate to a large-scale multi-centric project.
Grenoble city is located in the French Alps. It offers optimal quality of life for students (rated first in France for many years).

Requested expertise: Computational neuroscience / Image and signal processing / Modelling

Contact: Olivier David, Research Director, Inserm, Olivier.David@inserm.fr. Please send application including CV, statement of research interests, and the names and full contact details of two referees.