

Development of Electrical impedance tomography for ECGI

Postdoctoral Researcher

Context

One of the most promising recent avenues for detecting cardiac rhythm disorders is electrocardiographic imaging (ECGi), currently being studied at the IHU-Liryc. This is a non-invasive imaging technique that reconstructs the electrical activity of the heart from electrical measurements taken on the patient's torso. However uncertainties in the movement of organs and the torso, as well as interpersonal variations in tissue conductivity, play a role in the loss of precision of ECGI. To improve the resolution of the ECGi, it is therefore necessary to propose more complete descriptions of the electrical properties in the volume of the torso, and to enrich the information obtained by the measurements from the body surface. For this, we propose to use Electrical Impedance Tomography (EIT): which is a non-invasive technique for reconstructing internal conductivities, but also shapes. It is an imaging modality currently commonly used for medical purposes but not yet for the detection of cardiac rhythm disorders. The objective of this project is therefore to validate EIT resolution methods on experiments carried out within the IHU-Liryc, in an experimental device that was developed there for the ECGi.

Role Description

This is a full-time on-site role for a Postdoctoral Researcher at IHU LIRYC. The Postdoctoral Researcher will be responsible for conducting laboratory experiments, analyzing data, and contributing to research projects in the field of cardiac electrophysiology. Specifically, they will develop the signal processing pipelines to process raw data, evaluate available EIT methods to determine organ conductivities and position within the torso. The role involves daily engagement with cutting-edge research on cardiac electrical diseases and collaboration with multidisciplinary teams.

Qualifications

- **Laboratory Skills:** Experience in conducting experiments and handling laboratory equipment
- **Research and Data Analysis:** Proficiency in conducting research and analyzing data effectively
- **Physics Knowledge:** Understanding of physics principles related to electrical impedance tomography
- **Computer programming skills** are a requirement (Matlab, Python).
- **Strong quantitative skills and analytical thinking**
- **PhD in a related field** such as Biomedical Engineering, Physiology, or Cardiac Electrophysiology

Applications

To apply please send your CV and motivation letter to Laura Bear (laura.bear@ihu-liryc.fr)