1-YEAR POSTDOC POSITION

Functional ultrasound imaging toward brain-machine interface

Brain-machine interfaces (BMIs) are a highly demanding application for developing innovative technologies for large-scale recording of neural activity. In the framework of a transatlantic collaboration (NIH Grant) between Caltech University, Pasadena, the Institute Physics for Medicine at ESPCI Paris, and Iconeus Paris, we develop and implement the first BMI based on functional ultrasound (fUS)—a recently developed minimally invasive neuroimaging technique combining high spatial and temporal resolution with deep brain coverage (Macé et al. 2011).

Current state-of-the-art BMIs are often invasive, damage living brain tissue which limits their applications in human for long term use. A minimally invasive ultrasonic BMI like fUS opens new avenues for neuroscience research and neuroprosthetics. In this project, we will push the limits of fUS imaging as a technology for large-scale chronic recording of neural activity by developing a fUS-based minimally invasive and volumetric BMI.

This project involves rodents and non-human primates (NHP) proof-of-concept experiments. The candidate will conduct extensive proof-of-concept experiments on awake animals to validate the effectiveness and reliability of the fUS-based BMI in real-world scenarios. The focus will be on experimental validation and refinement of the 3D BMI technology.

SKILLS / EXPERTISE
- Experience in conducting animal experiments, particularly with awake rodents or non-human primates, is beneficial.
- Knowledge in designing and implementing experimental protocols, ideally for fUS imaging, is appreciated.
- Skills in analyzing functional imaging data to optimize BMI performance would be valuable.
- Programming skills in Matlab or Python would be an asset.

WORK ENVIRONMENT
The candidate will work in a renowned lab in Biomedical Ultrasound, focusing on experimental validation and refinement of the fUS-based BMI technology. The role involves conducting experiments, analyzing data, and optimizing the BMI for real-world applications. The lab provides a supportive environment for cutting-edge research and international collaboration.

DURATION & LOCATION
12 months, Paris

CONTACT
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