Institut de Neurociències
Universitat de Barcelona

Oficina principal a
Campus Mundet, Edifici de Ponent

Passeig Vall d'Hebron 171
08035 Barcelona
Tel. +34 933 125 065
www.neurociencies.ub.edu

Laboratory technician

Offer description:
The **Brainlab-Cognitive Neuroscience Research Group** (www.ub.edu/brainlab), of the Institute of Neurosciences of the University of Barcelona (www.neurociencies.ub.edu) is seeking a highly motivated lab technician to implement novel EEG analytical techniques and to support EEG-related research in our lab.

The *Brainlab* is a multidisciplinary research group that uses mainly EEG, but also MEG, fMRI and behavioral and neurogenetic analysis, to investigate the neural mechanisms of auditory cognition. Our research addresses the neural mechanisms by which the auditory system makes sense of sound, essentially by looking at sensory adaptation and prediction error and their interactions with motor and other cognitive systems at multiple hierarchical levels. A major current focus is on the encoding of speech sounds along the auditory hierarchy as revealed by the Frequency-Following Response (FFR), involving a neurogenetic and neurodevelopmental approach.

Through traditional approaches, such as the analysis of amplitude and latencies of specific waveforms (components) of averaged event-related brain potentials (ERPs), as well as of their topographical scalp distribution, we have succeeded in producing remarkable pieces of research (e.g., Escera et al. 1998, *J Cong Neurosci*: 580 WOS citations; Díaz et al. 2008, *Proc Natl Acad Sci*; Costa-Faidella et al., 2011, *J Neurosci*). Also, similar success has been achieved using traditional approaches based on oscillatory components of the continuous EEG (e.g., time-frequency analyses in Garcia-Garcia et al., 2010, *Neuroimage*; entrainment of brain oscillations in Costa-Faidella et al., 2017, *Neuroimage*) and in retrieving frequency-following responses (FFR) elicited to auditory stimulation from the averaged EEG (e.g., Slabu et al., 2012, *J Neurosci*; Selinger et al., 2016, *J Neurosci*). Our current research projects and goals challenge, however, these classical approaches, for example when trying to exploit the plenty of information hidden into the complex spectro-temporal patterns of the EEG recorded during complex task performance or while processing complex naturalistic information. For that, we envisage to implement, among others, the following approaches:

- Hierarchical Linear Modeling (e.g., LIMO EEG)
- Functional Connectivity measures extracted from EEG data
- Multivariate Pattern Analysis
- Neural speech tracking and cortical tracking of running speech
- Electrophysiological and eye-tracking (pupillometry) data coupling

Key responsibilities:
The successful candidate will work under the coordination of the Brainlab's Principal Investigator and under the close supervision of the different Brainlab PIs in the implementation of the specific technical projects. Responsibilities are to ensure the

Institut de Neurociències
UNIVERSITAT DE BARCELONA

EXCELENCIA
MARÍA
DE MAEZTU

appropriate pipelines for data analysis under the different analytical approaches to be implemented, including project documentation and design, writing up the appropriate program scripts, data conditioning protocols, beta-testing, ensuring process and data quality, and supporting researchers in documenting the analytical approaches when writing the methods and results sections for scientific publications. Involvement in designing and communicating specific research studies is also desirable.

Functions and tasks of the position:
- Understanding the nature of research carried out at the Brainlab and the specific technical requirements of each of its projects
- Read relevant scientific and technical reports
- Transform mathematical formulations into computer scripts: writing code
- Debugging and double-checking
- Data processing, conditioning and analysis
- Informing technical results
- Liaise with researchers to transfer the outputs of analytical tools
- Documenting and backing-up implemented procedures
- Discussing with researchers the outcomes of the analyses
- Participating in regular lab meetings and other scientific activities organized by the group
- Any other relevant to the job, as required

Requirements:
Educational level:
Engineering or bioengineering degree at bachelor or masters level

Skills:
Solid background in biosignals analysis
Experience in EEG data analysis, including inverse solutions, time-frequency analysis, brain oscillations, functional connectivity, etc.
Experience in statistical analysis with non-parametric methods
Knowledge of experimental psychology designs and with the methods of cognitive neuroscience
A positive and strong attitude towards teamwork and a major commitment to research

Qualifications:
Programming skills in Matlab, Phyton, C++, etc.
Competent skills in using EEG-analysis packages such as EEGlab, FreeSurfer, Brainstorm, and the like.

Working language:
English

Starting date:
September 1st, 2019

Duration of the contract:
One year, renewable to a second and third (final) year.

Required documents:
1. Application letter, including motivation
2. CV
3. Two academic/professional reference letters

Send your application to:
cescera@ub.edu, Prof. Carles Escera
indicating in the subject: ***Application Brainlab technician***

Deadline: 15/07/2019

Institut de Neurociències
UNIVERSITAT DE BARCELONA

EXCELENCIA
MARÍA
DE MAEZTU