



Offer #2024-07923

Post-Doctoral Research Visit F/M Post-doc offer: Noise and Variability-free Motor Brain-Computer Interfaces

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

Level of experience : Recently graduated

Context

While Brain-Computer Interfaces (BCI) are promising for many applications, e.g., assistive technologies, human-machine teaming or motor rehabilitation, they are barely used out-of-the-lab due to a poor reliability. Electroencephalographic (EEG) brain signals are indeed very noisy and variable, both between and within users. To address these issues, the French-German Inria-DFKI project NEARBY (« Noise and Variability-free BCI Systems for Out-of-the-lab Use ») proposes to join [Inria](#) and [DFKI](#) forces to build large-scale multi-centric and open EEG-BCI databases, with controlled noise and variability sources, for BCIs based on motor and speech activity. Building on this data we will then design new Artificial Intelligence algorithms, notably based on Deep Learning (but not only), dedicated to EEG denoising and variability-robust EEG-decoding.

Benefits :

- Work with a dedicated EEG engineer to help running numerous experiments and implement the protocols
- An international collaborative project between France and Germany, with scientific visits planned in Germany
- Work as part of the Potioc research team of Inria in Bordeaux, an internationally-renown research group dedicated to Brain-Computer Interface Research
- A high quality academic supervision, both in terms of scientific level (F. Lotte is laureate of both the [USERN prize 2022](#) and the [Lovelace Babbage prize 2023](#) from the French academy of science and the French computer science society) and in terms of mentoring (F. Lotte is laureate of the [Nature award for mentoring in science 2023](#))
- Work in a friendly, dynamic and interdisciplinary research environment
- A modern and state-of-the-art [research institute](#)
- Working in the Bordeaux area, a beautiful city listed as [UNESCO world heritage](#)

Main activities

As part of this project, the goal of this Post-doc project is first to contribute to the setup, running and analyses of a motor imagery EEG-based BCI experiment, with various controlled sources of noise and variability. This work will be made in collaboration with an Inria EEG engineer who will help the post-doc to implement and run the study (and notably help to collect the data). Once the data base collected, the goal of the post-doc would be to design BCI machine learning algorithms (notably Deep Learning algorithms, but not only, Riemannian geometry and reservoir computing classifiers will also be explored) specifically able to deal with the (known) noise and variability sources affecting BCI, thanks to the new and unique data base created.

Skills

- Experience with ElectroEncephaloGraphy (EEG) and/or BCI experiments
- Ability to speak, write and work in an English speaking environment
- Skills in neuroscience, psychology, cognitive science is a plus

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Remuneration

2788€ / month (before taxes)

General Information

- **Theme/Domain** : Interaction and visualization
Instrumentation et expérimentation (BAP C)
- **Town/city** : Talence
- **Inria Center** : [Centre Inria de l'université de Bordeaux](#)
- **Starting date** : 2024-10-01
- **Duration of contract** : 2 years
- **Deadline to apply** : 2024-11-30

Contacts

- **Inria Team** : [POTIOC](#) (DGD-S)
- **Recruiter** :
Lotte Fabien / Fabien.Lotte@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

The keys to success

- BCI/EEG experimental protocol design and running
- Modeling, statistical analysis and tools
- Knowledge of BCI/EEG Machine Learning tools (Deep Learning, Riemannian geometry and/or reservoir computing)

Warning : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

Instruction to apply

Thank you to send:

- CV
- Cover letter
- Support letters (mandatory)
- List of publication

Defence Security :

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.