

2021-03964 - Post-Doctoral Research Visit F/M Federated Statistical Learning for New Generation Meta-Analyses of Large-scale and Secured Biomedical Data (Fed-BioMED)

Renewable contract : Oui

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

Level of experience : Up to 3 years

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 34 research teams as well as 7 support departments. The center's staff (about 500 people including 320 Inria employees) is made up of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrative staff. 1/3 of the staff are civil servants, the others are contractual agents. The majority of the center's research teams are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Four teams are based in Montpellier and two teams are hosted in Bologna in Italy and Athens. The Center is a founding member of Université Côte d'Azur and partner of the I-site MUSE supported by the University of Montpellier.

Context

FED-BioMED focuses on methodological, technical, and translational advances towards the development of a novel generation of federated learning methods for the analysis of private and large-scale multi-centric biomedical data.

Assignment

The project has a specific focus on the efficient federation of frameworks robust to data heterogeneity and uncertainty, and tackles the following scientific challenges:

- Methodological. Extending the federated paradigm to novel scalable approaches to probabilistic modeling and prediction from siloed data.
- Technical. Developing our federated learning framework through a self-contained system that can be securely deployed across different centers and collaborators (fedbiomed.gitlabpages.inria.fr).
- Translational. Demonstrating federated learning on two applications: 1) Discovering novel genetic underpinnings of neurological and psychiatric disorders, and 2) Predictive modeling of sudden cardiac death from multi-centric imaging and clinical information.

Main activities

During the project the candidate will:

- Develop learning methods for federated analysis for private and distributed data;
- Develop a formalism for federated learning in Bayesian non-parametric modeling;
- Deploy advanced statistical learning methods into a wide range of biomedical/clinical applications;
- Interact with INRIA students and researchers, and participate to the scientific life of the group;

Skills

Demonstrable experience in some of the following topics (the more the better):

- Statistics, Bayesian Modeling;
- Optimization, Distributed Computing;
- Python and PyTorch/TensorFlow;
- Biomedical Data Analysis;
- Signal Processing;

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) 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

Gross Salary: 2653 € per month

General Information

- **Theme/Domain** : Optimization, machine learning and statistical methods
Biologie et santé, Sciences de la vie et de la terre (BAP A)
- **Town/city** : Sophia Antipolis
- **Inria Center** : **CRI Sophia Antipolis - Méditerranée**
- **Starting date** : 2021-10-01
- **Duration of contract** : 1 year, 6 months
- **Deadline to apply** : 2021-12-31

Contacts

- **Inria Team** : **EPIONE**
- **Recruiter** :
Lorenzi Marco / Marco.Lorenzi@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

Strong ability to work in a multidisciplinary environment is necessary, as well as communication skills and motivation in taking responsibilities (e.g. supervision, organization of scientific events)

Instruction to apply

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.

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.