

2021-03898 - Engineer on private and decentralized machine learning for medicine (H/F)

Contract type : Civil Servants Mobility (EU) or Fixed-term contract

Renewable contract : Oui

Level of qualifications required : Graduate degree or equivalent

Fonction : Temporary scientific engineer

About the research centre or Inria department

The Inria Lille - Nord Europe Research Centre was founded in 2008 and employs a staff of 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Hauts-De-France région, the Inria Lille - Nord Europe Research Centre undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Centre is to develop an internationally renowned centre of excellence with a significant impact on the City of Lille and its surrounding area. It works to achieve this by pursuing a range of ambitious research projects in such fields of computer science as the intelligence of data and adaptive software systems. Building on the synergies between research and industry, Inria is a major contributor to skills and technology transfer in the field of computer science.

Context

The work concerns a project of the INRIA-MAGNET team with the Lille Hospital, in particular the development of an open source library for private and decentralized/federated machine learning and data analysis to conduct multi-centric medical studies across several hospitals.

The activities will include interactions with the members of the Magnet team (researchers and engineers) and with engineers and doctors of the Lille Hospital. The activities can also include travel, e.g., to conferences to demonstrate the developed library and to contribute to the community building effort.

Assignment

- Consolidate and extend the existing library for decentralized and privacy-preserving machine learning developed in the project
- Integrate these developments to the information systems of partners hospitals to enable decentralized medical studies
- Deploy the library in real-world conditions and experiment on synthetic and (benchmark) medical data, analyzing the benefits and the costs compared to a centralized approach.
- Publish open source code and integrate in existing libraries
- Publish scientific results in medical and computer science conferences

Main activities

- Implement federated and privacy-preserving algorithms for machine learning
- Identify appropriate multicentric medical studies that fit the decentralized setting
- Preliminary experiments with medical partners
- Evaluation of results
- Reporting, disseminating and presenting results

Skills

- Programming skills, preferable in Python, C/C++, R, Bash scripting,
- Knowledge of distributed computing frameworks such as gRPC, networks and security protocols
- Interest for machine learning and medical applications. Good understanding of scientific papers on machine learning
- Good communication skills; communication and animation of software development communities, git workflow

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 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

According to profile

General Information

- **Theme/Domain :** Optimization, machine learning and statistical methods
Statistics (Big data) (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** CRI Lille - Nord Europe
- **Starting date :** 2022-01-01
- **Duration of contract :** 12 months
- **Deadline to apply :** 2021-11-10

Contacts

- **Inria Team :** MAGNET
- **Recruiter :**
Bellet Aurelien / aurelien.bellet@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.

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.