



Offer #2024-07171

Post-Doctoral Research Visit F/M Mobile phone data analytics for edge infrastructure deployment

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

The Inria research centre in Lyon is the 9th Inria research centre, formally created in January 2022. It brings together approximately 300 people in 16 research teams and research support services.

Its staff are distributed at this stage on 2 campuses: in Villeurbanne La Doua (Centre / INSA Lyon / UCBL) on the one hand, and Lyon Gerland (ENS de Lyon) on the other.

The Lyon centre is active in the fields of software, distributed and high-performance computing, embedded systems, quantum computing and privacy in the digital world, but also in digital health and computational biology.

Context

A post-doctoral fellowship is available in the Inria Agora team in the Lyon center. This position is funded in the context of the National French PEPR projects on "Networks of the Future" and "Mobility Digitalization". The post-doctoral fellow will collaborate with Dr. Razvan Stanica (<http://perso.citi.insa-lyon.fr/rstanica/>) from the Inria Agora team and with Dr. Aline Viana (<https://pages.saclay.inria.fr/aline.viana/>) from the Inria TRiBE team.

Inria Agora is a joint team with INSA Lyon, one of the most prestigious engineering schools in France. Teaching involvement and student supervision are possible (but not mandatory) at INSA Lyon.

Assignment

Assignments :

The recruited person will conduct research on the topic of mobile data analysis. This is data collected by mobile network operators, covering large areas and populations, with numerous possible application, such as energy-efficient network resource allocation (e.g., 5G/6G), epidemic propagation, transportation system design, user recommendation systems, urban planning in smart cities, or ride-sharing. The candidate will work on uniquely-rich datasets collected by French mobile operators, with the goal of understanding and predicting user mobility and presence. Specific solutions for the deployment of mobile edge computing and networking infrastructure will be designed based on the proposed data analytics.

For a better knowledge of the proposed research subject :

- <https://hal.science/hal-04189562/document>
- <https://inria.hal.science/hal-03299297/document>
- <https://hal.sorbonne-universite.fr/hal-01740816/document>
- <https://inria.hal.science/hal-01514402v1/document>

Responsibilities :

The post-doctoral fellow will design new data analytics solutions and will test them on large mobile networks datasets. The recruited person is expected to write reports and give presentations to academic and industrial partners (mainly network operators). A special attention will be given to the visualization of results and their presentation to stakeholders and the general public.

Steering/Management :

The recruited person will have the possibility to supervise student engineering projects and internships.

Main activities

- Propose new analytical tools and research questions exploiting the mobile phone data. We dispose of uniquely rich datasets, rarely available to the academic community. The recruited person will have a lot of autonomy in exploring new ideas building on these datasets.
- Analysis and forecasting of user attendance peaks. A detailed spatio-temporal analysis will look at

the appearance of peaks in mobile phone data, depending on the hour of the day or the day of the week, for different geographical areas. Forecasting these peaks, using machine learning techniques, will be an important second element.

- Detection of popular mobility paths in urban areas from aggregated mobile phone data. Starting from mobile phone data aggregated at the base station level, the objective is to retrieve the most representative paths of information demand in a target urban area.
- Design and evaluation of mobile edge computing and networking infrastructure. Based on the analytics designed above, the objective is to propose networking solutions at the mobile edge in order to support time-sensitive services.

Skills

The candidates should have a PhD degree on wireless networks or on a data-related topic.

Good personal and project management skills are required to function in this multi-disciplinary multi-team project.

The ability to write and debug (student) code in Python is an important requirement.

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

2788 € gross salary / month

General Information

- **Theme/Domain** : Networks and Telecommunications
System & Networks (BAP E)
- **Town/city** : Villeurbanne
- **Inria Center** : [Centre Inria de Lyon](#)
- **Starting date** : 2024-10-01
- **Duration of contract** : 12 months
- **Deadline to apply** : 2024-06-13

Contacts

- **Inria Team** : [AGORA](#)
- **Recruiter** :
Stanica Razvan / razvan.stanica@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

The ideal candidate has research experience with mobile phone data analysis.

Two other profiles are strongly encouraged to apply:

- Candidates who have a background in data science and are interested in applying their knowledge to the wireless networks field;
- Candidates who already have an excellent understanding of 5G networks and are willing to develop data analytics skills.

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

Applications must be submitted online via the Inria website. Processing of applications submitted via other channels is not guaranteed.

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.