Offer #2025-08743

Post-Doctoral Research Visit F/M Data transmission strategy analysis in a multi-modal mobile network.

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

Created in 2008, the Inria center at the University of Lille employs 360 people, including 305 scientists in 15 research teams. Recognized for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria center at the University of Lille maintains a close relationship with large companies and SMEs. By fostering synergies between researchers and industry, Inria contributes to the transfer of skills and expertise in the field of digital technologies, and provides access to the best of European and international research for the benefit of innovation and businesses, particularly in the region.

For over 10 years, the Inria center at the University of Lille has been at the heart of Lille's university and scientific ecosystem, as well as at the heart of Frenchtech, with a technology showroom based on avenue de Bretagne in Lille, on the EuraTechnologies site of economic excellence dedicated to information and communication technologies (ICT).

Context

As technology advances, we are seeing an increasing number of objects communicating via more and more different communication technologies. These technologies enable objects to self-organise to form a network that evolves with

their mobility, or to connect to a communication infrastructure such as a cellular or wifi network, for example.

The cohabitation of these two types of communication (node-to-node or via an infrastructure) can be useful in places where the infrastructure is unavailable or unreliable, as one mode can take over from another depending on the situation. Decisions on whether or not to transmit information are taken by so-called opportunistic routing protocols.

The literature provides some interesting elements in the field of opportunistic routing. Nevertheless, they have certain limitations that can be partially overcome by introducing the consideration of node mobility types into information transfer decisions. Our previous work has shown that a node is able to determine its mobility type by observing the different networks in its environment.

The main objective of this project is to study the best strategy based on this knowledge of mobility to achieve efficient data transmission in mobile scenarios.

This work will be carried out jointly by Inria's FUN and COATI teams.

Assignment

As part of the Mobidec PEPR's Mobi-Sci Data Factory project, the person recruited will be responsible for studying and quantifying how taking into account the type of mobility of nodes in routing decisions has an impact on data routing performance.

This will involve defining the best routing strategies in different scenarios, identifying the right performance metrics and redundancy requirements.

Main activities

The person recruited will implement different strategies and simulate them on a variety of scenarios extracted from real data sets available to the project, with a focus on ensuring reproducibility. This analysis will be supplemented by modelling of the approach and theoretical analysis.

T0-T3: Literature review and getting started with the existing system

T4-T6: First simulation testbeds, definition of scenarios

T6-T18: Deployment and analysis of strategies, simulation, evaluation

Skills

Technical skills and level required : PhD

Languages : French, English

Relational skills : Kindness, tolerance, involvment

Other valued appreciated : curiosity

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

2788 € monthly gross salary

General Information

- **Theme/Domain :** Networks and Telecommunications
  System & Networks (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** Centre Inria de l'Université de Lille
- **Starting date :** 2025-10-01
- **Duration of contract :** 1 year, 6 months
- **Deadline to apply :** 2025-04-24

Contacts

- **Inria Team :** FUN

- **Recruiter :**
  Mitton Nathalie / Nathalie.Mitton@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

We are looking for a candidate that has a PhD in computer science who is creative in proposing solution solutions and capable of critical analysis of results. We demand the candidate:

- 1) to be curious and interested in new technologies
- 2) to have excellent skills in scripting and programming (e.g., Python, C/C++)
- 3) have knowledge of mobile networks, wireless networks and temporal graphs
- 4) an interest in mathematical analysis, probability and complexity analysis
- 5) to be fluent in spoken and written English with strong communication and presentation skills.
- 6) to be a pleasant team worker (verbal communication, active listening, motivation and commitment)

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

Please send us your CV and cover letter.

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.