



Offer #2021-04138

Post-Doctoral Research Visit F/M Towards a unified energy-efficient MAC layer for multitechnology sensor networks

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 Lille - Nord Europe research centre, created in 2008, has a staff of 320, including 280 scientists in 14 research teams. Recognised for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria Lille - Nord Europe research centre pursues a close relationship with large companies and SMEs. By promoting synergies between researchers and industrialists, Inria participates in the transfer of skills and expertise in digital technologies and provides access to the best European and international research for the benefit of innovation and companies, particularly in the region.

For the past 10 years, the Inria Lille - Nord Europe centre has been located 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

The FUN research group investigates solutions to enhance programmability, adaptability and reachability of FUN (Future Ubiquitous Networks) composed of RFID, wireless sensor and robot networks. The objects that compose FUN are characterized by limited resources, high mobility and high security level in spite of untrusted environment. They communicate in a wireless way. To be operational and efficient, such networks have to follow some self-organizing rules. Indeed, components of FUN have to be able in a distributed and energy-efficient way to discover the network, self(deploy, communicate, self-structure in spite of their hardware constraints while adapting the environment in which they evolve.

The FUN team is looking for a 12-month postdoc on the topic "Towards a unified and eco-energetic MAC layer for multi-technology networks and sensors".

Assignment

This offer is part of a collaboration with the company GoodFlow, the University of Rennes and the Mines Telecom Institute. The objective of the GoodFlow project is to develop a solution for monitoring and managing reusable tertiary packaging that would be positioned as an eco-solution in an industrial environment where disposable packaging is very dominant (>80%). In the industrial packaging sector, the transition from disposable to reusable packaging is slowed down, or even prevented, mainly for reasons of traceability and stock management, which greatly reduces the profitability of the investment. The GoodFlow project aims to remove these barriers by developing an IoT solution, integrating artificial intelligence (AI) embedded in reusable packaging, and a cloud-based software solution for managing flows and alerts (also based on AI).

In this context, the Inria FUN team is in charge of designing the MAC layer of communicating devices. This MAC layer has to be energy efficient and therefore has to mutualise the neighbourhood discovery of each technology and to interact with the AI and radio wake up modules.

Main activities

The postdoc will be in charge of:

- Design a multi-technology MAC layer
- Participate in the ADEME GoodFlow project
- Implement and validate experimentally his/her research results
- Participate in the integration of his/her contributions to the final product

Skills

- Knowledge in wireless networks and security mechanisms
- Knowledge in IoT and MAC layer mechanisms
- Skills in Simulation tools and development
- Skills in C and python

- English speaking
- Autonomy
- Open minded
- Team working
- Capacity to write English reports and papers
- Sense of organization, autonomy, rigor

Benefits package

You will integrate a dynamic team of international scientific experts in the field of IoT (<http://team.inria.fr/fun/>)

You will work on emerging research activities with recognized international IoT actors.

You will work in a stimulating and pleasant work environment (transport participation (50%), on-site catering, teleworking, leave and special leave of absence (45 days), video conference equipment, technical laboratory for experimentation ...)

You can benefit from quality training adapted to your needs and skills, whether technical, methodological or linguistic.

In addition to improving your technical skills, Inria offers you the opportunity to develop your entrepreneurial skills by participating in awareness-raising events and training courses on the creation of start-ups (start-up horizon, intellectual property training, hackAtheq, etc.).
<https://www.inria.fr/fr/inria-startup-studio>

For international candidates, our administrative services will help you with the various administrative procedures (visa, residence permit, social security, housing, bank, etc.)

Remuneration

2 653 € gross salary (before taxes)

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** : 2022-01-01
- **Duration of contract** : 12 months
- **Deadline to apply** : 2021-12-31

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.

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

CV + covering letter + letter(s) of recommendation

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.