



Offer #2024-07911

Multi-Purpose Wireless Platforms for Wireless Networking and Robotic Swarms

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Tempary Research Position

Context

With the proliferation of internet of things (IoT) devices and with recent developments in wireless standards and technology, there is an opportunity for innovation in hardware development to address the shortcomings of networks. One of the recent innovations in the field is the abandonment of the crystal oscillator in wireless transceivers. This work has been adapted in industry by Texas Instruments. However, this device still uses a bulk acoustic wave (BAW) resonator in-package, so while it is a single-package solution, it still requires the integration of multiple chiplets. Prior research suggest that, for simple modulations often associated with IoT standards and communication paradigms, crystals are not necessary and can be replaced with calibration and network feedback. Furthermore, the work that was done on this chip has been the inspiration for the "tapeout course" at the University of California, Berkeley. In this late-undergraduate and earlymaster's-level class, the design and mask layout of the chip itself is the educational instrument through which students learn about the chip design process ranging from initial requirements all the way to final check-off in an advanced deep sub-micrometer technology node.

Assignment

You will have four goals all related to the development and deployment of next-generation wireless communication devices as well as a proposed initiative to educate university students in integrated circuit design and in digital and analog wireless communications.

First, continue to prove that certain radios do not need crystals. This involves both the continuation of work on multi-hop mesh networking without crystals and implementation of a calibration-free crystal-free network.

Second, take the lessons that we have learned about tight radio-processor communication to develop a wireless networking research platform.

Third, leverage the ability for this research platform to tightly integrate a flexible reprogrammable processor with a hardware-reconfigurable radio.

Fourth, leverage both prior research and new developments to use the design of wireless systems-on-chip as an educational tool.

Main activities

You will be part of the AIO team and will have a job very similar to the other permanent researchers:

- define and drive you research program
- regularly published your findings in top-ranked conferences and journals
- build up and manage you subteam

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 (after 12 months of employment)
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

General Information

- **Theme/Domain** : Networks and Telecommunications System & Networks (BAP E)
- **Town/city** : Paris
- **Inria Center** : [Centre Inria de Paris](#)
- **Starting date** : 2024-10-01
- **Duration of contract** : 1 year, 6 months
- **Deadline to apply** : 2024-09-26

Contacts

- **Inria Team** : [AIO](#)
- **Recruiter** :
Watteyne Thomas / thomas.watteyne@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

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.