



Offer #2024-07497

Post-Doctoral Research Visit F/M A Reliability Analysis of Future Decentralized Communications Systems

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 centre at Université Côte d'Azur includes 42 research teams and 9 support services. The centre's staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The teams are mainly located on the university campuses of Sophia Antipolis and Nice as well as Montpellier, in close collaboration with research and higher education laboratories and establishments (Université Côte d'Azur, CNRS, INRAE, INSERM ...), but also with the regional economic players.

With a presence in the fields of computational neuroscience and biology, data science and modeling, software engineering and certification, as well as collaborative robotics, the Inria Centre at Université Côte d'Azur is a major player in terms of scientific excellence through its results and collaborations at both European and international levels.

Context

The Postdoctoral appointment is joint with two INRIA research centers, Centre Inria d'Université Côte d'Azur (Samir M. Perlaza) and Centre Inria de Lyon (Jean-Marie Gorce). The position can be developed in either of these centers within a national collaboration network that includes INSA de Rennes (Philippe Mary).

This position is supported by the French National Agency for Research (ANR) via the project n°ANR-22-PEFT-0010 of the France 2030 program.

Assignment

The appointment is in the broad intersection of information theory, communication theory, and game theory. As part of the national programme France 2030, funded by the French Government, the objective of this position is to study the fundamental limits on the reliability and throughput of decentralized communications systems. The underlying assumption is that independent receivers might broadcast a signal that can be observed by all receivers and thus, used to enhance reliability, throughput, or a convex combination of both. More importantly, transmitters are assumed to use a final constellation and a limited number of channel uses (finite block-length regime).

The research activity is taken over within a strong national cooperation formed around the larger project, namely the PEPR -- Future Networks. The postdoc will participate in national workshops and seminars which are regularly organized within this larger project.

Main activities

The expected results are in the form of fundamental limits, which are essentially information theoretic results (mathematical theorems) on:

- Characterizations of the achievable and unachievable tuples of information rates and probability of error decoding that can be achieved in a multiple access channel thanks to a broadcast signal (a few bits) observed by all transmitters.
- Designs of (short-length) signalling systems in decentralized networks that achieve near optimal trade-offs between information rates and decoding error probability.
- Design of (short-length) codes, compatible with signaling systems, that approach near optimal trade-offs between information rates and decoding error probability with reasonable decoding complexity.

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
- Contribution to mutual insurance (subject to conditions)

Remuneration

Duration: 18 months

Gross Salary: 2788 € per month

General Information

- **Theme/Domain** : Networks and Telecommunications
- **Town/city** : Sophia Antipolis
- **Inria Center** : [Centre Inria d'Université Côte d'Azur](#)
- **Starting date** : 2024-10-01
- **Duration of contract** : 1 year, 6 months
- **Deadline to apply** : 2024-07-12

Contacts

- **Inria Team** : [NEO](#)
- **Recruiter** :
Medina Perlaza Samir / samir.perlaza@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.