2018-00513 - Distributed Caching, Cooperative Transmission, 5G Networks

Level of qualifications required: PhD or equivalent

Fonction: PhD Position

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 37 research teams and 9 support departments. The center's staff (about 600 people including 400 Inria employees) is composed of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrators. 1/3 of the staff are civil servants, the others are contractual. The majority of the research teams at the center are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Six teams are based in Montpellier and a team is hosted by the computer science department of the University of Bologna in Italy. The Center is a member of the University and Institution Community (ComUE) "Université Côte d'Azur (UCA)".

Assignment

The goal of this thesis will be to jointly optimize cooperative caching and cooperative transmission in future 5G networks. A key goal will be to explore the tradeoff between edge caching that reduces backhaul traffic, and caching that improves radio access performance. At the center of this tradeoff lies the question of how caching algorithms can adapt to accommodate potential Coordinated Multi-Point (CoMP) transmission opportunities. A second key goal is to investigate distributed implementations of the proposed optimal solutions, in order to (a) deal with the high complexity of cooperative caching problems, and (b) significantly reduce the amount of additional (signaling) information transmitted over the already congested backhaul links.

The following paper is a preliminary step in this research direction:

Optimal Cache Allocation for Femto Helpers with Joint Transmission Capabilities

Main activities

Research activity.

Skills

We are looking for candidates who are self-motivated and would like to conduct high quality research, and publish in top venues. Candidates should have a Master's Degree (or equivalent) in Electrical Engineering, Computer Science, or a closely related area, preferably with a focus on networking or communications. They are also expected to have very good analytical skills (Probability Theory, Optimization) and some background in the area of Wireless Networking. Good programming skills and experience in popular simulation environments is a plus. A good level of written and spoken English is mandatory (knowledge of French is not required). Finally, the selected candidate will be well organized and able to integrate and work well in groups. The position duration is normally 3 years, with a maximum duration of 4 years.

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
General Information

- **Theme/Domain**: Networks and Telecommunications
  System & Networks (BAP E)
- **Town/city**: Sophia Antipolis
- **Inria Center**: CRI Sophia Antipolis - Méditerranée
- **Starting date**: 2018-04-15
- **Duration of contract**: 3 years
- **Deadline to apply**: 2018-04-12

Contacts

- **Inria Team**: NEO
- **Recruiter**: Neglia Giovanni / giovanni.neglia@inria.fr

Conditions for application

**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.

**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.