
**Level of qualifications required**: PhD or equivalent  
**Function**: Post-Doctoral Research Visit

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**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)”.

**Context**

The work will be carried out at the premises of the Diana team at Inria Sophia Antipolis (south of east of France). The work will profit from collaboration with the partners of the ANR BottleNet and the IPL BetterNet projects.

**Assignment**

A large body of the literature is dedicated to solutions for efficient content caching in the Internet in general and in mobile networks in particular. The main objective is always to reduce the load on the core of the network by bringing popular content as close as possible to the edge of the network and to improve the time to access the content. The second main objective is to transport the content in the most efficient way to on one side fully profit from the available network resources, and on the other side improve as much as possible the service offered to the end users. Mobile edge computing, HTTP/2, adaptive streaming and multi-path TCP are typical examples of these research directions. These different efforts and optimizations have been mostly carried out separately from each other. Furthermore, they aim to optimize network-level or application-level metrics, while ignoring the real metric of interest to the end user which is related to its Quality of Experience. In this proposal we want to bridge the gap between these different efforts and the Quality of Experience. We will leverage recent efforts in terms of Quality of Experience modelling (ref. our project http://project.inria.fr/acqua/ and references therein) and revisit these existing directions from Quality of Experience viewpoint. We are interested in two main issues:

i) what does quality of experience bring to these solutions and how they can be improved to take it into consideration, and  

(ii) what does the joint consideration of these different solutions bring to the user and to the network itself.

The work will follow a data driven approach mixing controlled experiments and machine learning to bridge the gap between caching and transport strategies on one hand, and Quality of Experience on the other hand, and to shed light on the optimal decisions to be taken so as to improve Quality of Experience without impairing network resource usage. The utilization of stochastic tools and nonlinear/linear programming is also envisaged in the course of this research.

**Main activities**

The candidate will have to define the scenarios of the study, identify the existing solutions that interact most with Quality of Experience and that can be improved further by QoE consideration. Next, the candidate will work on the evaluation of the impact of these solutions on the Quality of Experience, and propose directions for how to improve this latter one by revisiting existing caching and transport solutions, either individually or jointly.

The work is expected to follow a data-driven approach with controlled experimental to produce the relevant data. The formulation of the problem using stochastic calculation and its fitting within an optimization framework is also envisaged (where models obtained from data can be used either as objective functions or constraints).

**Skills**

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**General Information**

- **Theme/Domain**: Networks and Telecommunications  
- **System & Networks (BAP E)**  
- **Inria Center**: CRI Sophia Antipolis - Méditerranée  
- **Starting date**: 11/1/18  
- **Duration of contract**: 1 year, 4 months  
- **Deadline to apply**: 3/25/18

**Contacts**

- **Inria Team**: DIANA  
- **Receruteur**: Barakat Chadi / chadi.barakat@inria.fr

**Conditions for application**

Application file: Applications must be submitted online on the Inria website. Collecting applications by other channels is not guaranteed.

Before to apply, and preferably before march 20, it is strongly recommended to contact the scientific in charge of this offer.

**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.
Technical skills and level required: Strong knowledge in network protocols and data analysis. Experience in stochastic analysis and optimization is a plus.

Languages: English.

Relational skills: Capability to work in group and collaborate with other researchers.

Other valued appreciated: Machine Learning, network experimentation, stochastic modeling, optimization.

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

Remuneration

Gross Salary: 2650 brutto per month