
PhD Position (M/F) in Wireless Communications Networks

(Ref : ERC_PhD1_CS_PE_Jan_2017)

Research topics	Wireless Communication Networks, Caching
Department	Communication Systems
Parution date	03/2/2017
Start date	1 st -2 nd Trimester of 2017
Duration	Duration of the thesis
Description	<p>The key scientific challenge which is to pursue the mathematical convergence between feedback-information-theory and preemptive distributed data-storage, and to then design ultra-fast memory-aided communication algorithms, that pass a battery of tests for real-life validation.</p> <p>First, fundamental limits of memory-aided wireless communications will be explored so that the relationship between feedback information and storage-capacity can be better understood. This will lead to the design of specific algorithms that will focus, for example, on “feedback-boosted coded caching” or memory-aided interference alignment. A third important step will be about the use of memory to simplify the structure of wireless networks; it turns out that a bit of feedback-aided caching can fundamentally alter the structure of the network into something much simpler. All these results will then be able to lead to a unified theory stating how memory can be converted into throughput in the case of very large networks such as ultra-high frequency networks, optical networks or the cloud.</p> <p>Interdisciplinary research in the general area of wireless communication networks, with emphasis in cache-aided multiuser interference-limited networks of the future, with subtopics potentially including:</p> <ul style="list-style-type: none">• Cache-aided cooperation in networks• Information theoretic bounds of coded caching• Stochastic network optimization in the presence of caching• Dynamic programming and machine learning for cache-aided networks <p>Additional advantages:</p> <ul style="list-style-type: none">- Competitive salary (PhD students receive approximately 2000 euros) and strong social benefits.- Funding supports joint collaboration and travel to Yale University, USA and TU Berlin.<ul style="list-style-type: none">- Frontier research: "European Research Council (ERC) grants support frontier research. The ERC encourages in particular proposals that cross disciplinary boundaries, pioneering ideas that address new and emerging fields and applications that introduce unconventional, innovative approaches."
Requirements	Applicants for a PhD position (3 years) must have an MSc, and must have a good background in the mathematics of telecommunications, and some background in information theory. They must be fluent in English (writing and speaking).
Application	Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference : ERC_PhD1_CS_PE_Jan_2017



Postal address CS 50193 - 06904 Sophia Antipolis, France

Contact Prof. Petros Elia elia@eurecom.fr

Fax number +33 4 93 00 82 00

EURECOM is a French graduate school and a research center in communication systems based in the international science park of Sophia Antipolis, which brings together renowned universities such as Télécom ParisTech, Aalto University (Helsinki), Politecnico di Torino, Technische Universität München (TUM), Norwegian University of Science and Technology (NTNU), Chalmers University (Sweden) and Czech Technical University in Prague (CTU). The Principality of Monaco is a new institutional member. The Institut Mines-Télécom is EURECOM's founding member.

EURECOM benefits from a strong interaction with the industry through its specific administrative structure: Economic Interest Group (kind of consortium), which brings together international companies such as: Orange, ST Microelectronics, BMW Group Research & Technology, Symantec, Monaco Telecom, SAP, IABG.

EURECOM deploys its expertise around three major fields: Security, Data Science and Mobile Communications. EURECOM is particularly active in research in its areas of excellence while also training a large number of doctoral candidates. Its contractual research is recognized across Europe and contributes largely to its budget.

Thanks to its strong ties set up with the industry, EURECOM was awarded the "Institut Carnot" label jointly with the Institut Telecom right from 2006. The Carnot Label was designed to develop and professionalize cooperative research. It encourages the realization of research projects in public research centers that work together with socioeconomic actors, especially companies.