

PhD Position in Statistical Signal Processing

Eurecom, Mobile Communications Dept.
2229 Route des Crêtes BP 193, F-06904 Sophia Antipolis Cedex, France

LARGE STATISTICAL SYSTEMS ANALYSIS FOR SIGNAL PROCESSING AND WIRELESS COMMUNICATIONS

Department: Mobile Communications Dept.
URL : <http://www.eurecom.fr/cm/welcome.en.htm>
Start Date: October 2008 or to be negotiated.
Duration: Three years
Description: In wireless communications, as in various other signal processing environments, the need for new signal processing algorithms able to perform estimation of a number of parameters that is relatively large with respect to the amount of data available for their estimation becomes more and more urgent. This entails the use of completely new theoretical frameworks with respect to Classical Statistical Analysis. The range of applications is extremely broad and varies from multiple antenna MIMO technology to opportunistic communications or cognitive radio (blind channel estimation) in wireless communications, to blind dereverberation in audio. The successful applicant will work in a multidisciplinary project aiming at developing and analysing new estimators. The new algorithms will be based on large matrix theory and will improve the performance of standard algorithms for large wireless networks where the dimension of the parameter space is comparable with the sample size. Indeed, one approach to the problem of relatively little data for a certain number of parameters to estimate is to let both the amount of data and the number of parameters become large, at a constant ratio. The candidate will investigate estimation problems for large classes of linear system models when the linear model is unknown (nuisance) and time-varying in a time scale of the same order of the parameters to be estimated. Many problems in signal processing can be analyzed more simply in the frequency domain. However, finite sample effects such as windowing intervene and need to be analyzed for large window lengths.
This position offers a unique possibility to develop a broad knowledge on both innovative and very hot topics of wireless communications and signal processing and fundamental theoretical topics in statistics in a very dynamic and cooperative environment. Besides deep understanding of communications, signal processing, and statistics, the candidate will acquire strong skills in powerful analytical tools like random matrix theory, free probability, and replica methods.

Requirements: We are looking for a highly motivated person with a master degree in mathematics, physics, electrical engineering (signal processing or communications engineering) with strong mathematical and communication skills, keen to operate in a multidisciplinary team.

Please submit: CV, 2-3 letters of reference, one page statement of research interests and motivations.
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