In Favour of Posting

THE CHINESE UNIVERSITY OF HONG KONG

Short Courses

Jointly presented by Computer Science & Engineering Dept
and Information Engineering Dept

Stochastic Geometry and Information Theory

by

Professor Francois Baccelli

INRIA-ENS

Dates & Time : 1st lecture: 11 July, 2011 (Mon.) 11:00am-12:00noon
2nd lecture: 13 July, 2011 (Wed.) 11:00am-12:00noon
3rd lecture: 15 July, 2011 (Fri.) 11:00am-12:00noon

Venue : Room 1009 William M.W. Mong Engineering Building
The Chinese University of Hong Kong

Abstract

This series of three talks will give a survey of recent results on the inter-play between stochastic geometry and information theory.

The first two lectures will show that stochastic geometry in the Euclidean plane provides a natural way of defining and computing macroscopic properties of large wireless networks whose links are defined through classical channels of information theory. These macroscopic properties are obtained by some averaging over all patterns found in a network where nodes are randomly located in the Euclidean plane. We will discuss the implications of this viewpoint in wireless network modeling and design. The first lecture will mainly focus on medium access protocol modeling and the second one on the analysis of routing protocols.

The third lecture will revisit some of the most basic questions of information theory, namely capacity and error exponents, in terms of random geometric objects living in Euclidean spaces with dimensions tending to infinity. We will for instance show that this approach allows one to use the theory of large deviations to evaluate random coding error exponents in channels with additive stationary and ergodic noise.

The first two lectures will be based on "Stochastic Geometry and Wireless Networks"

Volume I (Theory), file FnT1.pdf:
http://hal.inria.fr/inria-00403039

Volume II (Applications), file FnT2.pdf:
http://hal.inria.fr/inria-00403040

The third one on http://arxiv.org/abs/1012.4924

Biography

Francois Baccelli's general research interests are in the theory of stochastic networks and in the modeling and performance evaluation of computer and communication systems.

He coauthored research monographs on the following topics: point processes (with P. Bremaud in 87), the max plus algebra (with G. Cohen, G.J. Olsder and J.P. Quadrat in 1992), queueing theory (with P. Bremaud in 1994) and stochastic geometry for wireless networks (with B. Blaszczyszyn in 2009).

His current research interest are focused on the analysis of large IP networks and on the development of new tools for the modeling of protocols with spatial components in wireless networks.

He was the head of the modeling and performance evaluation research group of INRIA Sophia Antipolis, France, from its creation to 1999. He was a partner in several European projects including IMSE (Esprit 2) and ALAPEDES (TMR), and was the coordinator of the Qmips project (Basic Research Action).

He is currently INRIA Directeur de Recherche in the Computer Science Department of Ecole Normale Superieure in Paris, where he started the research group on the theory of communication networks in 1999.

F. Baccelli was awarded the 2002 France Telecom Prize by the French Academy of Sciences. He also got IBM academic awards in 2003 and in 2004. He became a member of the French Academy of Sciences in 2005.

**** ALL ARE WELCOME ****

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