Title: **On System-Level Analysis & Design of Cellular Networks: The Magic of Stochastic Geometry**

Speaker: Dr. Marco Di Renzo
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URL: http://www.comsoc.org/distinguished-lecturer/distinguished-lecturer-marco-di-renzo

Time: 10:30-12:00, Thursday, August 3, 2017

Location: E417 Seminar room, B4 Building
1-1 Gakuen-cho, Nakaku, Sakai, Osaka 599-8531, Japan
http://www.osakafu-u.ac.jp/osakafu-content/uploads/sites/344/nakamozu_map3d_20150701.pdf

Abstract: This talk is aimed to provide a comprehensive crash course on the critical and essential importance of spatial models for an accurate system-level analysis and optimization of emerging 5G ultra-dense and heterogeneous cellular networks. Due to the increased heterogeneity and deployment density, new flexible and scalable approaches for modeling, simulating, analyzing and optimizing cellular networks are needed. Recently, a new approach has been proposed: it is based on the theory of point processes and it leverages tools from stochastic geometry for tractable system-level modeling, performance evaluation and optimization. The potential of stochastic geometry for modeling and analyzing cellular networks will be investigated for application to several emerging case studies, including massive MIMO, mmWave communication, and wireless power transfer. In addition, the accuracy of this emerging abstraction for modeling cellular networks will be experimentally validated by using base station locations and building footprints from two publicly available databases in the United Kingdom (OFCOM and Ordnance Survey). This topic is highly relevant to graduate students and researchers from academia and industry, who are highly interested in understanding the potential of a variety of candidate communication technologies for 5G networks.

Speaker Biography: Marco Di Renzo received the "Laurea" and Ph.D. degrees in Electrical and Information Engineering from the University of L'Aquila, Italy, in 2003 and 2007, respectively. In October 2013, he received the Doctor of Science degree from the University Paris-Sud, France. Since 2010, he has been a "Charge de Recherche Titulaire" CNRS (CNRS Associate Professor) in the Laboratory of Signals and Systems of Paris-Saclay University - CNRS, CentraleSupelec, Univ Paris Sud, France. He is an Adjunct Professor at the University of Technology Sydney, Australia, a Visiting Professor at the University of L'Aquila, Italy, and a co-founder of the university spin-off company WEST Aquila s.r.l., Italy. He serves as an Editor of IEEE COMMUNICATIONS LETTERS, IEEE TRANSACTIONS ON COMMUNICATIONS, and IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS. He is a Distinguished Lecturer of the IEEE Vehicular Technology Society and IEEE Communications Society. He is a recipient of several awards, and a frequent tutorial and invited speaker at IEEE conferences.