

IEEE VTS Distinguished Lecture

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Title

On System-Level Analysis & Design of Cellular Networks: The Magic of Stochastic Geometry (from modeling to experimental validation)

Speaker

A/Prof. Marco Di Renzo, IEEE VTS Distinguished Lecturer, Paris-Saclay University

Time / Date: 10:00-11:00am / Tuesday, 11 October 2016

Location: Seminar room 11.06.408, Level 6, Building 11
University of Technology Sydney (UTS)
Corner of Jones St and Broadway, Ultimo

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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 Bio



Marco Di Renzo, CNRS Associate Professor
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Marco Di Renzo received the Laurea (cum laude) and the Ph.D. degrees in electrical engineering from the University of L'Aquila, L'Aquila, Italy, in 2003 and in 2007, respectively, and the Habilitation à Diriger des Recherches (Doctor of Science) degree from University Paris-Sud, France, in 2013. He has held research and academic positions in Italy at the University of L'Aquila, in the United States at Virginia Tech, in Spain at CTTC, and in the United Kingdom at The University of Edinburgh. Since 2010, he has been a CNRS Associate Professor ("Chargé de Recherche Titulaire CNRS") in the Laboratory of Signals and Systems of Paris-Saclay University—CNRS, CentraleSupélec, University Paris Sud, France. He is a Distinguished Visiting Fellow of the Royal Academy of Engineering, U.K. He is a co-founder of the university spin-off company WEST Aquila s.r.l. Italy. He is a recipient of several awards, including Best Paper Awards at IEEE CAMAD (2012 and 2014), IEEE-VTCfall (2013), IEEE-ATC (2014), IEEE ComManTel (2015), the 2013 Network of Excellence NEWCOM# Best Paper Award, the 2013 IEEE-COMSOC Best Young Researcher Award for Europe, Middle East and Africa (EMEA Region), the 2015 IEEE Jack Neubauer Memorial Best System Paper Award, and the 2015-2018 CNRS Award for Excellence in Research and in Advising Doctoral Students. Currently, he serves as an Editor of the IEEE COMMUNICATIONS LETTERS and IEEE TRANSACTIONS ON COMMUNICATIONS, where is the Editor for Heterogeneous Networks Modeling and Analysis of the IEEE Communications Society. He is a Senior Member of the IEEE (COMSOC and VTS) and a Member of the European Association for Communications and Networking (EURACON). He is a Distinguished Lecturer of the IEEE Vehicular Technology Society. He is the Project Coordinator of the H2020 projects ITN-5Gwireless and ITN-5Gaura and he is or has been a Principal Investigator of the EU-funded projects ITN-GREENET, ITN-CROSSFIRE, IAPP-WSN4QoL, IAPP-SmartNRG, RICE-CASPER, and of the ANR-funded (French Science Foundation) project SpatialModulation. He is the representative for CNRS and Paris-Saclay University of the COST Action IRACON.