

Wireless Seminar – Carleton University

Network Geometry through Planar Distribution Modeling: An Alternate Analytical Toolkit to Traditional Point Process Techniques

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- Date: Friday, Jan.23, 2015
- Time: 1:30-3:30pm EST
- Location: Carleton University, Dept. of Systems and Computer Eng., Mackenzie Building, Room: 4346

Abstract:

The United Nations ITU has recently reported that the number of mobile users is expected to surpass the world population. With this growth, many communication engineering challenges are anticipated for 5G systems. While 5G applications are expected to be diverse, the network architectures and devices need to deliver reliable, pervasive, and high-speed interconnection for various data-intensive applications. These requirements must be accomplished while necessitating limited resources for a continuously expanding consumer demographics. Thus, deploying such complex networks is a formidable engineering feat that requires novel ways for modeling, evaluating, analyzing and designing extremely dense radio systems. The objective of this talk would be to explain this challenge through the prism of *network geometry*. Therefore, a brief overview of random spatial geometry for communication systems will be given. We will also present a structured characterization for the modeling and generation of spatial networks and attempt to articulate some of the technical differences between traditional point process techniques and planar distributions. The rest of the talk will primarily focus on various research advances for network modeling based on planar distribution techniques. Topics related to channel-loss behavior for cellular-based random users, and the development of various inhomogeneous spatial deployment algorithms will be discussed. Finally, we will highlight some exciting open challenges that are worthy of immediate attention from the research community.

Bio. Sketch:

Mouhamed Abdulla received, respectively in 2003, 2006, and 2012, a B.Eng. (with Distinction) in Electrical Eng., an M.Eng. in Aerospace Eng. and a Ph.D. in Electrical Eng. all at Concordia U. He is currently an NSERC Postdoctoral Fellow with the Dept. of Electrical Eng. of the U. of Québec. Previously, he was a researcher with the Wireless Design Lab. of the ECE Dept. of Concordia U. Moreover, for nearly 7 years since 2003, he worked at IBM Canada Ltd. as a Senior Technical Specialist. Dr. Abdulla is an IEEE ExCom member of the Montréal Section, where he was the Secretary in 2013, and is presently the Treasurer. He is also the Secretary of IEEE ComSoc and ITSoc societies. Furthermore, he is an Associate Editor of *IEEE Technology News Publication*, *IEEE AURUM Newsletter*; and Editor of *Elsevier Digital Communications and Networks*, *Journal of Next Generation Information Technology*, and *Advances in Network and Communications Journal*. He regularly serves as a referee for a number of Canadian Granting Agencies and journal publications such as: IEEE, Wiley, Springer, EURASIP, Elsevier, ACM, IET and Hindawi. He is also on the examination writing committee for the *IEEE ComSoc WCET® Certification Program*. Besides, he constantly serves as a TPC member for several IEEE and Springer international conferences. Since 2011, his biography is listed in Marquis Who's Who in the World publication.