Massive Wireless Networks in 5G and Beyond: Spatiotemporal Modeling and Design

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Speaker:

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Abstract:

Massive wireless networks (MWN), constituted of ultra-dense base stations, WiFi access points, sensors, actuators, machines, connected cars, drones, devices, and many other smart objects (things) will significantly contribute to the big data supply and automation of the foreseen smart world. Such information revolution will be realized via massive, ubiquitous, and energy-efficient wireless connectivity within the fifth generation of cellular networks (5G), Internet-of-Things (IoT), and Cyber Physical Systems (CPS). Unleashing the potentials of the upcoming smart world necessitates revolutionary designs and methodologies for wireless networking in order to cope with the unprecedented challenges imposed by the MWN intrinsic characteristics.

In this context, this tutorial presents spatiotemporal mathematical framework, based on stochastic geometry and queueing theory, as a fundamental basis to model, analyze, and design 5G networks and beyond.

Bio:

Dr. Hesham ElSawy has been an Assistant Professor at King Fahd University of Petroleum and Minerals (KFUPM) since August 2018. Prior to that, he was a postdoctoral fellow with the Computer, Electrical, and Mathematical Sciences and Engineering (CEMSE) Division, of the King Abdullah University of Science and technology (KAUST). Dr. ElSawy obtained his Ph.D. degree in Electrical Engineering from the University of Manitoba, Winnipeg, MB Canada, in 2014. His research interests include statistical modeling of wireless networks, stochastic geometry, and queueing analysis for wireless communication networks.