Department of Electrical Engineering
香港城市大學 City University of Hong Kong

Department of Electrical Engineering
Presents a Faculty Candidate Seminar on

Towards 5G and Beyond: Vision and Key Enabling Technologies

by

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Abstract

With the emergence of the 5th generation or 5G mobile networks, we are witnessing an exciting time for wireless communications, which is now gearing up for an unprecedented transformation and a revolutionary leap that will take us to 6G by 2030. 5G and beyond networks will be transformative, which will make future wireless and mobile networks substantially different from previous generations and unleash the full potential of wireless communications in a plethora of thrilling applications, including Internet of Everything, Tactile Internet, and seamless virtual and augmented reality. These applications will continue to drive the need for developing revolutionary technological advances to accommodate the more stringent and challenging requirements such as unlimited wireless connectivity with speeds of up to 1 gigabit per second, ubiquitous always-on global broadband access, and less than 1 msec end-to-end latency. This talk will present the vision of 5G and beyond wireless networks and recent advances in key enabling technologies from three aspects: *intelligent reflecting surface (IRS)-assisted communications* for spectral efficiency enhancement, *millimeter-wave (mm-wave) communications* for gigabit-per-second throughput, and *ultra-dense wireless network analysis* via stochastic geometry. Potential future research directions in 6G systems will also be highlighted.

Biography

Dr. Alex Yu is currently a Research Assistant Professor with the Department of Electronic and Computer Engineering at the Hong Kong University of Science and Technology (HKUST). He received his B.Eng. degree in information engineering from Southeast University, Nanjing, China, in 2014, and his Ph.D. degree in electronic and computer engineering from HKUST, Hong Kong, in 2018. He was an Alexander von Humboldt Post-Doctoral Fellow with the Institute for Digital Communications at Friedrich-Alexander University of Erlangen-Nuremberg (FAU), Erlangen, Germany. He has co-authored the book *Stochastic Geometry Analysis of Multi-Antenna Wireless Networks* (Springer, 2019). His research interests include millimeter-wave communications, intelligent reflecting surface-assisted communications, and artificial intelligence for wireless communications. He received the IEEE Global Communications Conference (GLOBECOM) 2017 Best Paper Award, the 2018 IEEE Signal Processing Society Young Author Best Paper Award, and the IEEE GLOBECOM 2019 Best Paper Award. He was also recognized as an Exemplary Reviewer of IEEE Transactions on Wireless Communications in 2017 and 2018.

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**** ALL ARE WELCOME ****

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