



Electrical and Computer Engineering

Spring 2018 Seminar Series

Paving the Path to 5G & Beyond: Development of Next-Generation Radio Frontend Systems

THURSDAY MARCH 29, 2018

11:00 AM – HEC 450

Next-generation wireless communication systems (5G) will for the first time exploit a vastly extended spectrum up to millimeter wave (mm-wave) with order(s)-of-magnitude elevation of speed, latency, capacity, etc. As a critical infrastructure to support such a revolutionary network, next-generation radio frontend (RFFE) systems will call for ultra-high intrinsic linearity, wide bandwidth, high efficiency and ultimate flexibility. Moreover, integration of RFFE on Silicon together with other functional blocks is also highly desirable, truly enabling the concept of System-On-Chip (SOC). Within the scope of this seminar, I will present my latest research advances on pathfinding of next-generation efficiency enhancement technology of RF power amplifiers, enabling high-efficiency and high-fidelity transmission of wideband ultra-high-data-rate signals. Moreover, mm-wave carrier-aggregation concept will be presented as a key enabler of concurrent access to non-contiguous mm-wave spectra. This clean-slate hardware architecture and cross-layer optimization significantly enhance the channel capacity, spectral efficiency, and access flexibility in mm-wave communications. Besides the advanced circuit architectures, I will introduce a new theoretical framework of power amplification as the backbone for realizing high-performance and highly integrated RFFEs in 5G. Furthermore, this seminar will discuss the possibility of incorporating artificial intelligence into the RF field, which is expected to open exciting new horizons of research potentially leading to disruption of our existing knowledge base.

Kenle Chen University of Rhode Island



Dr. Kenle Chen earned his Ph.D. degree in Electrical Engineering from Purdue University in 2013. He is currently an Assistant Professor with Electrical, Computer, and Biomedical Engineering Department, University of Rhode Island. Prior to his current position, he worked as a Staff RFIC Engineer with Skyworks Solutions from 2015-2017, where he focused on development of RF frontend modules for the emerging Smart-Phone platforms. From 2013 to 2015, he worked as Principal/Lead RFIC Engineer with innovational startups, where he led the Research & Development of multiple successful products of CMOS integrated power amplifiers and frontend solutions for the latest WLAN platforms, e.g., IEEE802.11ac/ax. As a graduate researcher at Purdue University from 2008 to 2013, he made significant contributions in high-efficiency broadband power amplifiers and co-design of reconfigurable RF circuits for smart communication systems.

Dr. Chen was a recipient of 2012 IEEE MTT-S graduate fellowship. He was the winner of the High Efficiency Power Amplifier Design Competition in IEEE MTT-S International Microwave Symposium (IMS) from 2011 to 2012, consecutively. He is an active reviewer for more than 10 international journals including IEEE T-MTT, T-BCAS, T-CAS I/II, MWCL, etc.

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