Interferer-tolerant RF/Millimeter-Wave Receivers in the Age of Ubiquitous Wireless

ABSTRACT
Wireless systems continue to drive and be driven by emerging data and sensing applications across billions of connected devices. Limitations in RF spectrum availability are motivating higher center frequencies at mm-wave, heterogenous cell sizes (macro, pico, femto), opportunistic carrier aggregation and increased spatial spectrum reuse. Wireless receivers must therefore simultaneously provide wide operating frequency, excellent sensitivity and interferer tolerance. In this talk, I will present research in the High-Speed Integrated Circuits Lab at Oregon State University on reconfigurable receivers that provide frequency-domain, code-domain and spatial-domain filtering to reject interferers. The talk will be focused on two extremes of integrated interferer-tolerant receiver design: ultra low-power receivers for pervasive internet-of-things applications and high-performance RF/mm-wave MIMO receivers for 5G and beyond-5G applications.

SPEAKER BIO
Arun Natarajan is an Associate Professor in the School of EECS at Oregon State University. His research is focused on RF and mm-wave integrated circuits and systems for wireless communication and imaging. He received the B.Tech. degree from the Indian Institute of Technology, Madras, in 2001 and the Ph.D. degree from the California Institute of Technology (Caltech), Pasadena, in 2007. From 2007 to 2012, he was a Research Staff Member at IBM T. J. Watson Research Center, NY and worked on mm-wave phased arrays for multi-Gb/s data links and airborne radar. Since joining Oregon State University in 2012, his research group has focused on low-power RFICs and RF/mm-wave arrays integrated in CMOS/SiGe BiCMOS. Natarajan received the DARPA Young Faculty Award in 2017, the National Talent Search Scholarship from the Government of India [1995-2000], the Caltech Atwood Fellowship in 2001, the Analog Devices Outstanding Student IC Designer Award in 2004, the IBM Research Fellowship in 2005, and has served as an Associate Editor for the IEEE Trans. on Microwave Theory and Techniques, Distinguished Lecture for IEEE SSCS and on the Technical Program Committee of IEEE ISSCC and IEEE IMS. He currently serves on the TPC of the IEEE RFIC conference.