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Computer Science Seminar Series

National Capital Region

Cross-technology Communication: Turning wireless interference to interconnection

Speaker: Dr. Song Min Kim
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Friday, December 8, 2017
1:00PM- 2:00PM, NVC T3

Abstract

IoT (Internet of Things) is anticipated to significantly improve the qualities of our daily lives in the areas of home automation, healthcare, and transportation, among many others. This is achieved by massive and diverse wireless devices covering every corner of our living space. This talk introduces intelligent IoT networking via the latest technique of cross-technology communication (CTC) – a new set of designs that establishes direct communication between commercial devices with incompatible wireless physical layers (e.g., WiFi, Bluetooth, and ZigBee), essentially turning interference to interconnection. CTC is a key enabler to achieving pervasive connectivity and distributive exploitation of collaborative opportunities among heterogeneous and specialized networks, to enhance IoT beyond the current practice of isolated operation. The talk will first introduce the basic concept and rationale behind CTC. Then, I will discuss distinct design principles of state-of-the-art CTC; Specifically, low-rate transparent packet-level CTC and the new high-speed physical-layer CTC, followed by their advantages and limitations. Finally, I will present CTC's potential applications/services and their impact to the IoT.

Biography

Song Min Kim is currently an assistant professor in the department of Computer Science, George Mason University. He received Ph.D. from University of Minnesota in 2016, and received BE and ME from Electrical Engineering, Korea University, South Korea. His research interests lie widely across wireless networks, mobile computing, Internet of Things, and Cyber-physical Systems, with an emphasis on IoT low-power and heterogeneous wireless systems. His work has been published in flagship conferences and journals including MobiCom and SenSys, and are under patent for their potential commercialization impact. His research is currently supported by NSF.