University of Rochester
Department of Electrical and Computer Engineering Colloquia

Wireless and Mobile Systems : Changing the Rules of the Game

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Abstract: Mobile and wireless technologies have had a profound impact on the entire world faster than any other technology in the history of mankind. Over the past decade the wireless physical layer has seen rapid innovations e.g. rateless codes, multi-user MIMO and full-duplex communication. These innovations challenge several long-held models and assumptions that have been taken for granted in designing wireless and mobile systems. New wireless technologies such as near field communications and whitespaces bring a completely different set of constraints and requirements. With these exciting developments, it is crucial to revisit existing and long held approaches and notions in wireless system design. In this talk, in order to demonstrate how a single physical layer idea, self-interference cancellation, can lead to radically different approaches in several aspects of wireless system design, I provide two examples. First, Dhwani takes an information theoretic approach to security in near field communication and completely eliminates the need for long standing cryptographic systems. Second, WiFi-Nano is a new wireless MAC design that cuts across PHY and MAC layers in order to improve the long standing CSMA mechanism in WiFi. WiFi-Nano shrinks the CSMA slots by 10x by using a novel mechanism called speculative preamble transmission.

Bio: Krishna Kant Chintalapudi is a researcher in the Mobility, Networks, and Systems group at Microsoft Research India. Prior to joining Microsoft Research he was a Senior Research Engineer at Bosch Research and Technology Center in Palo Alto, CA, USA. He graduated from University of Southern California with a PhD in Computer Science. His research interests broadly lie in the area of wireless networking systems. He has worked on various topics such as wireless sensor networks, hard real time industrial wireless control, indoor localization for mobile phones, PHY-MAC cross-layer design, whitespaces and security in near field communication for mobile phones.

Light refreshments will be provided.