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Computer Science Seminar Series
National Capital Region

Securing Wireless Networks by Exploiting Physical Layer Characteristics

Speaker: Prof. Kai Zeng
George Mason University
### Friday, September 26, 2014
1:00PM- 2:00PM, NVC 207

Abstract

With the rapid advancement of communication and networking technologies, ubiquitous wireless network access and connection has become reality. Due to the "open air" nature of the wireless medium, the resource constraints of the wireless devices, and distributed nature of wireless networks, ensuring wireless network security faces great challenges.

Although traditional cryptography-based mechanisms are widely used for securing wireless networks, there has been an increasing interest in providing or enhancing wireless network security by exploiting various physical layer characteristics. Different from traditional computational-security mechanisms, physical layer security is based on the physical principles of wireless channels and devices, thus provides a fundamentally different approach to secure wireless networks and provides another means of protection at the physical layer. It can be widely applied in various wireless networks for providing different security services. It has a great potential to simplify or avoid complex cryptographic computation and achieve information-theoretical security.

This talk provides an overview of various techniques for securing wireless networks by exploiting physical layer characteristics. Our recent works on extracting shared secret keys from wireless channels and physical layer challenge-response authentication in wireless networks will be presented. Future directions in the physical layer security area and its applications will also be discussed.

Biography
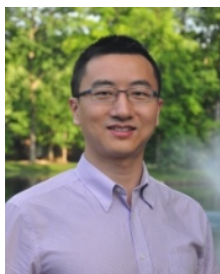
Dr. Kai Zeng is currently an assistant professor in the Department of Electrical and Computer Engineering and is affiliated with the Center for Secure Information Systems at George Mason University. He has broad interests in cyber security and wireless networking with emphasis on physical layer security, cyber physical systems, network forensics, and cognitive radio and mobile network security and privacy.