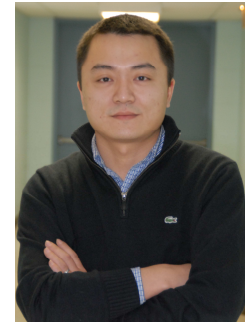## "Secure and Privacy-Preserving Mobile Crowdsourcing for Cooperative Spectrum Sensing"

**Dr. Rui Zhang
Professor
Department of Electrical and
Computer Engineering
Arizona State University
Thursday, April 18th, 2013
Lecture: 3:30 PM – 5:00 PM
Engineering Center
Room EC 3753
10555 West Flagler Street
Miami, FL 33174**

Abstract: The explosive growth of wireless traffic along with limited radio spectrum resources is making Dynamic Spectrum Access (DSA) a key enabler for implementing the FCC National Broadband Plan. By definition, DSA allows unlicensed wireless devices (secondary users) with cognitive radio capabilities to have more flexible and efficient access to the precious radio spectrum without causing interference to licensed wireless devices (primary users). As an essential DSA component, cooperative spectrum sensing enables the accurate identification of transmission opportunities for secondary users. How to effectively and efficiently perform cooperative spectrum sensing over a larger geographic region, however, remains an open challenge.

In addition, a novel secure and privacy-preserving architecture will be introduced for cooperative spectrum sensing through mobile crowdsourcing. In this architecture, a spectrum-sensing provider (SSP) outsources spectrum-sensing tasks to ubiquitous mobile users with increasingly powerful wireless devices and then determines the spectrum availability by combining the collected spectrum-sensing reports. The realization of this promising architecture faces many security and privacy challenges such as the location privacy of involved mobile users and the secure combination of possibly forged spectrum-sensing reports.

Also, the approach of enabling mobile users to conduct cooperative spectrum sensing while protecting their location privacy from the SSP and any other entity will be discussed. In addition, an explanation of the novel secure combination scheme whereby the SSP can make a correct decision about the spectrum availability even when most spectrum-sensing reports it receives are forged will be emphasized in this presentation.

Finally, the author will conclude by highlighting other security and privacy challenges involved in crowdsourcing-based cooperative spectrum sensing as well as my future research plan.

Biography: Rui Zhang is a Ph.D. candidate in the School of Electrical, Computer and Energy Engineering at Arizona State University. He received the B.E. degree in Communication Engineering and M.E. degree in Communication and Information Systems both from Huazhong University of Science and Technology, China. His primary research interests are security and privacy issues in network and distributed systems, including mobile/online social networks, cognitive radio networks, mobile sensing, crowdsourcing, mobile/wireless health, online/mobile cloud computing, smart grids, and wireless ad hoc networks. He has published in journals including IEEE Journal on Selected Areas in Communications, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Wireless Communications, and ACM Wireless Networks, as well as in premier international conferences including MobiHoc, INFOCOM, ICDCS, and IEEE SECON. He has served on the technical program committees of GLOBECOM'2010 and 2011.

Contact: 305-348-2807
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