UCF DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCEINCE

Spring 2015 Seminar Series

Presented by the ECE Division

SPECTRUM CLOUDS: A NOVEL SPECTRUM TRADING SYSTEM FOR MULTI-HOP COGNITIVE RADIO NETWORKS

FRIDAY FEBRUARY 20, 2015

2:00 PM – HEC 450

Smartphone fever leads to a booming growth of various wireless services and a dramatic increase in the demand for radio spectrum. As one of the most promising solutions, cognitive radio (CR) technology releases the spectrum from shackles of authorized licenses, and allows secondary users (SUs) to opportunistically access to the licensed spectrum. Due to the huge economic values of spectrum, CR technology also initiates the spectrum trading market. However, it is challenging to implement spectrum trading in multi-hop cognitive radio networks (CRNs) due to harsh CR requirements on SUs' devices, complex conflict relationship among different CR links, and uncertain spectrum availability. Unlike the existing spectrum trading designs, in this talk, I will introduce a novel CRN architecture for spectrum trading, which can facilitate the accessing of SUs without CR capability and effectively improve the spectrum utilization. As an illustrative example, we will study the optimal session based spectrum trading problem in multi-hop CRNs, where multiple CR sessions compete for the spectrum resources. Given the rate requirements and bidding values of candidate trading sessions, we interpret the CRN into multi-dimensional resource space, characterize the interference among different CR links, formulate the problem with a joint consideration of the uncertain spectrum availability, link scheduling and flow routing, and provide corresponding solutions. Besides, I will briefly discuss my other research efforts on cognitive radio networks, sensor networks, cyber-physical systems, and cybersecurity.

DR. MIAO PAN

Texas Southern University

Dr. Miao Pan is an Assistant Professor in the Department of Computer Science at Texas Southern University. He was a recipient of NSF CAREER Award in 2014. Dr. Pan received Ph.D. degree in Electrical and Computer Engineering from University of Florida in August 2012. Dr. Pan's research interests include cognitive radio networks, cyber-physical systems, and cybersecurity. He has published over 50 papers in prestigious journals including IEEE/ACM Transactions on Networking, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Mobile Computing, and IEEE Transactions on Smart Grid, or in top conferences such as IEEE INFOCOM, ICDCS, and IEEE IPDPS. Dr. Pan serves as a Technical Reviewer for many international journals and conferences. He has also been serving as a Technical Program Committee member of several top international conferences, e.g., IEEE INFOCOM 2014 and 2015. Dr. Pan is a member of IEEE and ACM.