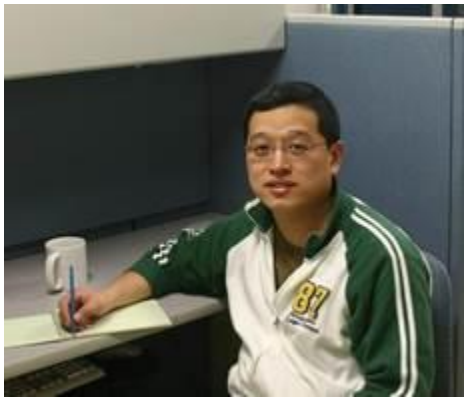
A Knights Welcome To: Zhenghao Zhang



DATE: Friday November 30, 2018

TIME: 3:00PM

LOCATION: R1-307

(Research I Building)

HOSTED BY: Xinwen Fu

Bio: Zhenghao Zhang received his B.Eng. and M.S. degrees in electrical engineering from Zhejiang University, Hangzhou, China, in 1996 and 1999, respectively. He received his Ph.D. degree in electrical engineering from the State University of New York at Stony Brook in 2006. From 1999 to 2001, he worked in industry as an embedded system Software Engineer. From 2006 to 2007, he was a Postdoctoral Researcher in the Computer Science Department at Carnegie Mellon University. He joined the faculty in the Computer Science Department at Florida State University in Fall 2007 and is currently an Associate Professor. He received the NSF CAREER Award in 2012 and the best paper award of IEEE ICC in 2009. His research is mainly in wireless networks, such as Wi-Fi networks, cellular networks, and wireless mesh networks. He and his students have designed and implemented efficient algorithms and protocols that outperform existing solutions, verified by real-world experiments.

"Analog Bloom Filter (ABF) for Wireless Networks"

This talk will focus on the Analog Bloom Filter (ABF) and its application in wireless networks. With ABF, multiple User Equipment (UE) can inform the base station about their intention to initiate data communications simultaneously with little overhead, such as 16 us in a 20 MHz channel. As a result, ABF solves a key problem in the Medium Access Control (MAC) layer, and enables simple and highly efficient network protocols that can be applied to networks with many UEs. The key novelty with ABF is that multiple UEs send their messages simultaneously without any prior coordination, where a message is represented as a small number of selected bases among many bases, such as 8 OFDM subcarriers among 256 subcarriers. With a decoding algorithm based on belief propagation, the base station can find out the identities of UEs with very low error ratio. ABF has been implemented on Microsoft SORA Software Defined Radio, and the results show that it outperforms the existing solutions significantly and can achieve 75% of the physical data rate even under very challenging data traffic conditions.