THE CHINESE UNIVERSITY OF HONG KONG
Institute of Network Coding
and
Department of Information Engineering
Seminar

INC

Smart Mobile Health Systems: Experience with Biological Rhythm Sensing and Wireless Privacy

by

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Date   :   ~~5 October 2016 (Wednesday)~~ **7 October 2016 (Friday)**
Time   :   **11:00am - 12:00pm**
Venue   :   **Room 1009, William M. W. Mong Engineering Building**
             The Chinese University of Hong Kong

Abstract

A key global challenge faced by today's society is to deliver high quality yet economically efficient healthcare solutions. The prominence of mobile technologies holds the promise of fundamentally transforming today's reactive healthcare practice to in-place, proactive care. On the other hand, the widespread of mobile technologies has also led to major concerns on user privacy breach. In this talk, I will describe our recent work on mobile systems for biological rhythm monitoring and Bluetooth sniffing.

Biological rhythms play a central role in maintaining our daily productivity and well-being, and can be found in almost every essential human body function, including sleep/wakefulness, respiration, walking/running, feeding, etc. I will describe two novel mobile systems for personalized, in-place monitoring of important human biological rhythms, including sleep quality and running rhythm. Our approach integrates novel sensing algorithms and psychological/physiological models to achieve high-fidelity monitoring performance on off-the-shelf mobile devices.

In the second part of this talk, I will present our recent work on Bluetooth sniffing. Bluetooth has enjoyed an unprecedented penetration rate in mobile devices. With the prevalence of personal Bluetooth devices, potential breach of user privacy has been an increasing concern. To date, sniffing Bluetooth traffic has been widely considered an extremely intricate task due to Bluetooth's indiscoverable mode, vendor-dependent adaptive hopping behavior, and the interference in the open 2.4 GHz band. I will present BlueEar – the first practical Bluetooth traffic sniffer. BlueEar features a novel dual-radio architecture where two Bluetooth-compliant radios coordinate with each other on learning the hopping sequence of indiscoverable Bluetooth networks.

Last, I will briefly discuss several other projects on Cyber-Physical System (CPS), including real-time volcano monitoring, aquatic monitoring using smartphone-based robotic fish, and data center thermal management.

Biography

Guoliang Xing is currently an Associate Professor of Computer Science and Engineering at Michigan State University. His research interests include mobile health, Cyber-Physical Systems for sustainability, smartphone systems, and wireless networking. He received the B.S. degree from Xi'an Jiao Tong University, China, in 1998, and the M.S. and D.Sc. degrees from Washington University in St. Louis, in 2003 and 2006, respectively. He is an NSF CAREER Award recipient in 2010. He received two Best Paper Awards and five Best Paper Nominations at ICNP, IPSN, PerCom, and SECON conferences. His group has developed several mobile health systems, which won three Best App Awards at MobiCom. He received the Withrow Distinguished Faculty Award from Michigan State University in 2014. He serves as the General Chair for IPSN 2016 and TPC Co-Chair for IPSN 2017.

** ALL ARE WELCOME **

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