UCF DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

# Summer 2015 Seminar Series

Presented by the ECE Division

## CYBERSECURITY FOR INTERNET OF THINGS FROM HARDWARE PERSPECTIVE

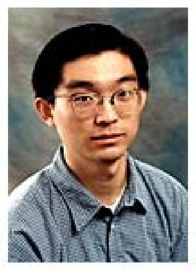
WEDNESDAY JUNE 17, 2015

11:00 AM – HEC 450

With the emerging Internet of Things (IoT), people are connected to each other and the world through many kinds of Internet-enabled “smart” THINGS. However, security and privacy also become serious concerns due to the extreme resource constraints of the IoT devices. In this talk, Dr. Qu will discuss the role of hardware in cybersecurity, particularly for IoT applications. First, he will use the finite state machine (FSM) model to demonstrate that systems built with today's design flow and tools are vulnerable against a simple random walk attack. He further shows that a malicious designer can embed Hardware Trojan Horse into the system to gain unauthorized control of the system. One then describes a practical circuit level technique to guarantee the trustworthiness of the circuit implementation of a given FSM. Second, he describes his recent work on physical unclonable function (PUF), a unique feature embedded in the chip during fabrication process. PUF has many promising applications in security and trust such as device authentication and secret key generation and storage. He will focus on the usability problems of PUF: how to push the amount of PUF information we can extract to the theoretical upper bound; how to ensure that the PUF information is random (and thus secure against attacks); how to improve the hardware efficiency when implementing a PUF. Finally, he will discuss the challenges and opportunities for hardware design in the IoT era

### DR. GANG QU

University of Maryland, College Park



Dr. Qu received his M.S. and Ph.D. degrees from UCLA, both in Computer Science. Dr. Qu is the co-director of the Embedded System Research Laboratory and the Wireless Sensor Laboratory at the University of Maryland. His primary research interests are in the area of embedded systems and VLSI CAD with focus on low power system design and hardware related security and trust. Professor Qu studies optimization and combinatorial problems and applies his theoretical discovery to applications in VLSI CAD, wireless sensor network, bioinformatics, and cybersecurity. Dr. Qu and his research group are sponsored by AFOSR, ARO, DARPA, NSA-LTS, NSF, ONR, USDA, Cisco, Fujitsu Research, and Microsoft Research.

*Hosted by: Dr. Jiann-Shiun Yuan, NSF MIST Center Director*

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4328 Scorpius Street Room 346 Orlando, FL 32816
WWW.EECS.UCF.EDU