



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**Model-based Design and Synthesis of Cyber-Physical
Systems: from Cars to Buildings**

by

Professor Qi Zhu

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Date : 17 August, 2015 (Monday)
Time : 11:00am - 12:00noon
Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

Cars, airplanes, buildings, robots, ..., in many domains, cyber-physical systems have become pervasive, where control tasks implemented in embedded software are deployed onto distributed hardware platforms and closely interact with the physical environment. The design complexity of these systems is growing rapidly due to the increase of their scale, functionality and heterogeneity, as well as more requirements on their real-time performance, reliability, energy consumption, time-to-market and security. To address these challenges, a new set of design automation methods and tools are needed for the modeling, synthesis, and verification of cyber-physical systems.

In this talk, I will present our work on model-based design and synthesis of automotive electronic systems and energy-efficient buildings. I will first introduce our approaches on generating software tasks from functional models and mapping these tasks onto multicore and distributed automotive embedded platforms. These synthesis approaches guarantee functional correctness while addressing a variety of design metrics including real-time performance, fault tolerance, extensibility, modularity, reusability, memory usage, and security. I will then talk about our work on intelligent building energy management and its integration with grid-level optimization.

Biography

Dr. Qi Zhu is an Assistant Professor at the Department of Electrical and Computer Engineering in University of California, Riverside. Prior to joining UCR, Dr. Zhu was a research scientist at the Strategic CAD Labs in Intel from 2008 to 2011. Dr. Zhu received a Ph.D. in EECS from University of California, Berkeley in 2008, and a B.E. in CS from Tsinghua University in 2003. His research interests include model-based design and software synthesis for cyber-physical systems, CPS security, energy-efficient buildings, and system-on-chip design. He received best paper awards at the Design Automation Conference (DAC) 2006, DAC 2007, and International Conference on Cyber-Physical Systems (ICCPs) 2013.

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