

COMPUTER SCIENCE COLLOQUIUM

Low-Power Design from Embedded Computing to Cyber-Physical Systems

SPEAKER Prof Naehyuck CHANG

Professor
School of Electrical Engineering
Korea Advanced Institute of Science and
Engineering (KAIST)
Korea

DATE 19 December 2018 (Wednesday)

TIME 10:30 am - 11:30 am

VENUE CS Seminar Room, Y6405
6th Floor, Yellow Zone
Yeung Kin Man Academic Building
City University of Hong Kong
83 Tat Chee Avenue
Kowloon Tong

ABSTRACT

Power consumption became one of the most critical limiting factors in modern electronics systems design from Internet of Things to high-performance computing systems as the device, and circuit techniques are being matured. By contrast, system-level low-power design avoids the inefficient use of devices and circuits by exploiting the application characteristics and user behaviors. As a result, it provides opportunities to further reduce the total system power consumption beyond the limit of the devices and circuits. Recently, it has been shown that low-power electronics design methodologies can also efficiently reduce power consumption of the physical world, that is, power-aware CPS (cyber-physical systems) design extends the scope of low-power design of electronics systems to physical worlds such as vehicle drivetrain, building HVAC (heat, ventilation and air conditioning), power grid (generation, transmission, and distribution), etc.

Introducing several breakthroughs in cross-layer low-power design that we have developed, this talk demonstrates how we extend the scope of system-level low-power design from embedded computing systems to CPS. In general, physical worlds' power consumption is orders of magnitude higher than that of cyber worlds, and thus low-power CPS indeeds achieves holistic power saving. More specifically, we introduce our targets of low-power design ranging from CPU, memory and interconnects to energy harvesting, energy storage, electric vehicles, and drones. This talk will inspire the current and future low-power CPS with an emphasis on physical worlds within the framework of Design Automation of Things.

BIOGRAPHY

Naehyuck Chang received the B.S., M.S., and Ph.D. degrees from the Department of Control and Instrumentation, Seoul National University, Korea. He was a professor at the Department of Computer Science and Engineering, Seoul National University, from 1997 to 2014. He served as a Vice Dean of the College of Engineering, Seoul National University, from 2011 to 2013. He has been a professor at the Department of Electrical Engineering, Korea Advanced Institute of Science and Technology, Korea, since 2014. His current research interests include low-power systems and Design Automation of Things. He was a recipient of the 2014 International Symposium on Low Power Electronics and Design (ISLPED) Best Paper Award, the 2011 SAE Vincent Bendix Automotive Electronics Engineering Award, the 2011 Sinyang Academic Award, the 2009 IEEE SSCS International SoC Design Conference Seoul Chapter Award, and ISLPED Low-Power Design Contest Awards in 2002, 2003, 2004, 2007, 2012, and 2014. He served as the Chair and Past Chair for ACM Special Interest Group on Design Automation (ACM SIGDA.) He was a TPC Co-Chair of the Design Automation Conference 2016, the Asia and South Pacific Design Automation Conference 2015, the International Conference on Computer Design (ICCD) 2014, the International Conference on Hardware/Software Codesign and System Synthesis 2012, and ISLPED 2009 and the General Co-Chair of VLSI-SoC 2015, ICCD 2015 and 2014, and ISLPED 2011. He is the Editor-in-Chief of the ACM Transactions on Design Automation of Electronics Systems (ACM TODAES.) He serves(ed) as an Associate Editor for the IEEE Transactions on Very Large Scale Integration, the IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, ACM Transactions on Embedded Computing Systems, IEEE Embedded Systems Letters, and IEEE Transactions on Circuits And Systems I. He is currently one of the IEEE Council of Electronics Design Automation (CEDA) Distinguished Lecturers. Naehyuck Chang is a Fellow of ACM (2015) and IEEE (2012.)

All are welcome!



In case of questions, please contact Dr XUE Chun Jason at Tel: 3442 9815, E-mail: jasonxue@cityu.edu.hk, or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/>.