

CS Seminar Series Talk Announcement

Title: Functionality, Performance, and Power Consumption Challenges in Smartphones

Speaker: Sung-Soo Lim , Kookmin University, South Korea

Date: Friday April 12, 11 am - 12 pm

Location: DBH 6011

Abstract:

All the smartphone vendors are significantly competing for newer functionalists and improved performance and power consumption. Architectural advances in CPUs, peripheral components, and software have enabled development of more powerful smart devices with lowered power consumption. The smartphone market competition has driven participating vendors to actively accommodate more complicated and feature-rich software/hardware combinations resulting in increased difficulty in systematic analysis of performance and power consumption. This talk introduces functional and technological trends in recent smartphones and discusses the challenges we currently face to make advances towards the next generation smartphones.

We performed diverse performance and power consumption evaluations for up-to-date versions of Android-based smartphones and the partial results will be shown in this talk. A performance analysis framework considering the whole layers of smartphone software stack has made it possible systematically identifying and reducing performance bottlenecks at both applications and system-levels.

A number of on-going novel approaches in both hardware and software techniques will be introduced: Such techniques include hardware-level virtualization support, paired multi-core feature called big-little architecture from ARM, flash memory file system optimizations, and system-level power consumption management called governor and hot-plugs. A few accomplishments from collaborative projects with a representative smartphone vendor will be shown with preliminary experimental results and the issues and potential subjects for further academia-industry collaborations will be discussed.

Biography

SUNG-SOO LIM received BS, MS, and PhD degrees in Computer Engineering from Seoul National University in 1993, 1995, and 2002, respectively. From 2000 to 2001, he was a visiting researcher in University of Illinois at Urbana-Champaign. From 2001 to 2004, he was the CTO of PalmPalm Technology, Inc. in Korea (a smartphone development company). He is currently an associate professor in School of Computer Science, Kookmin University. His research area includes cyber physical systems, real-time operating systems, real-time performance analysis, low-power technology, and mobile phone architecture.

Host: Eli Bozorgzadeh, Associate Professor, Computer Department