

COMPUTER SCIENCE COLLOQUIUM

Department of Computer Science
City University of Hong Kong

System Architectures for Unified Power Management in Wireless Sensor Networks

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Date :

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Time :

10:45am - 11:45am (Refreshment will be served at 10:30am)

Venue :

CS Seminar Room, Rm Y6405, 6th Floor Yellow Zone, Academic Building,
City University of Hong Kong, Tat Chee Avenue, Kowloon Tong.

Abstract

Power management is a critical concern in wireless sensor networks. Despite significant research in power management protocols, there has been minimal systems support for power management, making it extremely difficult to integrate different power management techniques for diverse applications. This talk will present two recent advances towards unified system architectures for flexible power management in sensor networks. (1) The MAC Layer Architecture (MLA) is a component-based architecture for power-efficient Media Access Control protocol development. MLA consists of optimized, reusable components that implement a common set of features shared by existing MAC protocols, as well as abstractions that encapsulate the intricacies of the hardware platforms they run on. (2) Integrated Concurrency and Energy Management (ICEM) is a device driver architecture that automatically minimizes energy consumption of microprocessors and peripheral devices without requiring explicit information from an application. The key insight behind ICEM is that the most important information an application can provide is the potential concurrency of its I/O. MLA and ICEM have been implemented in TinyOS 2.x, the second generation of the widely used sensor network operating system. Empirical results demonstrated the efficacy and efficiency of unified power management architectures. This talk will also briefly summarize several on-going system projects on structural health monitoring, clinical monitoring, and programming and middleware for flexible sensor network applications.

Biography

Chenyang Lu is an Assistant Professor of Computer Science and Engineering at Washington University in St. Louis. He received the B.S. degree from University of Science and Technology of China in 1995, the M.S. degree from Institute of Software, Chinese Academy of Sciences, in 1997, and the Ph.D. degree from University of Virginia in 2001, all in computer science. He is author and co-author of more than 70 research papers, and held several conference organization positions such as Program Chair of RTAS'08, Sensor Networks Track Chair of RTSS'07, Demo Chair of SenSys'05, and Program Chair of WPDRTS'06 and FeBID'07. He is Associate Editor of ACM Transactions on Sensor Networks and International Journal of Sensor Networks, and Guest Editor of the Special Issue on Real-Time Wireless Sensor Networks of Real-Time Systems Journal. He received an NSF CAREER Award (2005) and a Best Paper Award from International Conference on Distributed Computing in Sensor Systems (2006). His research interests include real-time embedded systems and wireless sensor networks. He is a member of ACM and IEEE.

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*In case of questions, please contact Dr Guoliang Xing at Tel: 2788 7525, E-mail: glxing@cs.cityu.edu.hk,
or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/>.*