

THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**Energy Conservation for Image Retrieval on
Mobile Systems**

by

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The Chinese University of Hong Kong

Abstract

Mobile systems have become major producers of multimedia contents. A smartphone can store thousands of images and this creates the need for better organization and retrieval of images. Content-Based Image Retrieval (CBIR) is a method to retrieve images based on their visual contents, instead of using tags entered by users. CBIR is computation and memory intensive and consumes significant amounts of energy. This study examines energy conservation for CBIR on mobile systems. We present three improvements to save energy: selectively loading image features, adaptively loading features based on overall similarities, and caching features in memory. We further investigate if energy can be saved by migrating parts of the computation to a server. We consider several factors, including wireless data rate, server speed, number of indexed images, and the number of image queries.

Biography

Yung-Hsiang Lu is an associate professor in the School of Electrical and Computer Engineering of Purdue University, U.S.A. He received Ph.D. from Stanford University in 2002. His research focuses on energy conservation and resource management in computer systems, embedded systems, sensor networks, and mobile robots. He received a Career Award from the National Science Foundation in 2004 and the Purdue Class 1922 Helping Student Learn Award in 2008. Between August 2011 and December 2011, he is a visiting associate professor at the Department of Computer Science, National University of Singapore.

Dr. Lu is a senior member of the IEEE and the ACM. He is an associate editor for ACM Transactions on Embedded Computing Systems and ACM Transactions on Design Automation of Electronic Systems. He is chair of Green Multimedia Interest Group, IEEE Multimedia Communication Technical Committee and vice chair of ACM SIGDA Low Power Technical Committee. His paper "Quantitative Comparison of Power Management Algorithms" is selected in the book Design, Automation, and Test in Europe: The Most Influential Papers of 10 Years DATE, Springer, ISBN 9048176530.

**** ALL ARE WELCOME ****

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