Department of Computer Science
University of Houston
Fall 2010 Seminar

WHEN: MONDAY, OCTOBER 18, 2010
WHERE: PGH 232
TIME: 11:00 AM

SPEAKER: Dr. Jun Yang, Nokia Research Center, Palo Alto

Host: Dr. Zhigang Deng

Title: A Continuous Activity Sensing and Recognition System for Mobile Phone Applications

Abstract:
In this talk, we present a novel system that can continuously sense and recognize the physical activities of a person using a mobile phone. The sensor data is collected from built-in accelerometer sensor that measures the motion intensity of the device. The system is aiming at classifying five everyday activities in real time, i.e., stationary, walking, running, bicycling and in vehicle. First we introduce the sensor's data format, sensor calibration, acceleration signal projection, feature extraction and selection methods. Then we have a performance comparison of different choices of feature sets and classifiers. The design and implementation of one prototype system is presented along with resource and performance benchmark on Nokia Symbian platform. Results show high recognition accuracies of recognizing five daily activities. The motion recognition results can be used to design an adaptive location tracking scheme in an energy-efficient way. The last part of the talk demonstrates one mobile wellness application built on top of our system, AutoCal. The talk concludes with some further discussion on a selection of potential applications in the domain of mobile social sharing and contextual user interface.

Bio: Dr. Jun Yang is with Nokia Research Center in Palo Alto as a senior researcher. He is currently working on physical activity and motion gesture recognition by built-in sensors with mobile devices. He also builds prototyping mobile applications that are enabled by the developed continuous activity sensing and recognition engine. Previously he has worked on projects such as rich context mobile framework and social proximity networks. From April 2005 to May 2007, he was a senior member of research staff at Philips Research North America in New York. He participated in several wireless communication and networking projects, such as research and design of next generation high data rate UWB system and cooperative communication systems.

Dr. Yang graduated from University of Southern California in March 2005 with Ph.D. in electrical engineering, majoring in communication sciences. He received M.S. in probability and statistics of mathematics and B. S. in information sciences of mathematics both from Nankai University, TianJin, China, in 1999 and 1996, respectively. His research interests includes mobile sensing technology and application, activity and gesture recognition, mobile social networks and applications, wireless communications and networking, sequence analysis and data compression.