Department of Computer Science

香港城市大學 City University of Hong Kong

COMPUTER SCIENCE SEMINAR SERIES

Department of Computer Science
City University of Hong Kong

Achieving Collaborative Sensing in Wireless Sensor Networks

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Date : 15 September 2009 (Tuesday)

Time : 2:30pm - 3:30pm

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

Abstract

Wireless sensor networks (WSNs) have been increasingly available for mission-critical applications such as security surveillance and environmental monitoring. These applications often impose stringent sensing performance requirements including low false alarm rate, high detection probability and satisfactory timeliness. Although advanced collaborative signal processing algorithms have been adopted by many existing WSNs, most previous theoretical studies on sensing performance are conducted based on overly simplistic sensing models (e.g., the disc model) that neither capture the stochastic nature of sensing nor explicitly exploit the collaboration among multiple sensors. In our recent works, we tried to bridge the gap by investigating the fundamental limits of sensing coverage and detection delay based on collaborative data fusion models that fuse noisy measurements of multiple sensors. The results show that data fusion can significantly improve sensing performance of WSNs by exploiting sensor collaboration. Our results help understand the limitations of the previous analytical results based on the disc model and provide key insights into the design of collaborative WSNs. The results have been published in two papers presented on MobiCom'09 and RTSS'09, respectively.

This paper will be presented in the 15th Annual International Conference on Mobile Computing and Networking (MobiCom 2009), Beijing, China, Sept 20-25, 2009.

Supervisor: Dr Jianping Wang
Research Interest: Data Fusion, Controlled Mobility and Sensing Coverage in Wireless Sensor Networks

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All are welcome!

In case of questions, please contact Dr Jianping Wang at Tel: 2788 7737, E-mail: jianwang@cityu.edu.hk, or visit the CS Departmental Seminar Web at http://www.cs.cityu.edu.hk/.