

COMPUTER SCIENCE SEMINAR SERIES

Department of Computer Science
City University of Hong Kong
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Collaborative Target Detection in Wireless Sensor Networks with Reactive Mobility

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Date :	22 November 2007 (Thursday)
Time :	11:00am - 12:00noon
Venue	CS Seminar Room, Rm Y6405, 6th Floor Yellow Zone, Academic Building, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong.

Abstract

In recent years Wireless Sensor Networks (WSNs) have been deployed in a class of mission-critical applications such as object detection and tracking. These applications have stringent performance requirements such as high detection probability, low system false alarm rate and bounded detection delay, which often require excessive sensor nodes in a large network deployment. Moreover, although dense node deployment can initially achieve the required sensing coverage, it does not adapt to the irregular and unpredictable spatiotemporal distribution of physical phenomenon. This work exploits reactive mobility to improve the target detection performance of WSNs. In our approach, mobile sensors collaborate with static sensors and move reactively to achieve the required detection performance. Specifically, mobile sensors remain stationary and are directed to move toward a possible target only when a detection consensus is reached by a group of sensors. The accuracy of final detection result is then improved as mobile sensors have higher signal-to-noise ratios after the movement. We develop a sensor movement scheduling algorithm that achieves near-optimal system detection performance under a given detection delay bound. The effectiveness of our approach is validated by extensive simulations based on the real data traces collected by the SensIT experiments.

Supervisor: Dr Guoliang Xing (CS)
Research Interests: Target Detection/Classification/Tracking; Wireless Sensor Networks

All are welcome!

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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/>.