SEMINAR

Event Detection Using Sensor Networks

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Abstract
We propose the use of a wireless sensor network (WSN) for detecting the presence of an event source that releases a certain signal or substance in the environment which is then propagated over a large area. The concentration of the substance at the source location is assumed unknown. The sensor nodes are able to measure the substance concentration at their own locations but the measurements are noisy. Based on these concentration readings the sensor nodes have to decide whether they detected the event or not using a local threshold. The determination of this threshold is solved as an optimization problem that minimizes a cost function involving the probability of false alarms and the probability of no detection. The Global Probability of False Alarms and the Global Probability of No Detection for a Wireless Sensor Network are derived analytically in terms of the Local Detection Threshold. The proposed sensor network can deal with a number of environmental monitoring and tracking applications including acoustic source localization, toxic source identification, early detection of fires, and so on.

About the Speaker
Michalis holds a B.S., and a M.S., in electrical engineering from Purdue University, Indiana, USA. Michalis is currently a PhD student in the Electrical and Computer Engineering Department at the University of Cyprus. His research interests are in the area of sensor networks and distributed detection and estimation.

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