

Timing Synchronization and Node Localization in Wireless Sensor Networks

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Abstract:

Wireless sensor networks consist of a large number of sensor nodes, capable of on-board sensing and data processing, that are employed to observe some phenomenon of interest. With their desirable properties of flexible deployment, resistance to harsh environment and lower implementation cost, wireless sensor networks envisage a plethora of applications in diverse areas such as industrial process control, battlefield surveillance, health monitoring, and target localization and tracking.

This presentation will focus on deriving efficient estimators and performance bounds for the clock parameters in wireless sensor networks. Identifying the close connections between the problems of node localization and clock synchronization, we also address in this presentation the problem of joint estimation of an unknown node's location and clock parameters by incorporating the effect of imperfections in node oscillators. A review of the state-of-the-art results and open research problems will be also presented.