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Scheduling Nodes Activity and Data Communication for Target Tracking in Wireless Sensor Networks

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Abstract : In this paper, we consider sensor nodes with the capability of measuring the bearings (relative angle to the target). We use geometric methods to select a set of observer nodes which are responsible for collecting data from the target. Considering the characteristics of target tracking applications, it is clear that significant numbers of sensor nodes are usually inactive. Therefore, in order to minimize the total network energy consumption, a set of sensor nodes, called sentinel, is periodically selected for monitoring, controlling the environment and transmitting data through the network. The other nodes are inactive. Furthermore, the proposed algorithm provides a joint scheduling and routing algorithm to transmit data between network nodes and the fusion center (FC) in which not only provides an efficient way to estimate the target position but also provides an efficient target tracking. Performance evaluation confirms the superiority of the proposed algorithm.

Keywords : coverage, routing, scheduling, target tracking, wireless sensor networks
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