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Article

Improved Energy Based Multi-Sensor Object Detection in Wireless Sensor Networks

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Abstract: Wireless Sensor Networks (WSNs) are spatially distributed to independent sensor networks that can sense physical characteristics such as temperature, sound, pressure, energy, and so on. WSNs have secure link to physical environment and robustness. Data Aggregation (DA) plays a key role in WSN, and it helps to minimize the Energy Consumption (EC). In order to have trustworthy DA with a rate of high aggregation for WSNs, the existing research works have focused on Data Routing for In-Network Aggregation (DRINA). Yet, there is no accomplishment of an effective balance between overhead and routing. But EC required during DA remained unsolved. The detection of objects belonging to the same event into specific regions by the Bayes Node is distributed through the Sensor Nodes (SNs). Multi-Sensor Data Synchronization Scheduling (MSDSS) framework is proposed for efficient DA at the sink in a heterogeneous sensor network. Secure and Energy-Efficient based In-Network Aggregation Sensor Data Routing (SEE-INASDR) is developed based on the Dynamic Routing (DR) structure with reliable data transmission in WSNs. Theoretical analysis and experimental results showed that in WSN, the proposed Bayes Node Energy Polynomial Distribution (BNEPD) technique reduced Energy Drain Rate (EDR) by 39% and reduced 33% of Communication Overhead (CO) using poly distribution algorithm. Similarly, the proposed MSDSS framework increased the Network Lifetime (NL) by 15%. This framework also increased 10.5% of Data Aggregation Routing (DAR). Finally, the SEE-INASDR framework significantly reduced EC by 51% using a Secure and Energy-Efficient Routing Protocol (SEERP).