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International Journal of Innovative Technology and Exploring Engineering
Volume 8, Issue 8, June 2019, Pages 65-75

An improvement approach for reducing transmission power in wireless sensor networks (Article)

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Abstract

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Adoption of Wireless Sensor Networks (WSN) is rising dramatically and a subsequent amount of research has done on WSN power efficiency. Node power consumption reduction is an important part of study in ZigBee WSN, in order to reduce overall WSN power consumption for different applications. One approach is transmission power control for reducing WSN power consumption. In this paper, we present a Transmit Power Control mechanism (TPC), where we use Received Signal Strength Indicator (RSSI) matrix to determine the minimum required level for successful packet delivery utilizing periodically broadcast signals in WSN. We analysis the behavior of the proposed mechanism with respect to different parameter settings such as node position and antenna polarization. A testbed is used for collecting data. After that, we benchmark the result with Non-TPC mechanism. It is observed that the proposed mechanism could provide up to 60% power saving in a specific testbed setup. We also notice that the average transmitting power is inversely proportional with respect to the height of WSN nodes (from 0 meter height). © BEIESP.

Author keywords

Antenna polarization Internet of things Power management Received signal strength indicator Sensor nodes
Transmit power control mechanism Wireless sensor networks ZigBee

ISSN: 22783075

Source Type: Journal

Original language: English

Document Type: Article

Publisher: Blue Eyes Intelligence Engineering and Sciences
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