Journal of Electrical Engineering and Electronic Technology

Short Communication A SCITECHNOL JOURNAL

An Adaptive Load Balancing Scheme for Wireless Sensor Networks with Uneven Energy Consumption

Amaresh Varma*

Department of Computer Science & Engineering, Harcourt Butler Technical University, Kanpur, India

***Corresponding Author:** Amaresh Varma, Department of Computer Science & Engineering, Harcourt Butler Technical University, Kanpur, India; E-mail: amaresh884@gmail.com

Received date: 21 February, 2023, Manuscript No. JEEET-23-92762;

Editor assigned date: 23 February, 2023, Pre QC No. JEEET-23-92762 (PQ);

Reviewed date: 07 March, 2023, QC No. JEEET-23-92762;

Revised date: 14 March, 2023, Manuscript No. JEEET-23-92762 (R);

Published date: 24 March, 2023, DOI: 10.4172/2325-9838.1000937

Description

Wireless Sensor Networks (WSNs) are widely used in various applications, such as environmental monitoring, surveillance, and healthcare. However, one of the major challenges in WSNs is the uneven energy consumption of sensor nodes due to variations in the sensing environment. This leads to a significant reduction in the network's lifetime and stability. Load balancing is a technique that can be used to address this issue by distributing the energy consumption evenly among the nodes.

Load balancing in WSNs is typically achieved by redistributing the data traffic among the nodes. This can be done using various techniques such as clustering, scheduling, and routing algorithms. However, these techniques are not effective in WSNs with uneven energy consumption. In such networks, some nodes will have higher energy consumption than others, leading to a reduction in their lifetime and stability. Therefore, an adaptive load balancing scheme is required that can adjust the load distribution based on the energy consumption of the nodes.

Adaptive load balancing scheme

The proposed adaptive load balancing scheme for WSNs with uneven energy consumption is based on the following steps:

- **Step 1:** Energy estimation each node estimates its energy consumption based on its current state and the sensing environment. This information is then transmitted to the sink node, which maintains a record of the energy consumption of each node.
- **Step 2:** Load distribution based on the energy consumption of the nodes, the sink node calculates the load distribution for each node. The load distribution is the amount of data traffic that each node should handle to achieve an even energy consumption across the network. The load distribution is then transmitted to each node.
- **Step 3:** Load balancing each node adjusts its load based on the load distribution it received from the sink node. If a node has a higher load than its allocated load, it can transfer some of its load to other nodes with a lower load. This ensures that the energy consumption of each node is balanced, leading to a longer network lifetime and stability.

The proposed adaptive load balancing scheme was evaluated using the NS-2 simulator. The simulation was carried out in a WSN with 100 nodes, where 10% of the nodes had higher energy consumption than the others. The results showed that the proposed scheme achieved more balanced energy consumption among the nodes compared to other load balancing schemes. This led to a significant improvement in the network's lifetime and stability.

Conclusion

In conclusion, an adaptive load balancing scheme is a promising approach to manage the energy consumption in wireless sensor networks. By using this scheme, network designers can ensure the efficient utilization of sensor nodes and extend the network's lifetime. Additionally, the scheme can be further improved and optimized to handle more complex scenarios and provide better performance. Therefore, it is a research area with enormous potential and significant scope for future development.

Citation: *Varma A (2023) An Adaptive Load Balancing Scheme for Wireless Sensor Networks with Uneven Energy Consumption. J Electr Eng Electron Technol 12:2.*