

# Congestion Control in Wireless Sensor Network using Artificial Intelligence Techniques



G. Vanitha, P. Amudha, S. Sivakumari

**Abstract:** Now-a-days, wireless sensor network has many issues and challenges like energy-efficient, congestion control, delay, scalability, reliability, robustness, etc. Communication between the wireless sensor nodes requires minimum response delay and congestion. It also requires disclosure to be energy efficient. Many congestion control protocols are using to control the congestion and improve the energy-efficient in that particular problem. Then the WSN protocol is classified as the protocol based, wired, wireless, frequency-based, and it will give the solution to that problem efficiently. Then the artificial intelligence techniques are used in a wireless sensor network to control the congestion in the systems. However, the primary fact is that the sensor node runs out of energy quickly, and traffic (congestion) has issues in many congestion control protocols. Here, congestion control is detects by hierarchical, distribution, energy-efficient in the way of algorithm in a WSN. This paper Present a Survey on Congestion Control in wireless sensor network using artificial intelligence Techniques.

**Keywords:** WSN (Wireless Sensor Network); HEED (Hierarchical Energy-Efficient Distributed), Residual energy, Node degree, Probability.

## I. INTRODUCTION

A sensor network is a physical parameter which is having a sense node like temperature, humidity, and visual and infrared light, pressure, vibration, and chemical sensor, mechanical stress, magnetic sensor. It will determine the speed, magnetic sensors.

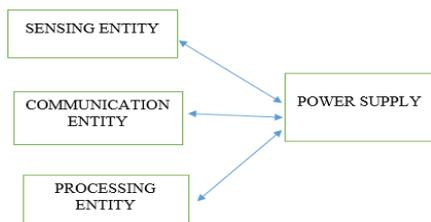


Figure1. Basic Wireless Sensor Architecture

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WSNs are determined the speed or location, and the actuators control the mechanical device. It will simulate the parameter like cost of the node (data), distance of the neighbor node to calculate the delay.

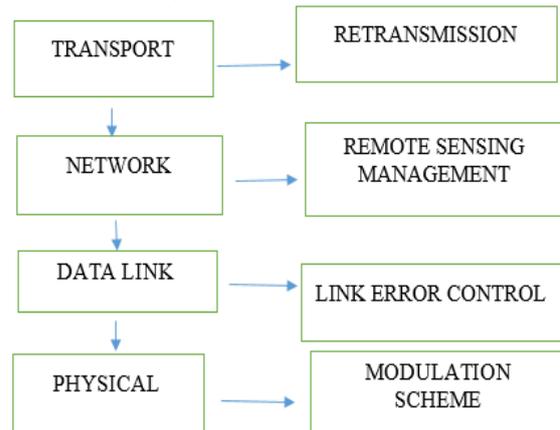


Figure2. Generic Protocol for sensor networks

The upper layer is using to include application processing in application layer, data storage and processing in the layer, and then the fourth layer is used to transport data, is used to transport data function from one layer to another layer if any kind of data is missed during transmission process transport layer is used to retransmission the Process. The third layer is a network layer, which is used to access topological function and manage the process in a every time. The second layer is a data link layer that is using in a channel transfer from one locality to another locality due to particular time. Then finally, it communicates channels, sensing a node, actuation, and signal processing in physical layer.

## A. CONGESTION:

Congestion control is divide into two types, and one is Open-loop congestion control is using to prevent the blockage before it happens. It will control either source or destination. Then it is used as a retransmit the data and acknowledge the data during process. And then the second one is closed-loop congestion control, and it is using to treat the congestion after it happens, then it has several techniques in different protocols like backpressure, choke packet techniques, implicit signaling, explicit signaling (forward signaling, backward signaling). then the algorithm are using in a congestion control like

- 1) Reliable data transmission algorithm
- 2) Congestion mitigation algorithm
- 3) Congestion detection algorithm



II. LITERATURE REVIEW

The author said that the problem occurs in many protocols that are used in a congestion control previously, then the transmission control protocol is a primarily used to works low-speed data in a high speed network and it will gives poor performance in the scheme. It is fails to satisfy essential design requirements of congestion control protocols, like small queue size and high utilization and packet drops [1]

In this paper, the packets are sends to the receiver from the base station in a low speed with high speed network and it will send the acknowledgement by three bit of fields and maintain the stability by the novel estimation algorithm for the congestion [9].

In this paper the Transmission control protocol requires the quality of service in the internet by using the friendly algorithm to achieve in the network for weight and biases in learning algorithm for optimum solution [10]

In this paper, the congestion reduces by the quality of time-sensing application in audio and video file, then the RED is used for control congestion by activequeuemangement and it is provides a new strategy to remove the packets, it will use the open loop congestion control method by the threshold value, lowering limit of constraint [2].

The author said that the ATM-based Networks are used to improve network utilization and robustness in Adaptive congestion control and it proves the evidence that reactive congestion control necessary here, it will consider bandwidth and delay to avoid the congestion. it is allows the parameter to predict the network in congestion of network. The proposed system is used the Connection Admission Control method to avoid the congestion like traffic, delay, fault tolerance by the type of controllable and uncontrollable method [10]

In multimedia application UDP or RCP to support the quality of service to control the renders audio and video streaming and it is supported by the TDP and RTP to maintain the quality of service control in an end to end of a network[3].

In this paper Linear adjustment algorithm is used for scalability issues into reconsideration and the new adaption scheme is based on the application to the network state and its congestion level [8].

In this paper, Wireless Sensor Network is uses the Mitigating Congestion algorithm to handle the hop by hop flow control via the back pressure method and reduces the packet loss control rate to avoid the waste of the transmission packets in the network, then it will uses the backlogged in MAC layer node to avoid buffer drops which is called as fusion method to improve network efficiency, fairness and channel lose rates [8].

In this paper analysis, the congestion algorithm is used for the queue length based control of a distribution globally convergent method and it is uses in a Bandwidth Delay Product paths, then the AIMD congestion control is uses in a windows sliding methods to avoid the congestion in a networks[4].

In this paper, TCP is uses for scalability of the high speed network to propose the Adaptive Layered TCP to modify the congestion window response for the RTT fairness in adaptive layer time transmission control protocol [5].

In this paper, we have to increase network speed by the high throughput and average queue sizes is low to achieve the congestion control or to avoid delay bandwidth, packet dropping in the internet when we are uses the TCP in the network gateway. To detect the congestion in a gateway to view the propagation delay and queuing delay in behavior over time, then the gateway is sharing by the many active links in wide range of roundtrip times[5].

In this method, congestion control protocol is use the out of the scheme congestion notification proposal for control theory frame work, round trip delay and the no of sources to achieve the bandwidth allocation, buffer over flow and time delay in highly varying traffic mode[6].

In this mechanism uses the one flow method is uses traffic to find streaming multimedia data and the transmission control protocol is reducing the data rate of the single packet by using equation algorithm [7].

III. METHODOLOGY

A.HEED (Hierarchical Energy-Efficient Distributed) Algorithm

A Wireless Sensor Network is consists of no of nodes like low cost of sensors in which is uses to collect and transmits the environmental data. It will collect the data are uses in regular intervals, converts the electronic signal as input data and it is transmits the data to a sink node through reliable wireless communications, then the node is rechargeable batteries by the limited energy and improve the life time of the node and reduces the energy consume in the network.

The HEED algorithm is uses like LEACH by using the primary parameter as residual energy and the secondary parameter as a network topology features like node degree and the distances of the neighbor node, then it will find the probability of the clustering node to execute the no of iteration to avoid the time delay to achieve the delay of the node [10].

IV. RESULT OF LITERATURE REVIEW

In this Section Process of Literature Review Pare shown in this Table

Author Name	Method
MariosLestas	Transmission control protocol
Sachin Kumar	Adaptive Congestion control protocol
Dorgam Sisalem	User Datagram protocol
Tran Xuan Truong	Heed Algorithm

V.CONCLUSION

Here we are studies the congestion control techniques in WSN by using the different protocols to develop the network life time in a neural network for optimum solution; in future we can develop the other artificial intelligent concept to control the congestion.



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