

Scholar's Name : Mumtaz Ahmed
Roll No : 13PHDCOM06
Guide Name : Prof. M.N Doja (Supervisor)
Prof. Mohd Amjad (Co-Supervisor)
Department : Computer Engineering
Nationality : Indian
Email-id : mahmed1@jmi.ac.in
ahmedmumtaz01@gmail.com

Title of the Abstract : Energy Efficient Spectrum Access Scheme in Wireless Sensor Networks

ABSTRACT

Wireless Sensor Networks are an active area of research with applications in areas like tracking and detecting zones, monitoring the environment, surveillance of industrial processing, medical systems and tactical systems. WSNs are an accumulation of sensor nodes that interact with one another to create a network. A major problem with WSNs is the limited power source that limits the lifetime of the sensor nodes. The solution calls for the design of an energy efficient medium access control protocol. In this research work, we will study the various properties of WSNs along with certain energy efficient MAC protocols that help in the design of wireless sensor networks that are energy efficient having an increased lifetime.

This work presented the in depth analysis on various (MAC) layer protocols and designed algorithm. All these methods have been implemented and modified for the wireless sensor networks. Some existing MAC algorithms are introduced with their problems and evaluation. Lastly, evaluation of various form of MAC protocols algorithms (such as S-MAC, IEEE802.11) have been done in our proposed work. A new MAC algorithm is proposed on the concept of S-MAC issues which have contention window (CW) according to carrier sense which is secure in

S-MAC & IS-MAC algorithm and capable to modify contention window based on the system traffic, energy spent reduced in IS-MAC (Improved Sensor MAC). Same MAC algorithm is modified with DCF-MAC method to improve successful data transmission and energy consumption in the network.

This work additionally exhibits a reenactment investigation of energy proficient WSNs under Dynamic Spectrum Access. In Wireless sensor networks a ton of data transfer capacity claimed by the essential clients goes unused. To recognize this issue, WSNs can be executed with dynamic spectrum access to utilize unutilized transfer speed appropriately. We have executed and recreated a Time Division Multiple Access based energy proficient subjective radio multichannel medium access control (MAC) protocol called S-MAC. A solitary channel Medium Access protocol does not perform well in view of the multichannel hidden terminal issue. The S-MAC convention handles this issue proficiently and enables optional clients to detect and use unused data transfer capacity. The proposed model is contrasted and IEEE 802.11 and SMAC with intermittent sleep. Broad reproduction results demonstrate that the model has a high system throughput and is energy productive. The whole model is created over Network Simulator 2.

The lifetime of Randomly Distributed wireless sensor networks gets effected do to the imbalanced energy consumption in sensor nodes. The energy consumption is balanced among sensor nodes by using the efficient clustering algorithm that is proposed in this research work. There are two cluster phases of EECS one is setup phase and another is steady state phase. The cluster election algorithm selects cluster head which uses sensor nodes local information. In the steady state phase, the time slots are allotted for member nodes as per the data which is available in sensor nodes. As compared to SA-EADC and EADC, the simulation results of EECS is better when viewed in consumption of energy and lifetime of a network.