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A GENERIC ALGORITHM TO IMPROVE THE PERFORMANCE OF WIRELESS SENSOR NETWORK PROTOCOL

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ABSTRACT:-A multi-hop wire-less network is composed of large number of nodes and consecutive links between them so that when a packet is transmitted from one node to another it goes through several path. Wireless sensor network normally consists of large number of distributed nodes that organizes them into a multi-hop wireless network. In wireless sensor network one of the main problems is related to energy issue because every node is operated by battery. To have large network life time all nodes need to minimize their energy consumption. Node is composed of small battery so that the energy associated with this node is very less. So replacing and refilling of battery is not possible which is very costly. Hence some techniques are applied through which the energy associated with each node can be conserved. Energy conservation can be done by controlling the transmission power of each node. In this thesis we have tried to implement a protocol in the literature and the performance of the protocol in sensor network.

Keywords:Multi-hop Wireless network; Adhoc Sensor network; Topology control

1.1 Introduction

The term "wireless" has become a generic and all-encompassing word used to describe communications in which electromagnetic waves to carry a signal over part or the entire communication path. Wireless technology can able to reach virtually every location on the surface of the earth. Due to tremendous success of wireless voice and messaging services, it is hardly surprising that wireless communication is beginning to be applied to the domain of personal and business computing. [1].Ad- hoc and Sensor Networks are one of the parts of the wireless communication.

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In ad-hoc network each and every nodes are allow to communicate with each other without any fixed infrastructure. This is actually one of the features that differentiate between ad-hoc and other wireless technology like cellular networks and wireless LAN which actually required infrastructure based communication like through some base station. [2].

Wireless sensor network are one of the category belongs to ad-hoc networks. Sensor network are also composed of nodes. Here actually the node has a specific name that is "Sensor" because these nodes are equipped with smart sensors [2]. A sensor node is a device that converts a sensed characteristic like temperature, vibrations, pressure into a form recognize by the users. Wireless sensor networks nodes are less mobile than ad- hoc networks. So mobility in case of ad-hoc is more. In wireless sensor network data are requested depending upon certain physical quantity. So wireless sensor network is data centric. A sensor consists of a transducer, an embedded processor, small memory unit and a wireless transceiver and all these devices run on the power supplied by an attached battery [1].

2.1 Topology controls for proposed Algorithm
Topology:
The topology of a multi-hop wireless network is a collection links by which various nodes in the network communicate with each other. It is just like a structure of a network. This topology is used by various mechanisms to select path in a network to send traffic so that the transmission of data from source to destination can be done efficiently. Topology affected by various factors like transmit power, antenna direction that can be controlled by proper implementation but there some factor like mobility, noise can't be controlled [4].

$$D\ (u,\ v) = ((x_1 - x_2)^2 + (y_1 - y_2)^2)^{1/2}$$

2.2 Topology Control:
Topology control is the mechanism by which nodes are arrange in such a way based upon their transmission range to increase network capacity and reduce node energy consumption [2].
So main goal of Topology control are
- Maximize network capacity
- Minimize Energy consumption

2.3 Classification:
Classification based on critical transmission range it broadly divided into two categories [2]:
- Homogeneous critical transmission range
- Heterogeneous critical transmission range

Homogeneous critical transmission range:
- Every node in the sensor network uses the same transmitting range.

Heterogeneous critical transmission range:
- Every node in the sensor network uses different transmitting range.

Topology control can be classified according to the critical transmitting range [2]:
- Homogeneous
- Non Homogeneous

Depending upon type of data available during computation of topology Non homogeneous topology control classified as:

         a. **Location based Topology control**
             i. **Range assignment and variant**
             ii. **Energy efficient communication**
         b. **Direction based Topology control**
         c. **Location free Topology control**

a. Location based topology control:
Location based approach can be applied when the node location are known to compute the corresponding topology. This topology control scheme can be applied to both centralized and distributed network. In case of centralize schemes the information about node location is used by centralized authority to calculate set of transmitting range. And in case of distributed network information is transformed between various nodes to find out the optimal transmission range. In sensor network the