© INTERNATIONAL JOURNAL FOR RESEARCH PUBLICATION & SEMINAR
ISSN: 2278-6848 | Volume: 08 Issue: 07 | July - September 2017
Paper is available at www.jrps.in | Email : info@jrps.in

`Enhancing the Wireless Sensor network life time using selection of nodes

Shakshi, Research Scholar, Department of ECE, IIET
Sharma.sakshi822@gmail.com

ISSN : 2278-6848 03
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Abstract **--- Clustering the Wireless Sensor Networks (WSNs) is the major issue which determines the lifetime of the network. The parameters chosen for clustering should be appropriate to form the clusters according to the need of applications. Some of well-known clustering techniques in WSN are designed only to reduce overall energy consumption in the network and increase the network lifetime. These algorithms achieve increased lifetime, but at the cost of overloading individual sensor nodes. Load balancing among the nodes in the network is also equally important in achieving increased lifetime. First Node Die (HND), and Last Node Die (LND) are the different metrics for analysing lifetime of network. In this paper, a new clustering algorithm, Genetic Algorithm based energy efficient Clustering Hierarchy (GAECH) algorithm is proposed to increase FND, HND, and LND with a novel fitness function. The fitness function in GAECH forms well-balanced clusters considering the core parameter of a cluster, which again increases both the stability period and lifetime of the network. The experimental results also clearly indicate better performance of GAECH over other algorithms in all the necessary aspects.**

Keywords--- **Clustering, LEACH, WSN, Genetic, Protocol, Energy conservation, CBCR**

1. Introduction

Wireless sensor networks have recently come into prominence because they hold the potential to revolutionize many segments of our economy and life, from environmental monitoring and conservation, to manufacturing and business asset management, to automation in the transportation and health care industries. The design, implementation, and operation of a sensor network requires the confluence of many disciplines, including signal processing, networking and protocols, embedded systems, information management and distributed algorithmsIn a typical sensor network, each sensor node operates untethered and has a microprocessor and a small amount of memory for signal processing and task scheduling. Each node is equipped with one or more sensing device such as acoustic microphone arrays, video or still cameras, infrared (IR), seismic, or magnetic sensors. Each sensor node communicates wirelessly with a few other local nodes within its radio communication range. Sensor networks extend the existing Internet deep into the physical environment. The resulting new network is orders of magnitude more expansive and dynamic than the current TCP/IP networks and is creating entirely new types of traffic that are quite different from what one finds on the Internet now. Information collected by and transmitted on a sensor network describes conditions of physical environments for example, temperature, humidity, or vibration and requires advanced query interfaces and search engines to effectively support user-level functions. Sensor networks may internetwork with an IP core network via a number of gateways. A gateway routes user queries or commands to the appropriate nodes in a sensor network. It also routes sensor data, at times aggregated and summarized, to users