

SPECIMEN FORMAT FOR THESES OF MONTH

Faculty : School of Engineering

Department : Electronics and Communication Engineering

Branch/ Area: : Wireless Sensor Networks

Sub Subject Heading: : Secured clustered based routing

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Title of the thesis : *Energy Efficient Clustering and Routing Techniques in Hierarchical Wireless Sensor Networks*

(i) In Roman Script -

(ii) In roman Script -

Nomenclature of Degree: : B.E,M.E, PhD

Month & Year of Enrolment: : July 2019

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Name of Supervisor : Dr.R.Sudarmani

Designation of Supervisor : Associate Professor & Head

Centre/department/school in : Electronics and Communication Engineering
which research was conducted

University's Name & Address : Avinashilingam Institute for Home science and Higher
Education for Women, Coimbatore

Abstract within 300 words:

Wireless Sensor Networks (WSN) is an important area of research and became very popular in Wireless Communication (WC). Nowadays, many real time applications are using sensors due to its characteristics such as scalability, small size, light in weight, easily portable, etc. Several sensor nodes associated with Wireless Sensor Networks are randomly dispersed in the surrounding environment with limited sensing, computing, and communication capabilities. All of the units in the sensor nodes are low powered battery operated device. The energy associated with the batteries are finite and also must be replaced when they run out, which raises the expense of maintenance. Self organization, concurrent processing are the important characteristics of WSN. Once the transmission takes place, the energy gets depleted and the node replacement is impossible even if the single node dies that result in network failure. Energy consumption, network life time and security are the major challenges faced by WSN. Maintaining a balance between energy consumption and network lifetime is always a challenging factor in WSN as both are inversely proportional to each other. Secured clustered routing techniques can be adopted to overcome this challenge.

The proposed work aims to provide a secured clustered routing protocol. The entire proposed work is divided into 3 stages namely clustering, routing and security.

First work is to form proper cluster and select proper cluster heads using Genetic Algorithm (GA) and Algorithm for Cluster Establishment (ACE). Data transmission in WSN consumes more energy compared to processing and the nodes that have long distance communication consume more energy than those with short distance communication; hence, the limited energy resources make it difficult to maintain energy throughout the network

Second phase of work is to perform routing based on the demand and node behaviour. Routing protocols improve the network lifetime and establish the perfect communication between the nodes. This work is mainly focused on maintaining connectivity between the nodes and increasing the network lifetime by incorporating two processes such as node behaviour analysis and on-demand secured data transmission, since node behaviour detection is very important.

Finally, a secured clustered based routing protocol establishes a fine path to transmit the data without any loss. An energy-efficient and secured routing protocol has been developed called Multi Criteria Based Secured Routing Protocol (MSRP). Every node has the ability to interact with the server and other nodes. Every time, the control layer is responsible for performing additional processing and stops all network processes if malicious node is suspected.

i) Major objectives :

- To reduce the energy consumption of the sensor networks by applying proper clustering and routing techniques in WSN.
- To develop secure clustered based routing protocol.
- To validate the proposed algorithms through simulation and compare it with the existing algorithms.

ii) Methodology :

Phase I

- Genetic Algorithm (GA) and Algorithm for Cluster Establishment (ACE) is performed to form cluster and select proper CH

Phase II

On-Demand Routing (ODR) Protocol is applied to find the node behavior and select the shortest path

Phase III

- Multi-criteria based Decision making transmits data in a secured manner using multiple criteria

Phase IV

- Results are evaluated and compared with the existing algorithms and the graph is plotted

iii) Findings:

The present work uses various optimization methods to identify a suitable method for locating the optimum routing path for secured algorithm in a clustered hierarchical WSN.

Examiners

Internal Examiner : Dr.V.Jeyalakshmi,
Professor, Anna University,
Guindy.