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Zone Adaptive Virtual Coordinate Selection Approach for WSN Optimization

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Abstract: Wireless networks provide the conception of distributed design in order that the sharing of knowledge yet as resources will be done effectively. There area unit completely different mediums of playing the communication over the network. This all results an efficient sharing of knowledge and resources. whereas playing the communication in such network there's the necessity of more practical info sharing techniques. The analysis paper is on the brink of perform the analysis of sensing element network underneath completely different real time situations in order that the work includes the discussion on sensing element network, its design and outline a virtual arranger primarily based routing for sensing element network in details. For this, we are going to use space localization approach to divide the network in smaller zones with specification of arranger node. Further, work is to keep up the zone nodes statistics on arranger node to spot the effective next hop. Final objective of the work is to attenuate the energy consumption and improve the network life. of these results area unit simulated with facilitate of Matlab 2013a tool in a very comparison with existing and purposed technique. Parameters taken in thought area unit alive & dead nodes analysis, spherical primarily based Communication Analysis.

Keywords: Image Processing, Thinning, Computer Vision.

I. INTRODUCTION

Wireless networks give the concept of distributed architecture so that the sharing of information as well as resources can be done effectively There are different kind of ad-hoc networks are available now these days With the advancement of internet and the growth of personal computers, the use of sensor networks are been increased very fast. There are different mediums of performing the communication over the network. This all results an effective sharing of information and resources. While performing the communication in such network there is the requirement of more effective information sharing techniques These kinds of network do not require any administrative intervention called ad-hoc network. A sensor network is defined as a wide public area network in which number of sensor node are connected. Mobility is the key property of such kind of network. A sensor node is made up of four basic components as shown in Figure 1.1: a sensing unit, a processing unit, a transceiver unit and a power unit. They may also have application dependent additional components such as a location finding system, a power generator and a mobilizer.

A sensor node is [19] made up of four basic components as shown in Figure 1.1: a sensing unit, a processing unit, a transceiver unit and a power unit. They may also have application dependent additional components such as a location finding system, a power generator and a mobilizer. Sensing units are usually composed of two subunits: sensors and analog to digital converters (ADCs). The analog signals produced by the sensors based on the observed phenomenon are converted to digital signals by the ADC, and then fed into the processing unit. The processing unit, which is generally associated with a small storage unit, manages the procedures that make the sensor node collaborate with the other nodes to carry out the assigned sensing tasks. A transceiver unit connects the node to the network. One of the most important components of a sensor node is the power unit. Power units may be supported by a power scavenging unit such as solar cells. There are also other subunits, which are application dependent. Most of the sensor network routing techniques and sensing tasks require the knowledge of location with high accuracy.

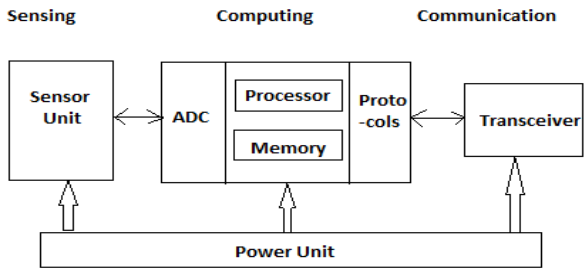

Figure 1: Components of Sensor Node

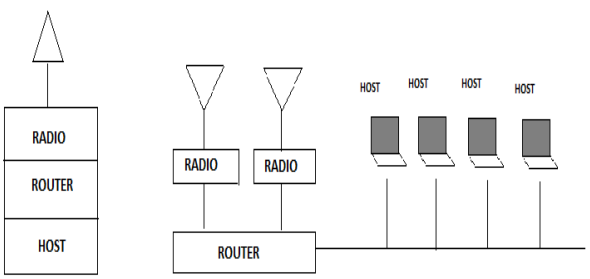

Figure 2: An Example of Sensor Network

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Thus, it is common that a sensor node has a location finding system. A mobilize may sometimes be needed to move sensor nodes when it is required to carry out the assigned tasks. All of these subunits may need to fit into a matchbox-sized module.

A sensor ad-hoc network is responsible to perform the communication between the sensor devices without setting up any dedicated or static infrastructure. The work includes the specification of dedicated routers and other communication devices without the inclusion of cables. It is actually described as the autonomous communication system in which wireless links are connected in the form of arbitrary graph. Such kind of networks can be established in the form stand alone acquired fashion and provide the effective communication over the network.

A sensor network performs the multi-hop cellular network model that requires the base stations as the main controller points. These kinds of networks can perform the reliable communication between two or more sensor nodes. In these networks, the base stations can be defined at fix locations. In this sensor network, an infrastructure less network topology is defined. This network architecture is defined in a P2P network. The decision of next node selection depends on different vectors such as number of packets transmitted in store and forward approach

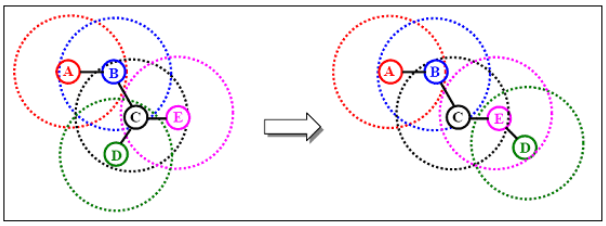

Figure 3: Multi-hop Communication in WSN

A sensor network performs the multi-hop cellular network model that requires the base stations as the main controller points.This network architecture is defined in a P2P network. The decision of next node selection depends on different vectors such as number of packets transmitted in store and forward approach.In such network, a source and destination nodes are specified and the intermediate communicating nodes are selected by the network itself dynamically according to the routing information over the network.

II. LITERATURE REVIEW

The presented work is about to generate an optimized route over the network so that all the network nodes will be covered. The work is about to present an effective aggregative path generation scheme under different parameters so that the energy and distance effective path will be generated. In this section, different routing approaches used by the earlier researchers are shown for any kind of sensor network.

Yean-Fu Wen has presented a work to optimize the aggregative routing approach in communication network. Author defined a scheduling mechanism to optimize the routing in clustered network. The analytical decision is here taken under multiple vectors such as capacity analysis, energy analysis and communication. Author has defined the network with some constraints specification. These constraints include the power range and the energy consumption. The effective communication is here been achieved by optimizing the clustered routing along with aggregative approach [1].

Yu GU has presented an improved scheduling approach to optimize the routing in communication network. Author has improved the coverage range and life time effective routing to optimize the network throughput and effectiveness. Author has considered the energy as the main constraint along with connectivity analysis. Author defined a static and dynamic clustering approach to define the network architecture. The communication is here based on the sample rate based specification so that the network optimization over the network will be improved. Author identified the aggregative routing with sensing range criteria and generates the optimized route under prioritized constraints [2].

Ahmad and Albhari [3] introduce a new approach for wireless sensor network power management which is based on neural networks. In this new approach an intelligent analysis is used to process the structure of a wireless sensor network (WSN) and produce some information which can be used to improve the performance of WSNs' management application. They applied their intelligent method to their previously proposed management approach which uses the concept of Multi-Agent systems for WSNs' management and observed the improvement of the performance. Wireless sensor networks need to be managed in different ways, e.g. power consumption of each sensor, efficient data routing without redundancy, sensing and data sending interval control etc. The random distribution of wireless sensors, numerous variables which affect WSN's operation and the uncertainty of different algorithms (such as sensors' self-localization) give a fuzzy nature to WSNs. Considering this fuzzy nature and numerous details, a neural network is an ideal tool to be used to cover these details which are so hard to be explicitly discovered and modeled. In this paper author introduce a neural network based approach which results in a more efficient routing path discovery and sensor power management.

Akyildiz[4] describes the concept of sensor networks which has been made viable by the convergence of micro electro mechanical systems technology, wireless communications and digital electronics. First, the sensing tasks and the potential sensor networks applications are explored, and a review of factors influencing the design of sensor networks is provided. Then, the communication architecture for sensor networks is outlined, and the algorithms and protocols developed for each layer in the literature are explored. Open research issues for the realization of sensor networks are also discussed.

Ajay Jangra[5] presented a work on infrastructure driven processing on sensor network optimization. Wireless sensor network (WSN) is an infrastructure less, low cost, dynamic topology, application oriented, multi-hoping

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network design with small, low power, sensing wireless distributed nods. WSN designing become more complex due to characteristics of deploying nodes, security, authentication and its operation scenario. This paper presents an analytical view on WSN architecture design issues, its objectives and implementation challenges.

Shio Kumar Singh[6] presented a work on different routing protocols present in sensor network. The sensor nodes have a limited transmission range, and their processing and storage capabilities as well as their energy resources are also limited. Routing protocols for wireless sensor networks are responsible for maintaining the routes in the network and have to ensure reliable multi-hop communication under these conditions. In this paper, Author gives a survey of routing protocols for Wireless Sensor Network and compares their strengths and limitations.

Kiran, Kamal and Nitin [7] discussed wireless sensor network is consist a large number of sensor node. And these nodes are resource constraint. That's why lifetime of the network is limited so the various approaches or protocol has been proposed for increasing the lifetime of the wireless sensor network. In this paper they discuss the data aggregation are one of the important techniques for enhancing the life time of the network.

III. PROBLEM DEFINITION

The main application area for sensor network is in the military field or the battle field to provide the survivability. T o survive in such critical conditions with war fighters, there is the requirement of some communication medium that is not fixed and does not required any extra infrastructure. This kind of conditions also needs to transmit different kind of data such as text, images, videos etc. A sensor network provides all these facilities and allows to perform the voice communication as well as to communicate effectively under such complicated situations. The sensor network is also defined under the physics of electromagnetic propagation [4]. It defines the frequency analysis so that the data can be transmitted at different frequencies. The frequency range of this network is from 100 MHz to LOS. The transmission in such network can be performed beyond the Terrain, foliage and manmade obstacles. The research paper is about to perform the analysis of sensor network under different real time scenarios. For this, we will use area localization approach to divide the network in smaller zones with specification of coordinator node. Further, work is to maintain the zone nodes statistics on coordinator node to identify the effective next hop. Final objective of the work is to minimize the energy consumption and improve the network life.

A sensor network is a real time critical network defined under limited resources and restricted constraints including the energy specification, sensing range, load and node criticality vector. The QoS Optimization under these vectors is a challenge for sensor network. In this present work, a virtual coordinate based activity analysis approach is defined to optimize the routing. The work includes the area localization based analysis in which complete network will be divided in smaller zones virtually. This zone level division will be based on the zone density, node connectivity and load vectors. Once the zones will be generated, each zone will be controlled by a virtual coordinator node. This virtual coordinator will store the information about the zone nodes. This information will be able to classify the effective and critical nodes over the zone. This virtual node identification and its updation will be done after a fix time interval. After specification of these zones, when the routing will be performed, the identification of virtual coordinators over the path will be done. These virtual coordinator will suggest the most effective nodes that can be used as the intermediate node over the route. By using these effective nodes, the communication route will be generated over the network. The presented work will be performed in matlab environment. The work will analyze the network under energy and network life parameters.

IV. OBJECTIVE

The proposed research work is about to achieve the following research objectives

- The main objective of the work is to define a virtual coordinator based routing for sensor network.
- The objective of the work is to use area localization approach to divide the network in smaller zones with specification of coordinator node.
- The objective of the work is to maintain the zone nodes statistics on coordinator node to identify the effective next hop.
- The objective of the work is to minimize the energy consumption and improve the network life.
- The objective of the work is to implement the work in matlab environment.

V. RESULTS & DISCUSSIONS

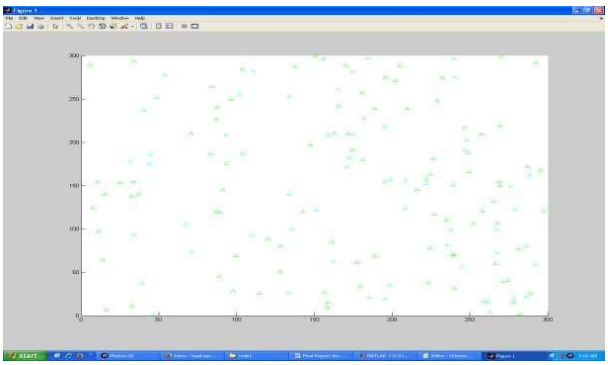

Figure 4: Network Architecture

Here figure 4 is showing the network structure defined in this work. The network is here defined in restricted area of 300x300. The network is having 150 nodes with random energy specification. The green nodes here presents the normal nodes and the cyan color nodes are the critical nodes of network. The work has defined a zone adaptive model to provide the communication in effective way.

VI. CONCLUSION AND FUTURE WORK

In this paper, a virtual coordinator based model is defined to provide the optimize network communication in integrated communication. The virtual coordinator has been selected here based on the node level analysis. This coordinator selection will be done under density and the parameter selection. Once the coordinator node will be identified, the zones are generated under the load and criticality of nodes. The communication is here performed by the virtual coordinator when the nodes are critical. The normal network nodes are able to perform the communication without the specification of coordinator node. The work can be improved in future under following aspects: a virtual coordinator based zone adaptive model is defined for improving the communication in sensor network. The node criticality and load parameters are here considered as criticality vector. In future some other parameters can be considered. In this present work, no optimization algorithm is applied to improve the communication but in future some such optimization algorithm can be applied to improve the communication.

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