# An Efficient Data Gathering Technique Using Ant colony optimization technique in WSN

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*Abstract - For fastest way of communication we need very smart way of processing the information we handled in day to day life such as in industries, medical, armed fields and other such various fields in world. Thus the wireless sensor network done a very great jobs in handling data and along with many factors that slow down the processing such as smart way of using energy, time delays etc . To make get rid all such main factors such as energy utilization (1) and to give a very quick path to communicate with other mobile node we made utilize the ant colony optimization algorithm. In ant colony based algorithm we can able to track or communicate the other node by using the selective group node approach which are able to communicate faster (13). They will increase the energy utilization by decrease the node weight. Since the weight on the residual node is getting lower the energy utilize by each node is decreased thus they provide the better working duration (2) of the wireless sensor. The result simulated will give the better comparison on existing algorithm.*

## INTRODUCTION

Over a decenary the wireless sensor network usage have been increased throughout the world. They perform task in various field for development and enrich those fields. The fields were the wireless sensor network used mostly is Agriculture, Defense area and Industry. They are preferred mainly due to their huge functional value. For example in Defense fields their functional value is to monitoring the battle fields and Industries they are used to control and monitor the temperature, pressure, moisture detection etc. However wireless sensor network having some limitation. Since they are wireless so they are battery power supplied sensor node. They would be replaced periodically and another important issue is energy saving. By considering the case of static base station node, data are transferred in multi-hop manner (3) (11) which leads to traffic and sensor are located near the base station will consume more energy.

To manage the hotspot problem, using the mobile station to collect the data in wireless sensor network become hike in recent years.The mobile base stations are made to travel in defined path. So it is used to reduce the energy utilization which is more equal in the entire network. For large scale implementation they are poor in collection of data. A possible way is to withstand a particular putting off to satisfy for the energy utilization and putting off which is arise due to the data gathering.

The entire network will split (5) into many path trees and few sensor nodes becomes a collective node point (3). The remaining nodes leading the data to neighbouring collective node points which are been pass over through the base station. The overall work done by the network and data collection ability is affected directly by the path selection therefore the important critical factor of the system is to advance the energy usage and to collect as many data as possible along the convinced time delay. In this paper, we concentrated on network

lifetime problem based on the gatheringof data and time sensitivity involved in it to transmit the data to mobile base station.

## METHODS

The overall performance of the system is reduced directly and affects the ability to collect the data due to the mobile base station and path selection. We made this research to innovate the smart way of using energy and to collect plenty of information possible within the short span of time(6). To cut down the large number of nodes precisely accessed by base station and to reduce the pass through path, the choice of choosing the collective nodes by using node weight methodology is introduced confer to nodes density the degree of similarity distribution and similar residual energy. To achieve this ant colony optimization is used to obtain the path which is accessed through optimal for the base station so as to improve the energy utilization of the network and delay due to transmission.

## SIMILAR WORK

To get the effective data delivery we need two basic operation's one is the effective way to collect the data. For example let us look on the wireless sensor network in industry. The collection of data is a significant one. The nodes in the industry detect fascinating events and data's are collected, which is sends to the base station via single (or) multi-hops. Another one is important to boost lifetime of network is mainly because of the energy restriction (14) of the sensor node. The schemes for data collection based on mobile base station in data delivery tasks are having an explicit impact due to the orbits of the mobile base station.

The patterns for mobility of base station in industrial wireless sensor network are categorize as

1. Variable mobility pattern.

2. Standard path mobility pattern.

3. Controlled mobility pattern.

Currently they are many number of data sample schemes were suggested for mobile base station based wireless sensor network's.

In military the wireless sensor network had done a great job in the diplomatic environment. The data's are transmitted from the nodes by self management (12). The network becomes disabled while the data transmission by energy may run out in nodes of some network (or) disturbance arises in the link (or) even by the critically bad environment. In military the usage of UAV (Unmanned Aerial Vehicles) for data collection in the diplomatic edge sensor network clear up these problems and lead the life of overall network(7). A present year there is a lot of analyzes used UAV's like mobile nodes to seek the data's recovery. If low inactivity and long operation time is mandatory, spreading out a satisfactory number of UAV's to accomplish coverage for entire available sensor nodes. This is known as static data collection.

Until the operation is getting finished the entire Unmanned Aerial Vehicles will not moving from the position. Commonly there are not able to cover all spread out UAV's to collect all data from the targets during same time. So the UAV's need the predefined flight path. Currently they analyze that UAV's predefined flight path

can be divided as region coverage path planning and area path planning (10) (14). The entire coverage of the allocated area can be achieved by using area coverage path planning.

## SUGGESED METHODOLOGY

WORKING MODEL

In case the wireless sensor are irregularly spread nodes over in the controlled area which is in rectangular shape. This leads to the formation of multi-hop self management network. After the spread over of the sensor node in the network is entirely connected together and each as distinct identities and they will be no movement of nodes. They are powered by finite energy and they cannot be strengthened. Individual nodes will be constructed with the equal communication radius and as an equal basic energy (17). Base station node is efficient of power supply which is provided externally.

To decrease the larger transmission over head due o the long distance transmission. The multi-hope mode is used by network is sensor node is sending forward a data packets to destination. They are two types of sensor nodes they are

1. Collective node.
2. Ordinary node.

The data collection is started by ordinary nodes in the network by multi-hopes method. The collected data is transmitted to the nearby collective node. The rendezvous node is connected directly to the mobile base station when the mobile base station is entered into its orbit. By decreasing the addition of node from the normal nodes to collective nodes will be equal to boosting of entire energy utilization (16) in the network.In case of mobile base station's data gathered in number of nodes gamble on the choosing of collective nodes of mobile base station. The energy utilization is affected directly by the choice of mobile base station orbits.

STATERGY FOR COLLECTION OF DATA ALONG WITH RESTRICTION OF DELAY

It is essential to boost up the base station point orbit in wireless sensor network in order to achieve the delay obligations and reducing the entire utilization of energy in the networks. The overall utilization of energy is reduced by the optimal mobile base station path formation which is helps to overcome the restriction of delays in network. This strategy is essential to solve the two problem involved one is to boosting of travel path by choice to select the mobile base station nodes of the entire requirements for time delay and another one is to set the low utilization of energy (20) by satisfying the optimal set of rendezvous node in the entire network.
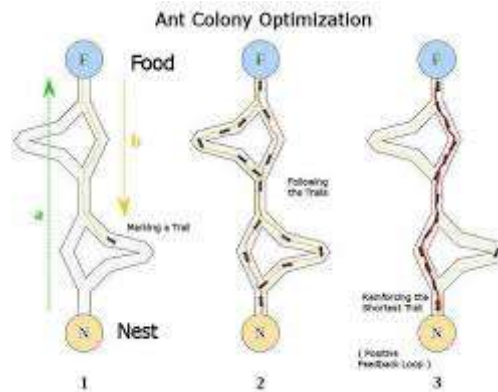
Fig1.Ant colony optimization

FORMATION OF RENDEZVOUS NODE

Choosing of resident points leads to take an account widely based on the factors like thickness of nodes, similar residual energy and uniformity of dissemination. As the collective node directly sends data to the mobile base station. The rendezvous node is responsible for the fusion inside a particular range and as to undertake larger energy utilization.

The relative energy is defined as the ratio of residual energy to initial energy of the node. The total node in the spectrum of communication is known as node density.

PATH SELECTION

Bionic technique is a method of Ant colony optimization that is detected from demeanor of original ant. To identify a optimal route by graph, it's used to give solution for optimization issue and shortest path to the traveling salesman problem .Ant colony optimization has the courtesy of randomized ,adjustability and it give a perfect solution. Ant colony optimization there is demerits, there is some deviation and it does not reach the optimal solution.

The scheming of the trajectory can nearly proximate to traveling salesman problem that can determine proximately by accepting ant colony optimization. From the present node ant can select the next-hop node from the adjoining node, the chance of selecting the path is important.

For distance control, set the point of access with minimum energy consuming, that it is sensible to select the entrance node depend on the gain of energy and distant through mobile sink .By finding the impact of collective selection on worldwide power usage preference route, through that we establish the approach of path superiority ,small superiority give better path quality.

Pursuant to the relation among distant amount and power increases the path superiority give the world wide shortest path (13) for user node to be chosen as next hop.

The ant move to the starting point in the same direction and finish the worldwide pheromone renovated. To improve the gaining of network the renovated pheromone energy (19) is needed to obtain path through path superiority and equalizing the energy.

Experiment:

From the above mentioned process to correct the performing activity more temptation is evaluated .It presented in rectangular shape. The emphasized manner is related equate to similar work data guided path planning protocol [DGPPP] for data collection within a mobile sink. In the upcoming resource the interference and have a rules for communicating data collection. Here shows the difference of the mean transmission delay of data gathered in mobile access sink node. To react in worldwide preference and to omit the effect of energy concluded before the dead node is chosen. In this experiment result, to finish the entire cycle of data the data –driven routing protocol need much time compared to the proposed method. The (17) DGPPP require several node and relay nodes are distributed that carry the data from far distance. In the proposed method, the preferences given to collective node to select the suitable way of navigation path of mobile sink. The gathering of data efficiency increased and latency is reduced compare to another algorithms, when node are splitted densely it show the delay time.

Equating the consumption of energy using three algorithm with different hop, when it set to 3 or 4, the DDRP and proposed method bring the optimal energy consumption to reach optimization single hope and more hop are required this is due to improper gallery by setting hop without any knowledge it lead to produce more no of energy consumption .the result of this experiment shows energy consumption of DDRP is larger than other algorithms.
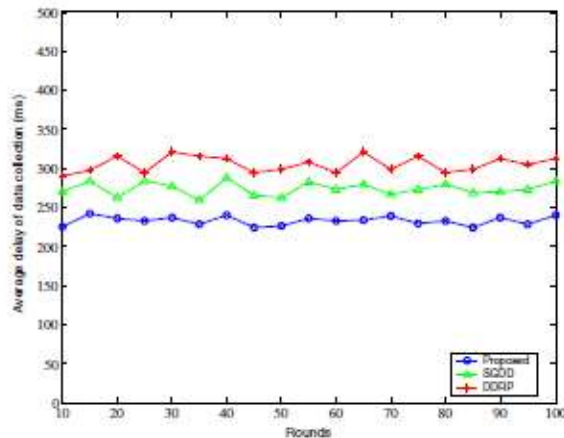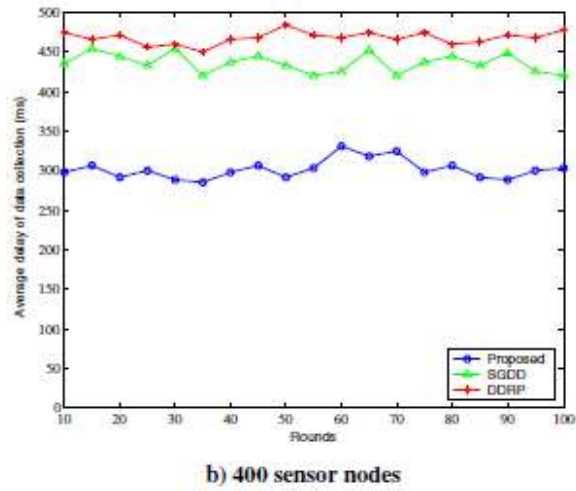


a) 200 sensor nodes

b) 400 sensor nodes

Fig. 2 The average delay of data collection



a) 200 sensor nodes
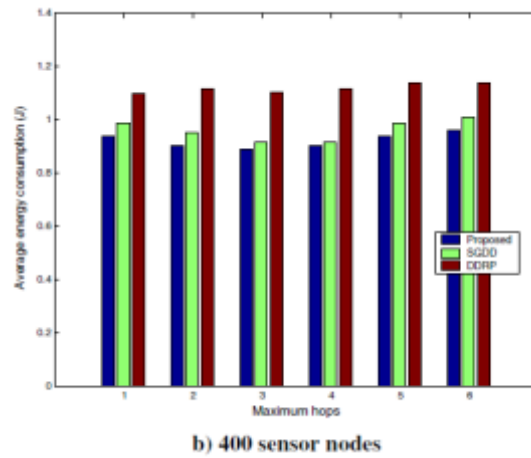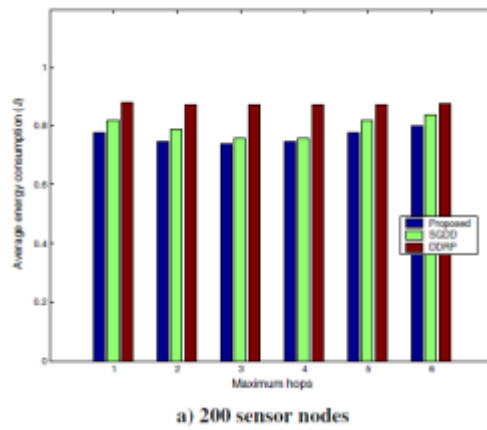


b) 400 sensor nodes

Fig. 3 The average energy consumption under different hop limits

To clarify the impact of proposed algorithm, it is related with DDRP (14) of average hop,the no of nodes are having long lift time .this method is used to achieve more than the present method it balance the working time.it increase the lifetime and data collected  from multiple node to the mobile sink

Conclusion

The need of wireless sensor network in the various fields is increased and the network occupy from the top to bottom of the region.  here we use an ant colony optimization algorithm and spiral UAV algorithm on mobile sink to reduce several number of nodes used to transfer the data without any congestion and traffic less network ,shorten the quiet path. RN method is selected based on entropy weight to distribute equal amount of energy. The ant colony optimization is used to bring optimal path from the mobile node that consume more energy and delay during transmission.

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