International Journal of Engineering Research-Online
A Peer Reviewed International Journal
Email:editorijoer@gmail.com http://www.ijoer.in

Vol.4., Issue.2., 2016
(Mar-Apr)

RESEARCH ARTICLE

ISSN: 2321-7758

UPDATED PSO BASED LOCALIZATION PROBLEM RESOLVING IN WIRELESS NETWORK

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ABSTRACT

In wireless sensor networks the sensors are used for the communication between the various nodes. Deployment of the node is important part of setting the network .The system will efficiently work if the sensors are deployed properly. The main aim of this paper is to propose a technique that is better than traditional technique of the localization. Traditionally various swarm intelligence techniques like ACO, BFO, PSO etc were used for the localization process. In this the modified Particle swarm optimization technique is proposed which works on the position parameter. A comparison between the proposed and the traditional method is the made in order to obtain the efficient method of the localization.

Keywords—Wireless sensor network, PSO, MPSO,BFO, ACO

INTRODUCTION

Wireless communication is the medium of the transferring the data without any physical link. These systems consist of large number of sensors node among which the communication take place, Sensor node is the small device that is used for the monitoring and for doing surveillance, every sensor node is appareled with transducer, transceiver and the power source.

While setting up the network the position of the node is defined once during the initialization, but if the nodes are mobile they can continuously move and can obtain their position. The deployment of the senor is the network is the crucial and the important task for setting a wireless sensor network. The main work of the sensor network is to monitor and gather the information. The nodes should be properly deployed in order to achieve better coverage, connectivity etc. This can also results in the increase in the life time of the network.. Localization of nodes is very crucial to find and determine location of sensor node with the help of specialized algorithm.

Related work

Localization means of the deployment of the sensor nodes in the network. Various techniques have been used earlier to solve the problem of the localization in the wireless sensor network some of which have been discussed below: -

Gurjot Singh GABA et al. [1] proposed the bacterial Foraging optimization is used for resolving the problem of the sensor deployment. The proper positioning of the sensors in the network can leads to better coverage, connectivity and may also lead in the increase in the life time of the network.

For the sensor deployment, Bhondekar et al.[2] in proposed Genetic Algorithm (GA) as an optimization technique. A multi-objective

methodology was implemented for a self organizing Wireless Sensor Network. The problem has been modeled in MATLAB by taking network density, coverage and energy consumption as parameters.

Er. Nisha Devi et al [3] present an approach of the resolving the localization problem, in this the optimum location of the sensors node is found and the distance between the sensor and the nodes is calculated. The fitness value that is calculated should be maximum for nodes and the sensors. The fitness value depends on the attenuation, power received etc .

Kukunuru et al. in [4] describes the problem of deployment. They solved the problem using Particle Swarm Optimization (PSO). The PSO approach has provided the maximum coverage with the minimum number of sensor nodes. The particles reached at the result after 200 interactions.

Aruna et al [5] presents an approach in which soft computing technique has been implemented. The Bacteria Foraging Optimization is in this paper for resolving the problem of the localization.

Swarm intelligence

Swarm intelligence is the method that composed of eth natural and artificial systems that consists of the many individuals that are relatively homogenous. The overall behavior of the system results from the interactions of individuals with each other and with their environment .Swarm intelligence techniques can be used for various applications some of the swarm intelligence techniques have been discussed as following:-

1 **Genetic algorithm**: **:** A genetic algorithm (GA) is a hunt procedure utilized as a part of figuring to discover correct or estimated answers for improvement and pursuit issues..It is considered to be a useful algorithm for obtaining the optimized result

2 **Ant colony optimization** -: ACO is an optimization algorithm that uses a graph for solving computational problems and finding good paths. ACO stands for Ant Colony Optimization, an algorithm that is based on the behavior of ants that finds path between their colony and the food source.

3. **Particle swarm optimization**:- This is an efficient algorithm that deals with the problem in which the solution is given by the objective value . It deals with the velocity function of the system. While moving in the search space, particles memorize the position of the best solution they found

4. **Bacteria Foraging Optimization**; - This is simple and easy implemented algorithm .it is nature inspired optimization algorithm which is based on the foraging behavior of E.coli bacteria. The classical bacterial foraging optimization systems consists of thee principle mechanisms namely chemo taxis, reproduction and elimination and dispersal.

IV PROBLEM FORMULATION

The deployment of the sensor in the network is an important and crucial task .If the sensors are not properly deployed it can leads to various problems in the network. This is the foremost step while setting the network. If the sensors nodes are properly deployed they can give better coverage and connectivity. Many work have done earlier for resolving the problem of the deployment of the nodes various swarm intelligence techniques have been used like ACO, BFO, PSO etc, but all these techniques were not efficient so there is need to propose an new technique in which the following points are kept in mind while setting the network :

1. Selection of the best route on the basis of the distance between the sensors and the nodes.
2. To increase the coverage of the sensor so that every node is able to communicate with the sensor.
3. To optimize the mean location points of the wireless sensor network

Proposed Methodology

In this work, a new approach for the deployment of the sensor in the network is proposed. In above section the problem of the localization is discussed, previously the ACO, BFO, PSO etc were used for sensor deployment. So to overcome the problem of the traditional techniques Modified particle swarm optimization (MPSO) is used that is considered as better approach than the traditional PSO. The PSO finds the solution on the

basis of the velocity parameters. In the proposed MPSO technique the solution is fins on the basis of the position parameter .As while the localization is done the position of the sensor node is changed so by applying such algorithm that works on the position parameters more beneficial. So this approach is considered to be better than the traditional methods of the localization.

METHODOLOGY OF THE PROPOSED WORK

With the help of the modified particle Swarm intelligence (MPSO) the new approach is proposed. The methodology of the proposed work is given as under.

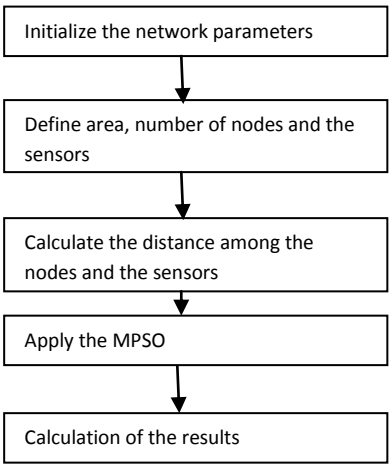

Fig 1 Block diagram of the proposed methodology

Step I initially the network parameters are defined .

Step II Now defines the area, number of sensor nodes and the node of the network.

Step III After this the calculation of the distance is done among the nodes and the sensors so that the clusters are formed.

Step IV Apply MPSO algorithm and calculate the results

RESULTS AND DISSCUSIONS

In this section there is discussion about the results of proposed method of localization. The MPSO algorithm is used for the localization process. The following graphs represents the before and after position of the sensor by applying the proposed method.

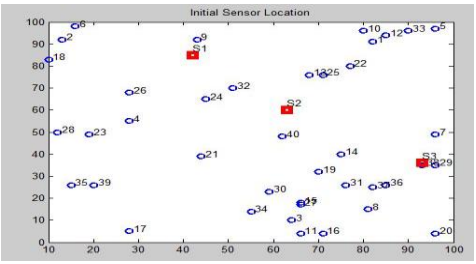

Fig 2 . The initial position of the sensor node.

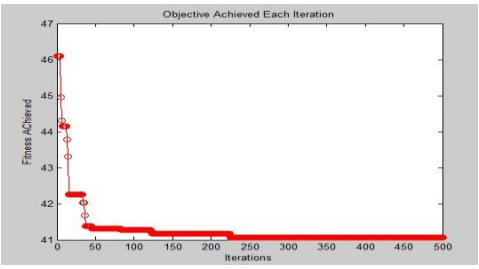

Fig 3 Calculation of the fitness value

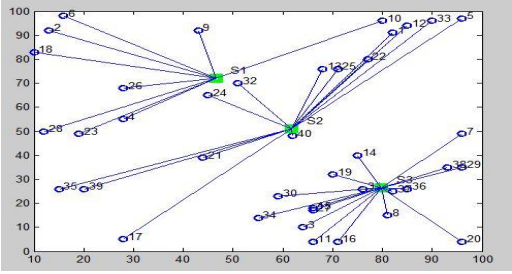

Fig 4 Applying MPSO method .

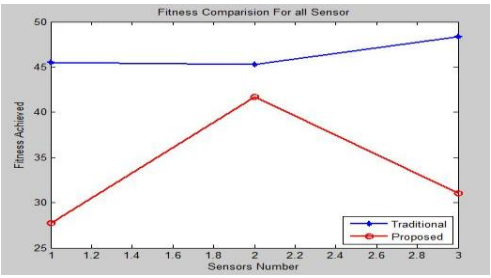

Fig 5 Comparison between the traditional and the proposed method

VII. CONCULSION AND FUTUR SCOPE

It is observed after implementing the traditional methods of localization they are not that much efficient, so in proposed work MPSO algorithm is used from the results contained it is concluded that the proposed method is better than the traditional method of localization.

In future the enhancements can be done by enhancing the localization dependency or by using the soft computing techniques to achieve a particular objective up to an extent so that if there is

any variation in results that can be modified by these soft computing techniques.

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