

Directional Antenna with reproduction optimization (BFOA) used in Mobile ad hoc network

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Abstract- WSNs are used in considering applications normally follow a ring and star topology where all SNs passes information to Centre controllerto Information Collision). Re-configurable antenna with optimization brings a capable solution to decrease the accidents due to data transmit and obtain authority in a valuable way, conflicting to classical approach of omnidirectional antenna. Enhancement is two different scenarios: an increase digital antenna acquires which related to some situations expand data transmission value, thus enhancing the amount of mobile nodes essential for extending the system network space and reduction in mandatory data transmission power. The main profits, regarded of this research applying RDA with BFOA optimizing algorithm for MANET or WSNs are regarded sparse. In existing work, re-change directional antennas bring new chances to recover and optimize the data collision in WSNs. Various methods are

I. INTRODUCTION

The ad-hoc Network is a structure-less system and consequently reorganized kind of wireless system. Every node takes part in writing by the forward information to all knobs in the network in ad-hoc system and coarseness of which handles forward information is made with eagerness on the base of the network. Hubs with each other's radio range interconnect coordinated by remote connections despite the fact that those which far independently depend on supplementary hubs to send information. MANET remains for versatile, particularly appointed network system. It is a self-arrangement plan which is a systems lighter by conduct. In Mobile ad hoc networks, a wider range of versatile hubs is associated by remote connections. Every last hub allows for transmission, i.e. no focal controller accessible [1, 2].

In Mobile ad hoc networks, a given sensor devices are linked through wireless acquaintances. Each sensor device in a mobile ad hoc network is allowed to transfer autonomously throughout the network. It may transform its relations to any other sensor devices commonly. The key challenge of establishing a MANET is preparing very single device to incessantly maintain data which are very essential to accurately route traffic.[3]

The mobile ad hoc network characteristics are:-

1. A transitory network is conventional which an assortment of mobile nodes(MN).
2. Data Network topology variations frequently.

surveying the recharge directional antenna reliant on received cycle (RDA-RICHER) medium access control rules has implemented for WSN sensor nodes devices with switched antennas. The wide research has been done on wireless network through RDA method that essentially reduces the rate of the energy consumption. The model of the energy consumption is for desired number of nodes. The main issue of the unique node and energy efficiency are undertaken in proposed research using bacteria foraging optimization and also evaluate the optimize energy consumption, optimize latency, received signal strength and collision rates in percentage.

Keywords:- Directed Antenna, RDA-RICHER, MANET and OPTIMIZATION process.

The MANET is categorized into three type's .These are described below:[4]

A. Vehicular Ad Hoc Networks

VANET is the method of communication among moving nodes. Hence, data communication can be acquired through the movement of the variant directions in a specified area.

B. Intelligent Vehicular ad hoc networks

Intelligent VANET is used for extraction of the movement issues in the network topology[6]. There are many applications related to Mobile ad hoc network. The main uses of MANET are described below:

A. Emergency Facilities:

This approach can be used during the emergency condition when there is an occurrence of the accidents. The data required for the affected location and area in order to acquire the relief from accidents. The controlling scheme has to deal with the difficult situations [7].

B. Military Service: Computer vision services helps to determine the data through some kind of the shared service. Armies get the use of the identification of various through simpler methods. Digital antenna used for sending and receiving the data signal such as microwave, satellite data. Digital antenna alters the data signal through electrical data. Digital antenna may emit the data energy to various locations. Wireless sensor device consists of digital antenna through outer network [8].

Antenna system is a infrastructures network finished up of radio signals prepared in a sensor topology. WSN mainly entail of sensor customers, sensor paths and data gateways. The sensor users are typically digital laptops, mobile phones or some other kind of wireless sensor tools, though sensor routers advancing traffic loadlink to the digital technology. The reporting part of the dispersal, hops operates as a particular system known as sensor cloud. Admission to this sensor cloud is reliant on the radio hop occupied in accord with another to build radio system. A sensor topology is dependable and deal termination stuff. The miniature one hop could possibly be able to still attach with each other, over one or more provisional node. Wireless sensor networks can be applied with different wireless expertise containing 802.11 [9], cellular technologies, 802.15, 802.16, or mixtures of more than one type. Sensor networking is a type of networking where every node may not distribute its own data, then again also backing as a convey future for several other nodes, to be exact; it is important to collect program the records in the network. Digital antenna may determine through uncommon wireless network. . Digital Antenna network frequently has maximum deliberate conformation, accessible active in addition to cost actual connectivity over a convinced geographical location [10].

Mainly two kinds of antenna. One is Omni directional and the second is directional Antenna: [11,12]

i) Omni-direction antenna: The method of passing the information in every path or position.

ii) Indicator: The direction digital antenna release and passes a digital signal in specific way.

In research work implemented a Bacteria Foraging is an evolutionary algorithm (EA) estimates the cost function for each selected phase of the execution of the program and leads to the least cost functions. The location of the bacterium is through determined group of the parametric metrics. recognized the separate values at space coordinates. The bacteria transfer to new positions and each position is computed and then calculates the cost function. The reducing cost function decided by the movement of the bacteria. At last the capability of the highest set of optimization parameters leads to positions of the bacteria.

II. RELATED WORK

Sasmita Mohapatra et al., 2016 [13] proposed a research that more vitality proficient through insight was utilized as a base for making Adaptable specially appointed system (MANET) and for Honey bee Impromptu C, the clustered based approach utilized. It was the best method in past work beside Stable Group Support Plan. A parallel steering had been considered in the arranged plan to enhance the adaptability of the structure, spared the directing time and diminished the deception alongside enhanced throughput. With the utilization of Fringe Group Hubs (BCN) between bunches, extra care had

been taken here for entomb group correspondence. The outcomes were discovered utilizing the NS2 (System Test system 2). The MANET directing could be legitimately adjusted as far as vitality proficiency, vitality exhaustion for steering, Steering finds, End-to-End delay, bundle estimate Versus Conveyance - Proportion, bundle measure. **Intae Kang et al., 2003 [14]** researched on power-effective communicate steering issue utilizing directional radio wires. The principle of the creator all things considered, when receiving wire pillar width turned out to be little. The creator made a correlation between the asymptotic union properties of already communicate directs calculations and asymptotically ideal structures. Calculations diminished aggregate transmit control utilizing directional receiving wires new and old were presented and outlined. Creator additionally characterized a dynamic programming answer for an ideal pillar task issue in multi-shaft versatile receiving wires. Additionally gave the broad execution of correlation comes about. **Emad Felemban et al., 2010 [15]** proposed a research on gathered information in numerous various application settings; the remote sensor systems had been utilized. The limit of systems remains a principal snag is towards the adjustment of sensor organize frameworks for cutting edge applications, required higher information rates and amount. The possible method of coordinated directional radio data wires for the removal of the sensor scheme searched by inventor. The specified scheme appoints the utilisation of the directional equipment that may anticipated before head, the utilisation of the sensor devices take two facts and added issues.

Creator characterized that the sectored Receiving wire Medium Get to Control was presented. Fundamentally it was a crossed layer convention that gave the correspondence systems to device system to completely use sectored radio wires. S-AMAC conveyed high vitality productivity and unsurprising postpone execution with smooth corruption in execution with expanded load. it was demonstrated by re-enactment examine. **P.- J. WAN et al., 2002 [16]** defined that , the hubs were controlled with batteries just ,the vitality preservation was main problem in essentially allocated remote scheme for central hub and scheme. For vitality protection, main road a correspondence session along the course which requires the most reduced aggregate energy consumption. it was one of the real procedures of vitality transformation This enhancement issue was alluded to as Least Vitality Directing. Briefest way calculations were utilized for this reason. It stays open whether the base energy connect guiding issue could be settled in polynomial time, instead of the NP-hardness of its regular chart form. As of late three getting a handle on heuristics were proposed named MST (least crossing tree), SPT (most limited way tree), and BIP (broadcasting incremental authority). They had been assessed through reproductions, however little was thought about their explanatory exhibitions. A quantitative portrayal of their exhibitions regarding guess proportions was the primary commitment of the creator. By investigating geometric setups of Euclidean MSTs, we had possessed the capacity to demonstrate that the estimate proportion of MST was more,

and the guess proportion of BIP was more than MST then again, the creator demonstrated that the estimation proportion of SPT was in any event $n/2$, where n is the quantity of accepting hubs.

III. PROPOSED METHODOLOGY

The main research work aims are: (i). To study the mobile ad-hoc networks and the designed scenarios using antenna theory in terms of energy consumption and get the data signal intensity (ii) To establish the data radiated and to design radiation pattern using Das to calculate the energy consumption in rendezvous step and full-scanning step (iii) Implementation BFOA algorithm for calculating the optimize energy consumption in all directions base on PLs and RSS and (iv) Compared the Performance in terms of EC and the CR (Collision Rate) with the based techniques (RDA model).

In a simulation environment firstly deploy nodes randomly. Following steps, explore the working of Proposed Methodology:

1. First, Enter the network area in terms of network length and width.
2. It will start the specifications such as bits to be sent initial transmission powers and number of nodes to deployed.
3. It figure out the connection of each node with the nearest nodes depend on calculation of Coverage Area which defines the nearest node connections.
4. Find intersections of individual link nodes with the other connection link node to search the directories.
5. Calculate the vector to search the direction for each link nodes and their corresponding angles in degrees when the network signal modified.
6. Then we will evaluate the route failure and depends on the path losses we will evaluate the nodes directivity having high signal strength.
7. Then it has evaluated the energy consumption and collision rates.
8. The we call bacteria foraging optimization and also evaluate the optimize energy consumption, optimize latency, received signal strength and collision rates in percentage.

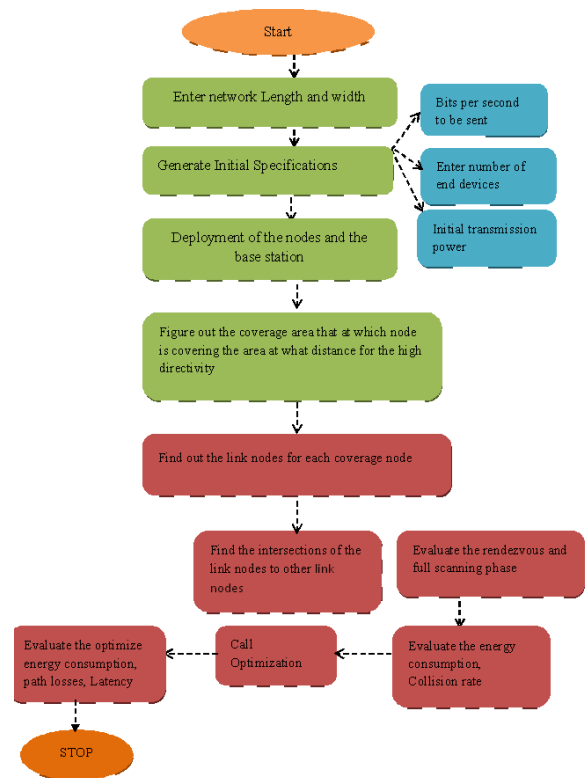


Fig.1: Proposed Flow Chart

IV. RESULT DISCUSSIONS

The proposed methodology is implemented in MATLAB. This technique Optimized Bacteria Foraging Optimization Algorithm with RDA model for simulation in MATLAB. The system network pattern is 10000×10000 where hops are deployed. In this research deployed eight nodes in the network.

At initial, deploy the random nodes with id i.e. EN1, EN2,.....EN8. The deployed nodes further find connections based on their angles of directivities. From this directivities radiation patterns has been induced. In addition other stages are established in form of graph i.e. rendezvous phase, full scanning phase with respect to their energy consumption, collision rate.

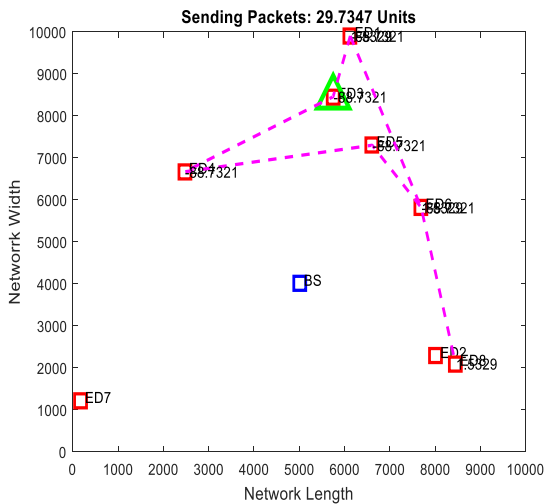


Fig.2: ED joining based on their direction of angles

The above figure shows the End plans joining based on their angles of directivities and is sending packets among the neighbouring nodes. As these nodes are coming in the coverage of each node with their distances as the coverage area defines that the nodes coming in the coverage of which node and they are having how much distance at that coverage.

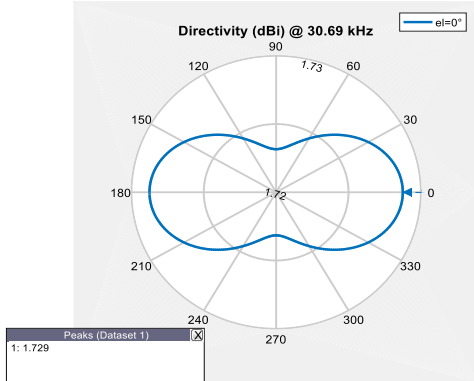


Fig.3: Radiation pattern using the omnidirectional antenna

The above figure 3 shows the radiation pattern using the omnidirectional antenna. Radiation design is also called as branch design related to direction use of the digital radio wave intensity through sender to receiver initially. The given diagram described radiation design in polarised coordinate in four co-ordinated in omni-direction. This determine about variation of the energy communicated sender as method of position. The energy variation used as need of the receiving method acquired in system network.

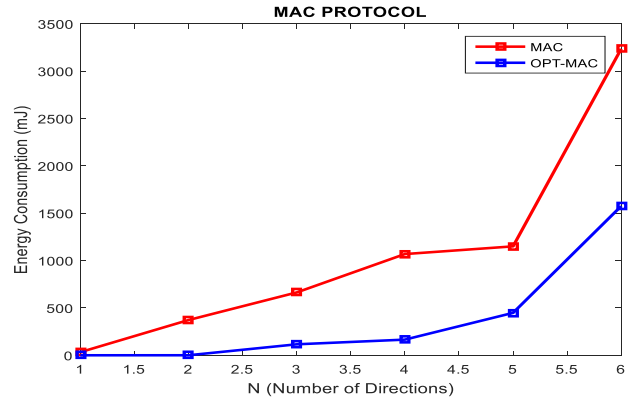


Fig.4: Comparison - Energy Consumption

The given figure described about the higher energy consumption of whole scanned stage utilising bacteria foraging optimization(BFO) and without optimization. The figure describe power consumption that occurs up to 3000 mJ and 1700 mJ. The output approach used comparing existing with proposed approach to acquire decrease data consumption related to amount of direction using digital antenna.

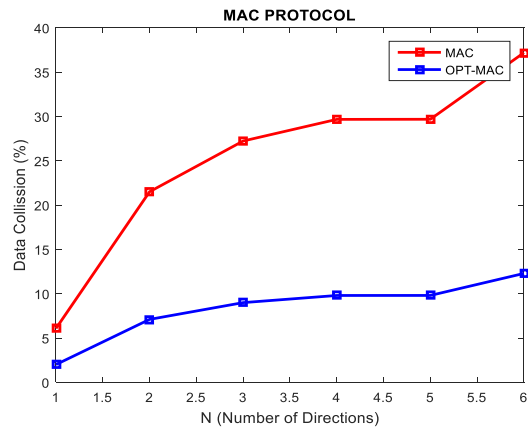


Fig.4: Comparison- Collision Rate Comparison(%)

Figure 4 described about high collision value of whole scanned stage utilising bacteria foraging optimization(BFO) and without optimization. The collision value may be less at low data packet overhead and low data packet drop possibility and it determine the given figure that collision value at less percent for utilising the proposed method.

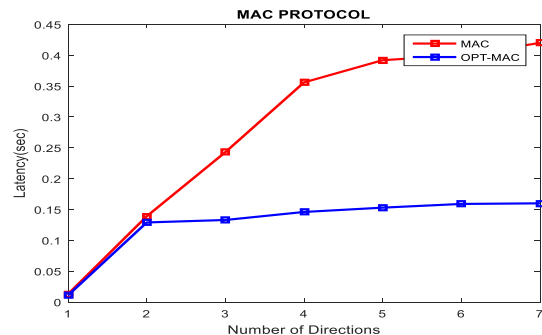


Fig.5: Comparison - Latency (sec)

The given figure describe the latency value utilising bacteria foraging optimization(BFO) and without optimization.The latency value contract end to delayin form of distribution of data packets from sender to reciever.It is observed that 0.19sec

and in absence of optimisation up to0.42sec.The end delayhave maxximum data packet that determine strength of the scheme.

Table 1 Performance Comparison table

Parameters Metrics	Exsiting (RDA) Work	BFOA proposed method
Energy Consumption	3kmJ	1700 mJ
Collision Rate	37.5%	12 %
Latency	0.44	0.20

Algorithm 4.1 – Proposed algorithm

Stage 1: Initialise

Stage 2: Adjust Y and Z

Where Y = Network Length and Z = Network Width

Stage 3: N = input (Enter the amount of nodes)

Stage 4: For I = 1 to N

 Compute Y_L and Z_L

 Where Y_L and Z_L is the y and z locations of the hops acquired by the operator

Endif

Stage 5: Set U_x for every hop

 Where U_y is the transmission energy.

Stage 6: searching the reported space where each hop

Covers the space at displacement for higher

directivity using D_y (displacement)

Stage 7: For j=1: N

 For k = 2:N

$$D_y = \sqrt{((Y_L(i) - Y_L(j))^2 + (Z_L(i) - Z_L(j))^2)}$$

 ENDIF

End For

Stage 8: If D_z (displacement) < 0 and D_y (displacement) > 5000

 Reporting area = N_{id}

 Displacement matrix = D_x

End if

Stage 9: searching the connection of the connected hop with another hop for seraching directivities

Stage 10: $B_i = B_1, B_2, \dots, B_n$

 Where B is the antenna vector utilized to recognize the way of antenna energy beam.

Stage 11: Compute the digital angles when the data signal alters.

Stage 12: If E_y is using maximum data and treatment

 Where E_y is the power consumption

 data optimized and compute power fitness values

 Data optimized with some population as length of the power array with crossover val 0.8, mutation data value with the rate of 0.05.

Stage 12: Compute the Pss depends on the routed damages

$$Pss(i) = 10 * \log_{10}(U_x(i) / P_x(i));$$

Where P_{ss} is the received data signal strength, U_{xy} is the transmit power and R_{xy} is the received power

Stage 13: compute minimum route loss for every location to compute higher data signal strength at specific locations.

V. CONCLUSION AND FUTURE SCOPE

In this research work, concluded as in MANET (Mobile Ad-Hoc Network) in terms of energy efficient using omnidirectional antennas. Initially, it has presented the overviewed to MANET with few major issues. To carry out the data transmission in between MNs (Mobile Nodes) several routing methods their followed classes had been searched. By useful of omnidirectional antenna in MANET, reduces issues of energy, throughput and overall network lifetime and many more. Mobility upgradesthe main concept of re-configuration in directional antenna so a novel algorithm and model can be described which main focuses on re-configuration directional antenna. MANET is measurement of the active concept, through imperfect network bandwidth acquiring capability and issue on data resource users, then they researched on demand. Though due to various modifications in location of active nodes, even the well managed mobile nodes may be changed in un-usable mode. For constancy routing and high throughput it has used the optimal method is implemented to achieve minimum energy and latency in rendezvous and full scanning phase using Das through which we are able to obtain minimum energy, collision and high data delivery. From above described result we noticed that our proposed method is able to receive accepted consequences with minimum error probabilities.

In future, will adding on the routing methods for MHWSN (Multiple hop Wireless Sensor Network). Several kinds of protocol used in MANET that is SN. It can implement a DSDV and BAODV protocol. In this routing protocol will work to design the route for data transfer the sufficient information as well as packets one node to another hop. It will design a SPD (Shortest Path Distance) and data deliver source to sink nodes.

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