An Integrated Approach For Energy Efficient Routing Over Ad-Hoc Network Using Soft Computing

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***Abstract*—** In the past few years, wireless communication has grown rapidly. Through these greatest feature is provided by the network without wires. Handheld devices and any user can take their place. They benefit from a small device, the long-lasting battery. The new communication standard for high-bandwidth services. For communication, the fixed network infrastructure through such is not necessary. These self-organizing network (Ad hoc networks) has received a massive interest in recent times. The most common application of wireless networks is set standard for mobile communications (GSM) and wireless local area network (WLAN). Node is not arranged in any particular manner in such a network. Therefore, in order to ensure communication between the nodes, a number of routing protocols have been developed for such a network.

In this proposed system we design the network on adoc network those have some node and we will use the artificial neural network for the training and testing the network. In this system we will give the input neuron value and set a bias value for the purpose of training of network to improve the efficiency of network. After the number of training session in network we get the less energy consumption in that particular network.

The objective of this paper work, the process of the minimum number of hops through the use of physical layer information instead of the default distance vector algorithm proposed amendments after AODV routing protocol version based routing discovery.

Keywords- *AODV, Adhoc Network, bandwidths, Nodes, NeuralNetwork.*

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I. INTRODUCTION

In the past few years, wireless communication has grown very quickly. The best feature provided by such networks is no wires. Users can take away handheld devices anywhere with them. They get benefited from small devices, long lasting batteries. High bandwidths are available from new communication standards. In order to communicate via such a network, fixed infrastructure is not necessary. These self organizing networks (Ad hoc networks) have gained interest on a large scale in recent times. The most common applications of wireless networks are Group Standard for Mobile communications (GSM) and Wireless Local Area Network (WLAN). Nodes are not arranged in any particular fashion in such networks. So to ensure better communication in between nodes, some routing protocols have been developed for such networks. Wireless networks are playing a major role in the area of communication. Wireless Networks enable the users to communicate and transfer data with each other without any wired medium. Now we are using wireless networks in military applications, industrial applications and also in personal area networks. The main difference between wireless and wired networks was only in communication channel. In wired network physical medium exists and does not exist in wireless network. In general, wireless networking devices use of infrared or radio frequency signals to transfer information and resources between devices each other. [1] Today many types of wireless devices are available such as, mobile terminals, hand-held PCs, laptops, cellular phone, PDA, wireless sensors and satellite. Wireless networks are two types first is called infrastructure based wireless networks and second is called Infrastructure less network. Infrastructure less network is also called Ad-hoc Network. Ad-hoc networks can be classified in three categories based on applications; Mobile Ad-hoc Networks (MANETs), Wireless Mesh Networks (WMNs), Wireless Sensor Networks (WSN). Wireless networks became very popular due to lots of factors such as ease of installation, reliability, cost, bandwidth, and total required Power, security and network performance.

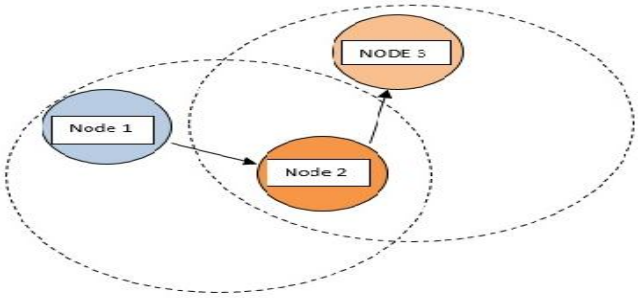

Figure 1.1:- A sample mobile ad-hoc network of three nodes

II. LITERATURE REVIEW

Mobile ad hoc networks have been around for a long time. They are less network infrastructure. According to Gita, verses "yada yada hi dharmasya glanir bhavati bharata abhyuthhanam dharmasya tadatamnan srujamy aham" Krishna religion is a need to establish that whenever he says the world will come to that. Such storms, cyclones, earth quake, and when there are natural disasters such as emergency work in the same fashion Monet comes in. this is Communication fails because in emergency situations and Manet without any fixed infrastructure helps to re-establish communication. MANETs based security is also widely believed are used in the war [1]. This known in the field, a military route is not known, and then you cannot come out of Padmavyuha. When a packet is corrupted adequate safeguards lack the same fashion, MANETs in the case, he cannot reach its destination. In mobile ad hoc network nodes maintain a significant role in ensuring secure communications rely [2]. The word "faith" in terms of reliability refers to the relationship between neighboring nodes.Trust, integrity, timeliness and Manet in the next hop for nodes to improve the reliability of the delivery of messages [2]. Trust services, mutual benefit indicates the degree expected. Safety is a concern when the network to detect the selfish and malicious nodes is very important [3]. In MANETs high level of security and the intrusion detection and continuous authentication as can be ensured by a combination of measures [4]. MANETs are used in military applications, without security, nodes enemies are vulnerable to attacks [5]. Trust management to provide security for MANETs In addition, a technique of detecting abuse. Clustering mechanisms could have an effect on energy usage and network security [5]. In the hexagonal Clustering is proposed [6]. WSN is composed of hexagonal groups, according to. Each hexagon shaped cluster, a cluster head is located. This paper cluster subdivisions that advocates energy consumption can save. It is further subdivided, and it can reduce power consumption. Such R / 2 as the radius, R / 3 and R / 4 sub-division save energy worth 50% 67% and 75% respectively. Trust for energy efficiency also can be used with WSN. In trace a centralized competence and trust-based energy, which is proposed - efficient route planning [7] the plan protects the security threats from a variety of WSNs. Improve safety by helping to detect routing protocol helps. In the WSN sink or BS is involved in the maintenance of credibility and trust, which is more knowledgeable and powerful. It also protects enough energy. WSNs to achieve energy efficiency are another aspect topology control and routing. In this proposed framework data transmission delay to eliminate the number of hops, transmission, and transmission delay and energy efficiency in terms of the offers [9]. In yet energy efficient routing protocol is the end, which is introduced - it also ensures guaranteed delivery of packets to the end of the localized path [9]. Throughput MANETs is another important aspect to be considered. Efficient data transmission node before I make it efficient and thus also helps to find a way dislocated node. More Energy consumption while it increases throughput [10]. To transmit data efficiently number (bit error rate) as this can affect throughput possible plays an important role and also causes delay in transmission. As of December traced the problem and the solution reduced the number and improves throughput Energy efficient clustering technology network lifetime of better allocation of resources and are used to improve. In an outline using less energy to achieve the maximum flow is proposed as power consumption increases data throughput is increased. WSN clustering also reduce power consumption. In based algorithm is proposed for saving energy -Power transmission

III. OBJECTIVE OF OUR WORK

In this proposed system we design the network on adoc network those have some node and we will use the artificial neural network for the training and testing the network. In this system we will give the input neuron value and set a bias value for the purpose of training of network to improve the efficiency of network. After the number of training session in network we get the less energy consumption in that particular network.

IV. PROPOSED WORK

Routing in mobile ad hoc networks is a major challenge. Most are battery-powered devices in the MANETs that is stated in the literature. Battery power is an important resource in MANETs. The lifetime of the network nodes in network depending on the power consumption. Manet nodes efficiently routing algorithm should consume battery power.
In MANETs the power consumption of the data transfer will depend on the performance of routing algorithm. Many algorithms for solving this problem have been proposed in the literature. The nodes can be saved if the power is not required to optimize routing algorithm has been observed.
The research nodes in an effort to efficiently use battery life that is to find an optimal way. Genetic heuristic optimization algorithm can be used to solve problems. This research using genetic algorithm of a new power-aware routing protocol is proposed. The new algorithm which tries to deal with two problems is:

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1. Low power consumption in the data transfer between the nodes of the net to find efficient ways.
2. To provide other paths when one route get failed because of the mobility problem of mobile adoc networks.

The pseudo code for the proposed algorithm is as follows:

STEP 1: First of all we will find all the rote which is possible.

STEP 2: For each node of each route we will Calculate the TE_{node}.

STEP 3: Until route is not available for transmission of packet we will try to check the given below condition.

If (TE_{node} >= RBE)

Keep the node into the pause mode.

Else

All the nodes are being selected which is active.

End

STEP 4: For all chosen path find the transmission Energy.

STEP 5: Find the efficient energy path based on minimum all transmission energy of route.

STEP 6: For every node find the train value data set.

STEP 7: Move on STEP 3.

STEP 8: End.

In back propagation first of all we generates all the possible routes after that calculate the TEnode for each node of each route. After that calculating TEnode we check the below conditions for each route till no route is available to transmit the packet, If (RBE=TEnode) Make the node into sleep mode. Else select all the routes which have active nodes. END then calculate all transmission energy for all the transmission energy for the entire selected route after that select the energy efficient route on the basis of minimum total transmission energy of the route and we will also calculate the Train data set value for each node of the selected route. Then we will follow above conditions at every stage.

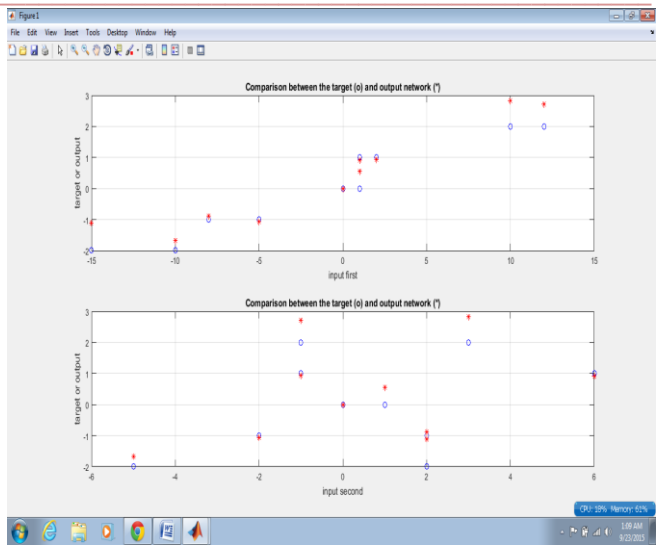

Figure 1.2:- Comparison between the target and output network diagram

In the above diagram we have taken two different input (input first & input second) which having different values and graph. Also in the above diagram there two different network in which blue dot shows the minimum energy level and red dot shows the maximum energy level, this happen only when the route are changes.

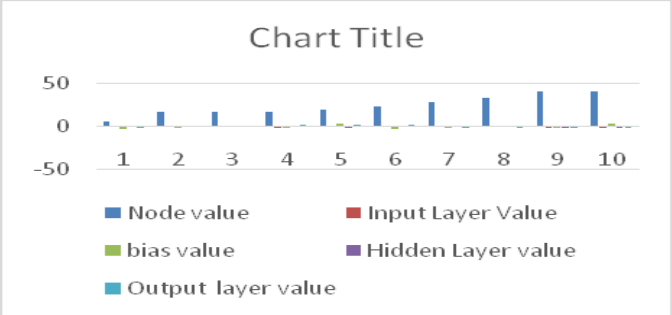

Figure 1.3:- Performance chart by the Back propagation Algorithm for energy efficiency routing

Node value	Input Layer Value	Bias value	Hidden Layer value	Output layer value
5.9937	0.0237 0.5662	-3.3781	0.8315	-0.3478
16.0778	0.2318 -0.0182	- 1.2085	0.5844	0.1819
16.0779	0.1948 0.3088	0.1378	0.9190	0.1612
16.0779	-0.1602 -0.4114	- 1.5999	0.3115	1.3858
18.7176	0.2287 -0.0933	3.5203	-0.9286	1.9411
20.7234	0.1353 0.6534	-3.3574	0.5840	1.4096
24.3526	0.3187 -0.0128	-1.1578	0.5246	-1.7702
28.6753	0.3226 0.2677	0.2930	1.0792	-1.7647
39.9700	-0.1597 -0.4164	-1.5917	0.0050	-1.8211
39.9700	-0.1463 -0.0601	3.5440	-0.6094	-1.8257

Table 1.4:- Performance chart by the Back propagation Algorithm for energy efficiency routing

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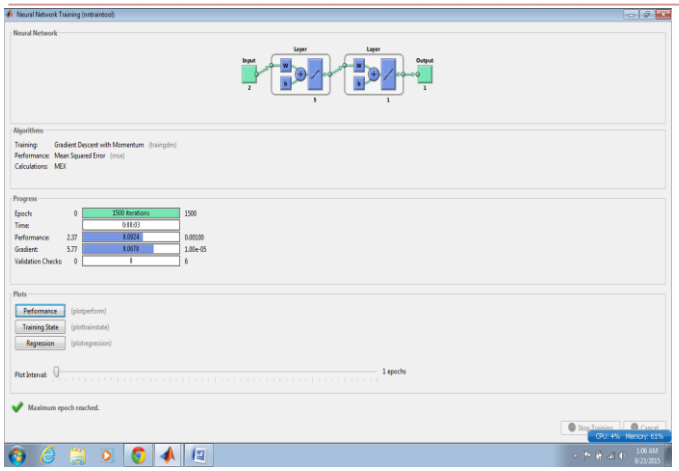

Figure 1.5:- Performance diagram

a) A. Plot the Neural Network Training performance graph.
b) B. Plot the Neural Network Training state graph.
c) C. Plot the Neural Network Training Regression graph.

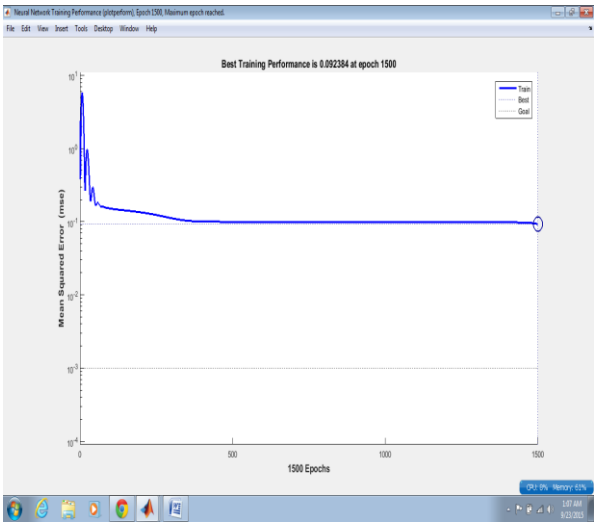

Figure 1.6:- Training Performance diagram

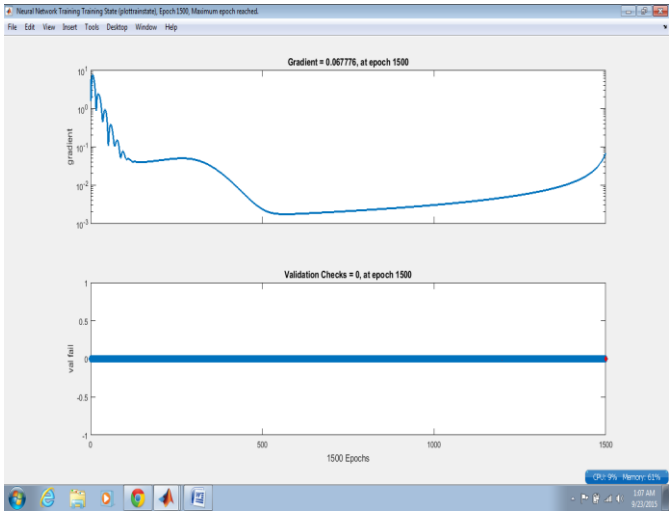

Figure 1.7:-Training state diagram

In the above graph which shows the training set of network that can be defined the energy efficiency of the neural network.

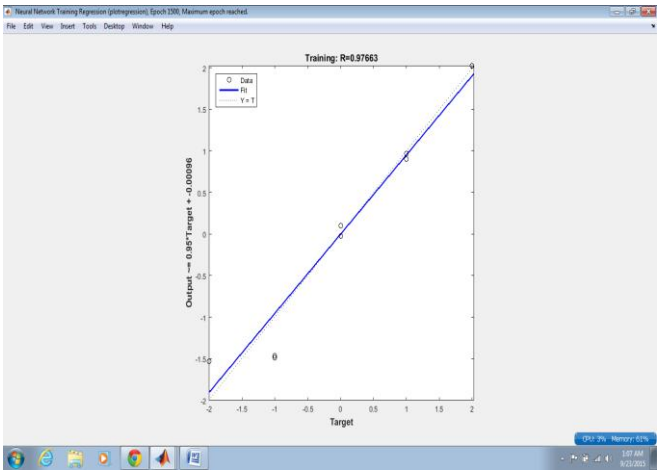

Figure1.8-Training Regression diagram

V. IMPLEMENTATION AND RESULTS

In this implementation, these 1000 nodes are divided into 500 adoc. A class information node stores information about all nodes, such as its node number, its number and its neighboring countries and other neighboring node list.

Transport packets from the source to the destination proposed by the average number of active back propagation transport energy less. Let their ADHOCS and 30 nodes in the network. Through experiments, we have found that, because there are fewer nodes in the network is not active node and energy consumption is very small. As there is no increase in the number of nodes in the active node and the energy consumption is also increased.

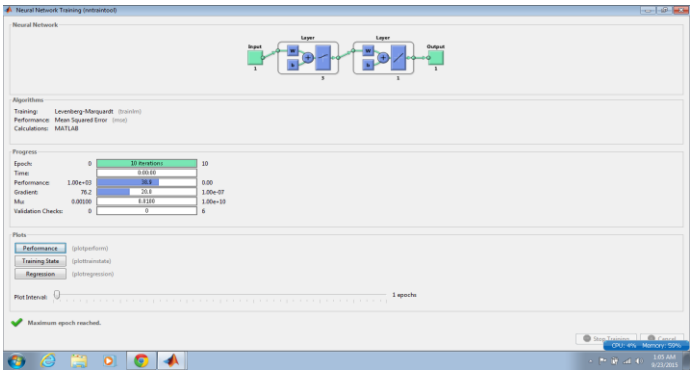

Figure 1.9:-Neural Network Training diagram

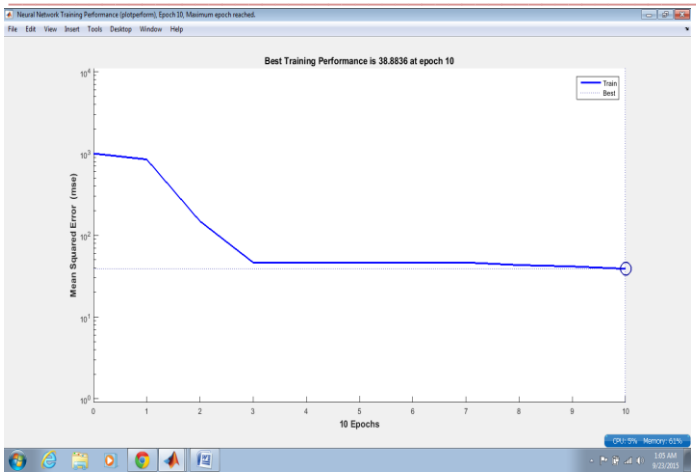

Figure 1.10:-Neural Network Training Performance diagram

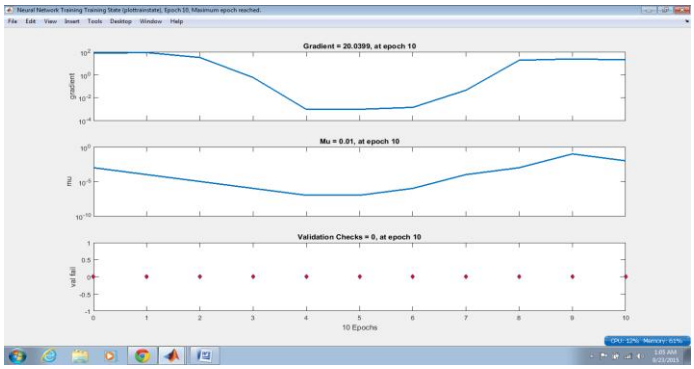

Figure 1.11:- Neural Network Training state Diagram

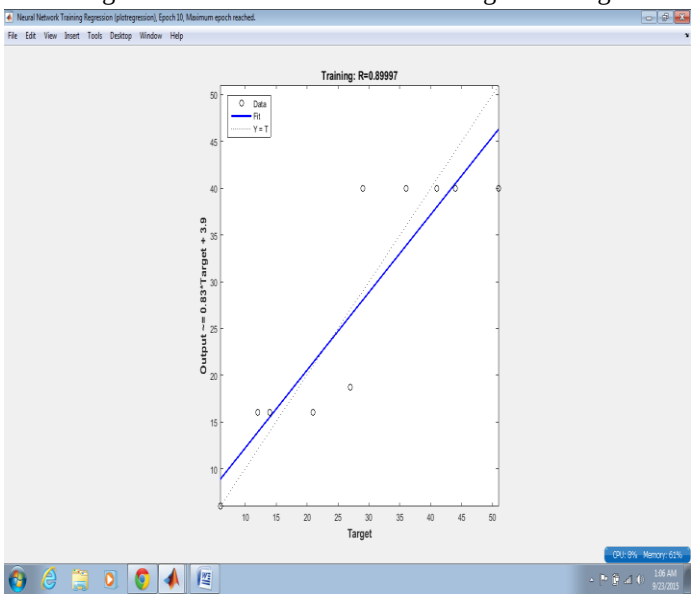

Figure 1.12:- Neural Network Training Regression diagram

VI. CONCLUSION

The new algorithm using back propagation algorithms have been proposed to find the saving in wireless ad hoc network routing protocols. The algorithm for the initial input network for the transmission path from the source data to the destination. The algorithm provides us with a set of paths, transmit data packets from the source to the destination. It can be concluded that the back propagation algorithm can be effectively work on Manet's best path to transmit data packets to be found in power usage nodes. The algorithm not only provides us with the best path, but also a list of paths consuming power than the best of the best path slightly. As wireless ad hoc networks are dynamic, so the link between the two nodes may be broken at any time. In this case, an alternative route can be used to transmit data packets. Therefore, algorithm inherently more reliable.

VII. FUTURE WORKS

The future work of this proposed algorithm is that to work on genetic algorithm and fuzzy logic system and it also work on more complex network and improve the more energy efficacy of the Adoc network.

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