Journal of Engineering and Applied Sciences 13 (14): 5932-5941, 2018
ISSN: 1816-949X

Exploring Node Perceptive Routing in Mobile Ad Hoc Network Use Location Pursuing Algorithm

J. Wilson and Kamalraj Subramaniam
Department of Electrical and Computer Engineering (ECE),
Karpagam Academy of Higher Education, Coimbatore, India

Abstract: Mobile node operate as gateway node for packet transmission, those gateway nodes there is a lot of chance to misroute the packet from starting point to ending point. It affects the communication and more time taken to analyze the misrouting also discovers a new routing path. Battery of each node is drained in every data packet transmission along gateway nodes present in path. Proposed Exploring Node Perceptive Routing (ENPR) handles misroute packet transmission and easy to achieve best route. The relay nodes are allocating false route to source node. False route allocation is initially identified by applying the location pursuing algorithm. This algorithm is supported to monitor the misroute node location based packet transmission, pursue node act as gateway node to allocate packet transmission in correct routing path. False path allocation is removed and establishes the correct routing path, it is a single path because multi path utilize more resources. It reduces energy consumption and improves detection efficiency.

Key words: Exploring node perceptive routing, location pursuing algorithm, false path identification, consumption, misroute, analyze

INTRODUCTION

Multi hop in MANET are analyzed and nodes are arranged in network environment. Mobile network there is no dissimilarity among sender and receiver node because each nodes are operate as sender sequence of intermediate node cause packet overload. Additionally, each mobile network mechanism can be portable. Mobile network distinguish from conventional, placed mobile nodes that movement speed, moves through entire network. Even though problems like location organization happen in the final, centre network process are not unnatural (Beaulieu and Soliman, 2012). Network need basic modifies to straight communication with data broadcasting rules for each single cast and many cast packet transmission. Conservative communicating scheme that is depends on sender containing the dispersed state about the network statistics that are constructed for connected networks should operate in constant environment.

Though, condition updates in mobile network can be very recurrent, making conventional routing schemes each ineffective and costly (Zhong *et al*., 2010). While it become comprehensible that sector orient packet transmission is one of the key request programme in mobile network environments, amount of mobile network multicast communicating conditions is present (Salhab *et al*., 2013). Those conditions are divided based on dual various characteristics. Initial section containing communication conditions and classify routing methods into two categories: practical and automatic.

Practical conditions preserve transmission situation whereas the automatic minimize the collision of recurrent topology modifications by acquire paths on command. The next principle divides conditions based to the universal data environment need to broadcast many packets. Previous schemes are tree else interconnected one (Win *et al*., 2009). Allocate many communicating scheme, tree-depending condition construct routing hierarchy against that broadcast data packets frequently. Even though higher transmission rate better, hierarchy conditions not provide sufficient strength. Assured key character of mobile network like quick arrangement, it is perfectly applied to significant network; Anywhere strength and dependability are necessary. The vital confront for multiple packet broadcasting in mobile network is require to achieve strength in the attendance of general speed and common node transmission (Renzo and Lu, 2015a, b).

Connection based scheme construct a network for broadcasting multiple data packets and talk to strength and trustworthiness needs with route error inbuilt to

Corresponding Author: J. Wilson, Department of Electrical and Computer Engineering (ECE),
Karpagam Academy of Higher Education, Coimbatore, India

mesh. Aim of the process is to discover intend freedom of multiple broadcasting in mobile network (Renzo and Lu, 2015a, b). In particularly, one of the aim to monitories the behavior of network environment, nodes advantages of connected network and hierarchy mechanism for a high level of mobile network schemes should cause suggestion for better path selection to specific mobile network situation. Experimental setup utilizes a extensive level of velocity and overload situation as well as various multiple broadcasting sector description (Aalo *et al*., 2014a, b). To survey distinguish the characteristics of the ODMRP-On-Demand Multicast Routing Protocol is indicated for connection based scheme over MAODV-Multicast Ad Hoc On-Demand Distance Vector representing tree-based methods. Each condition is belonging to the automatic sector. In comparison, packet dropping, questionably the best and earlier connection based communication scheme. Even though the hefty overload, it gives the better rescue guarantee for broadcasting in packet drop, error in packet transmission should grounds severe argument and crash issues in mobile network (Aalo *et al*., 2014a, b).

Literature review: Pongaliur and Xiao (2014) presents Minimum cost MFDSS-Multi-Fusion Based Distributed Spectrum Sensing method in a mobile ad-hoc next client system to conquer the aforesaid issues. It accepts all next clients to organize semi-global data to make decision in a dispersed method. It uses outlier discovery with data combination to reject mistaken sensing data created by complex damage. Standing in sequence of the nodes is used to contain a SSDF intrusion. It incorporates a status transmission and combination method to avoid misbehaving nodes from beating following updating scheme and to sustain the bloom of the standing data's. Moreover, it includes an incubation time to dishearten nodes from altering individuality to execute a Sybil intrusion or to facade a terrible standing. Complete investigation is obtainable and the experimental output indicates the important development in perfect main user range tenancy classification.

Abbas *et al*. (2013) proposed Sybil intruder should be moreover produce maximum individuality on a single substantial node sequence to initiate a synchronized intrusion on the network else can control identity in sequence to decline the identification method in that way encourage need of responsibility in the mobile environment. Present an inconsequential method to notice the latest identity of Sybil intrusions lacking using central trustworthy node or any extra node, like a directional antenna or a environmental position network.

Lee *et al*. (2016) propose an efficient and effective scheme, RPM -Responsive Probing Mechanism is used to regularly insert query data's into normal data stream broadcasting for the active discovery of malicious nodes. Additionally, a display based on the worth of query packets broadcasting is launched to calculate the extent of malicious nodes. Experimental outputs indicate that the present RPM performance is better than the previous scheme, effective discovery and lower estimate charge.

Cheng and Heinzelmman (2004) presents method to decide the improve lifespan of every paths at with its length. To evaluate these improved lifespan paths with usual chance minimum distance path and expose the deal of using increased lifespan paths of various durations. All the basic outputs will hand out as the directive for further construction. Experimental output is signal power times past based connection lifespan evaluation. Different most of the signal strength based estimation schemes that use ideal wireless spread scheme, a more sensible wireless spread method with each quick and unhurried declining is occupied into description. It minimize the unfavourable belongings from quick declining, signal history are needed. The next section is to construct a spread method to enhance network lifespan in particular routing path.

Palma and Curado (2013) proposed an option routing method which suitably analyze the velocity of router node between various situations, major grouped wireless networks are constructed with a better gateway assortment with overload handling schemes. This technique uses a virtual pecking order of groups to explore the contextual-proximity of mobile nodes when minimizing the total transparency of communication overload still while distinguish with previous group based methods. Furthermore which are suitable forecast intermediate connected disconnections, improving the entire quantity of received data packets. Simulation output shows the disclose that this communication method performance analyzing of previous routing methods despite of the velocity prototype organism used individual constantly lighter in transparency and deliver high packet overload. Simulation output encourage a latest wireless multiple relay nodes in network suitable for hand-held strategy exchanging data surrounded by it.

Egbogah *et al*. (2012) present a heuristic scheme is known as JPA-joint link node power allocation which assigns energy depends on the attendance of connected nodes in network. The monitored mathematical output, to detect that present scheme obtains energy usage is

minimum of the best result, except considerably minimizes the output difficulty from exponential to polynomial by utilize time gap for minimum packet transmission than the better result to join to a lesser energy usages. The main aim to monitoring the presentation evaluation of this scheme is achieve better transmission rate with minimum packet latency, the nodes depends on the attendance of connected nodes obtains minimum energy usage with efficient path allotment by using OPA scheme. Advantages are provides minimum complexity distinguishes with previous scheme.

Maleki *et al.* (2014) presents RTLB-DSR-Real-Time Load Balancing Dynamic Source communication, a dynamic source based load managing communication which gives QoS in the network among a various service scheme along best attempt with data forwarding. Experimental output indicates that QoS advantages minimum packet drop and packet latency time in proposed routing scheme. An effective graph-based scheme which enables applies varied communication rules to dynamic source routing condition, support of classifier part that are divided to network, packet broadcasting with better process. It needs more effort to broadcast packet in stable routing path to reach their target node earlier than particular coverage range. Present scheme indicates the best-routing path to manage the packet overloading.

Mandhare and Kadam (2016) present security based method is determined. To provide routing path as better and efficient for packet broadcast between sender node through allocated path to target node in network environment. This scheme supports authorize nodes not only transmit the data packets except in addition keep the route trustworthiness. Confidential gathering maintain security updating and node capacity analyzing. Each nodes which are actively working in the network they are get compensated. To establishes trustworthy and best route among mobile nodes in network infrastructure.

Bagayoko *et al.* (2016) present process re-establishment with automatic method is the most appropriate in mobile network. The next inspiration of the paper scheme is an systematic survey of the communication security at the network many path allocation and its interest in terms of re-establishment time with trustworthiness. Merits of path error in terms of re-establishment based on the prospect that rotate path are organization after the main path damage. Priority is surveyed, according to the used connection preservation methods are LLF-Link Layer Feedback acknowledgements, Request packet messages and network-layer reply packet.

Remya and Lakshami (2015) present observe though that network capability remainder considerably underutilized by pattern mobile network communicating scheme at this degree of operation. Consequently instead of characterize the scaling border for mobile network transmitting in terms of ability, it analyzes packet sharing between the sender and receiver of path damaged and of path revamp. It guide to the detection of the revamp time scale that is used to describe the experimental scaling ranges in mobile network. The shock of revamp instance scaling partition on mobile network is recognized.

Hu *et al.* (2016) presents effects of transmitting energy usage, route damage advocate and spatial thickness of interferers on the presentation of dual-hop network are found. It is exposed that the outage prospect of all hop as a purpose of reserve, broadcasting energy range has dissimilar crash on the point to point outage chance. The outage chance ground is unoriginal while broadcasting energy ranges at the sender and gateway node count is high. The better energy allotment for the dual-hop connection is achieved. The characteristics of the outage chance during the transmission process among the affecting nodes are surveyed. The experimental output is authenticating with allocated routing path.

Gambhir and Sharma (2013) proposed protection intrusion than straight connected and unconnected nodes in network. The protection of AODV technique is authority by misbehaviour node intrusion. A misbehaving node inserts a wrong route acknowledgement maintain to contain minimum distance and quick transmission path to target node. Though, while the data packets appear, the misbehaving node rejects from network. To avoiding attacker node by applying proposed prime product Number scheme to detect and reject misbehaving node in routing path.

MATERIALS AND METHODS

Overview of proposed scheme: Mobile network single path routing sometimes, relay node assigns misroute to sender node. This node broadcast data packets frequently with support of lot of intermediate nodes present in the routing path. Present exploring node perceptive routing method efficiently blocks the misroute communication among source node to destination node. Those misrouting makes network as more energy consumption with packet drop is also improved; It is reduced by applying ENPR method. Normally path allocation focuses the appearance of node that means current location of node. Relay node operate as gateway node it is hacked by various hacker, the relay node process is controlled and manage by unwanted out of network node. Hacker node allocate the process schedule, it should follow the hacker

node allocation. So, packet transmission is misrouted to obtain packet loss. The energy level of each node is reduced in every time to make imperfect data packet transmission.

Present exploring node perceptive routing method support to detecting misroute from source to destination, general case single path routing is better one for reducing energy consumption. But this network misroute cause single path routing makes more packet loss. Location pursuing algorithm tracks the vnode location which specifically, monitor the misroute such relay node. Pursue node is launched to collect that data packet and forward to another intermediate node. It reduces energy consumption and packet drop rate.

Figure 1 shows the block diagram of exploring node perceptive routing method. Relay node is responsible to allocate routing path from sender node to destination node, wrong route is assigned to sender node and it makes failure in packet transmission that are identified by exploring node perceptive routing method. Location pursuing algorithm assigns the best route to target node. It minimizes energy consumption and packet drop rate.

Path allocation to source node: Route assigning is based on time scheduling to construct point to point communication routes among source to destination node. The worth of node is based on the kind of assignment that is processed and the range of node velocity to move along any direction. Minimum distance path allocation is not efficient for this packet transmission. Every node in path advertise and send request to source node like ready to transmit data packets frequently, it initially only check minimum distance relay node and broadcast packet through the linked nodes from sender node to target node. These requests are broadcasted through the path which node act as sender for particular time period not yet routing is completed. While the neighbor node accepts the original packet, it provides acknowledgement packet to sender node.

The relay node along with each relay node along the repeal route, this reverse route only allows acknowledgement packets. The route starts from destination node to source node. While an acknowledgement packet from each relay node is accepted by the sender node available in routing path. Specified route contain an intermediate node in routing path from relay node to the target node, amount of packet successfully transmitted to target node is also analyzed. Some situation the destination nodes increment its communication rate and if any failure retransmission is allowed but more energy is consumed for its performance evaluation. Assume e_n is energy usage for sender to receiver node:

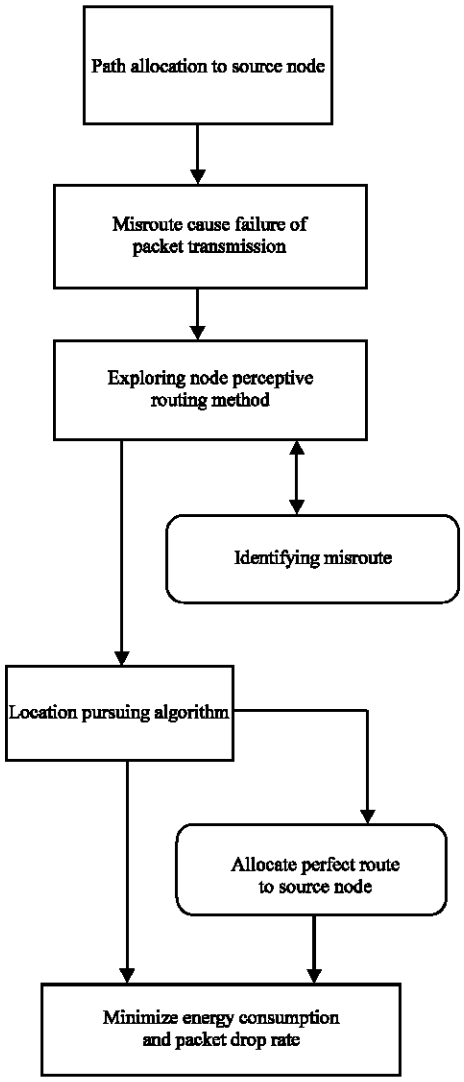

Fig. 1: Block diagram of exploring node perceptive routing method

$$e_n = \sin^{-1} sr \quad (1)$$

The procedure is continued awaiting the destination node should construct the best routing path. While the highest communication authority range is obtained lacking each situations being met, the destination node again build the communication power range to the lesser and resume the path finding procedure. Task of assigned power ranges are designed to perform packet transmission in the initial part, it operates the minimum energy path assigning scheme to decides the communication power range for all communicating node like gateway nodes in routing path. That communication power ranges are maintained in packets which are broadcasted by the

sender to all relay node in the network environment. All broadcasting node which accepts the data packet locate their communication power range limits allocated to each node that contain packet informations. SL is location of sender mobile node:

$$s = \lim_a SL \tag{2}$$

The lesser network energy usage is estimated. Initial parts, nearby neighbor nodes are finding to arrange routing path from source node to destination node. Next part, identify the overall lesser energy usage for communication among route. Mobile ad hoc network all nodes are linked represented by routing link, it acts as gateway node. It contains an overall nodes in the network anywhere it is located and behavior are analyzed. Every node coverage distance is monitored after decide the routing path. RL is location of receiver mobile node:

$$r = \lim_a RL \tag{3}$$

Overall energy usage within a relay node is estimated by formative the less power range need for transmitting their data packets to the destination node. Dissimilar the communication that performed among mobile nodes, then to fix point to point packet delivery ratio purpose within the coverage range, packet delivery ratio there are no packet failure before the data packet is broadcasted to other neighbor node. Because, wants the point to point packet delivery ratio through relay nodes is estimate the point to point transmission rate for inter-packet sharing through link established between source node to destination node. Without failure that means no misroute obtains high packet delivery rate. Consider $\hat{e}\left(^{\min_x y}/_{\max_x y}\right)$ is minimum and maximum possibility of mobile node, Rcount is receiver node count range and Scount is sender node count range:

$$SL = \hat{e}\left(^{\min_x y}/_{\max_x y}\right) * Scount \tag{4}$$

$$RL = \hat{e}\left(^{\min_x y}/_{\max_x y}\right) * Rcount \tag{5}$$

Packet latency is measured in bits per time unit over connection between sender to target node packet are waiting in a queue at gateway node, each gateway node amount of packet transmission is noted and analyze the greatest energy level node present in routing path. The relay node capacity is monitored to provide link connection between starting to end node. Main goal is reducing the entire network energy usage need for packet sharing in the allocated routing path. Each link among node packet latency is noted based on allocated time slots from starting to end point.

Exploring node perceptive routing method: Monitoring node after allocating the best routing path which contains less energy to transmitting data packet, packet delivery ratio is high for receiving those packets depending on link between mobile nodes. Perceptive routing describe link connection for node as a node in the routing path uses more than one links from sender nodes broadcast data packets to the destination node in mobile network. The amount of source nodes linked to a gateway node without their point to point packet delivery ratio purpose meet is indicated to as the influence of the gateway agent. Condition of a link node influence is always originally better one:

$$sr = \lim_\alpha SL * \lim_\alpha RL \tag{6}$$

Present scheme detect the misroute of packet from source node to target node energy allocation partiality to connect nodes for some situation: assigning energy to connect node concurrently enhances the node to node packet delivery ratio of several paths while assigning energy to unconnected nodes it is vital to increase packet delivery ratio of individual route. Communicating routes assemble the point to point packet delivery ratio is aim and extra energy is needed to assign to each connected nodes and unconnected nodes sequence for the packet delivery ratio is intention for all route is succeed assigning energy to the connected nodes prior to the unconnected nodes should need minimum overall network energy usage it permit the point to point routes to convene the packet delivery ratio is better:

$$sr = \lim_a \int SL * RL \tag{7}$$

Broadcasting nodes in a routing path are initially allocating a failure to pay energy range of limits that should not be more sufficient to convince the node to node packet delivery ratio aim. Experimental output, it is essential to improve the energy range of all broadcasting node in the communication path not yet reaches the fulfilled transmission rate. It choose and that node present in the routing path contains its energy range is improved, it decide the packet delivery ratio increase a node connection consider whether its energy range is improved by single path available in mobile network. Though, decide the packet delivery ratio increase by already including influence of connected nodes:

$$sr = \lim_a \int \hat{e}\left(^{\min_x y}/_{\max_x y}\right) * Scount * \hat{e}\left(^{\min_x y}/_{\max_x y}\right) * Rcount \tag{8}$$

Proposed exploring node perceptive routing method is applied to mobile network, identify misroute of packet

based on location pursuing algorithm. The difficulty of the location pursuing algorithm is considerably low when compared to the computational difficulty of this method. It indicates the new scheme the minimum complexity of the LP-Location Pursuing, it improves packet delivery ratio and reduce packet latency. The maximum amount of energy range with number of nodes visited to perform packet transmission. This method contains grouping of same energy range nodes is estimated for each nodes in order to resolve the energy allotment it generates the lesser energy usage network when also gathering the point to point transmission rate restriction.

In ENPR scheme all connected node else unconnected node contain packet transmission path from starting point to ending point in route, it misrepresentation on various path they are avoided only choose a particular connection with high packet delivery ratio path. It is a single routing path with nodes is using only minimum energy level they are tightly connected with each other in network environment. Misrouted path drop packet they are controlled and assign process by hacker node which is present in out of network. The hacker node needs essential details of communicating node available in mobile environment. Once data's are blocked, it is not broadcasted to destination node in available routing path. Lot of resources are wasted in every time:

$$sr = \lim_{\alpha} \int \hat{e}\left({}^{\min_x y}/_{\max_x y}\right) * (Scount * Rcount) \quad (9)$$

Each and every transmission is sincerely noted and behavior of each node is extract monitored to take better output. It perspective the nodes link and transmission rate, so, it is easy to identify the hacked nodes that are controlled by external network nodes. It is not present in routing path. It improves transmission rate and reduce packet latency for allocated routing path. Single path communication is better choice for source to destination node, easy to find abnormal behavior nodes.

Algorithm 1; Exploring node perceptive routing algorithm:

Step 1: each node analyzes the neighbor node behavior
Step 2: for sequentially broadcast data packets to destination node
Step 3: if {Sender = correct route}
Step 4: perform packet transmission
Step 5: else
Step 6: if {Sender = misroute}
Step 7: perform imperfect packet transmission
Step 8: misroute identified
Step 9: goto location pursuing
Step 10: select perfect packet transmission path
Step 11: end if
Step 12: end for

Location pursuing algorithm: Location of node makes the packet transmission failure initially hacker node analyze the position of each mobile node. In simulation gateway nodes need to broadcast minimum packets, then packets are not in waiting state. Whether, the quantity of the current packet overload is distinguished with the entire network overload, it not go above a particular fixed value, broadcasting this section of packet overload among the minimum distance route is high speed and secure. Consider that a control permit scheme manages the constant packet transmission. The overload managing scheme is not support to limit the packet drop, those condition must reduce extra overhead because location pursuing algorithm is applied:

$$e_n = \sin^{-1} \lim_{\alpha} \int \hat{e}\left({}^{\min_x y}/_{\max_x y}\right) * (Scount * Rcount) \quad (10)$$

The gateway nodes must not need to transaction with more overload and it broadcasting packet pursue node moves near to misroute node, it upload minimum size of data packets among minimum distance path, it should minimize energy consumption. Present the ENPR method is efficient to perform communication in abnormal situation of mobile nodes in continuous manner. Link layer supports to provide better link connection, the updated information is stored in each node routing table, the nodes perform packet transmission at high speed, so, energy usage is reduced in every time slot.

Algorithm 2; Algorithm for location pursuing:

Step 1: location of every node is monitored carefully
Step 2: if {Location node = pursue}
Step 3: misroute is removed
Step 4: pursuing node collect the misrouted data packets and upload to next neighbor node
Step 5: else
Step 6: if {Location node! = pursue}
Step 7: sender perform normal routing
Step 8: reduce energy consumption
Step 9: improve Packet delivery ratio
Step 10: end if

Pursue is more active node it acts a gateway node, it avoid misroute packet transmission, it allows only direct communication in allocated routing path. So, it achieves better result to overcome those overload and its side effects size more resource utilization. It enhance packet delivery rate and reduce energy consumption.

Packet format: Packet Format has all mobile node essential information. Furthermore, node's position information with node behavior is analyzed.

In Table 1, the proposed ENPR packet format is shown. Here the source and destination node ID field

Table 1: Proposed ENPR packet format

Variables	Values
Source ID	4
Destination ID	4
Path allocation to source node	3
Exploring node perceptive routing	5
Location pursuing	5
Minimize energy usage	3

consumes 3 bytes. Third one is path allocation to source node carries 3 bytes. The stable routing path is allocated but it is single path, so, it consume minimum amount of energy for source node to target node. In fourth field takes 5 bytes. Exploring node perceptive routing obtains better routing path, it easy to analyze the characteristics of each node. In fifth carries 5 bytes, location pursuing, it launches pursuing node to gather data from misrouted node and upload those data packets to correct routing path. Final filed is minimize energy usage carries 3 bytes, it depends on resource utilization for each packet transmission from starting node to destination node.

RESULTS AND DISCUSSION

Performance evaluation

Simulation model and parameters: The proposed ENPR is simulated with Network Simulator tool (NS 2.34). In our simulation, 100 mobile nodes deployed in 1130×930 m^2 region for 17 msec simulation time. All mobile nodes deployed in random manner among the network. All nodes have the same transmission range of 250 m. CBR Constant Bit Rate provides a constant speed of packet transmission in network to limit packet traffic rate. AODV Ad hoc on demand Distance Vector routing is used to analyze secure communication, ENPR method easy to find misroute and allocate perfect routing path is obtains improved detection efficiency. Table 2 shows simulation setup is estimation.

Simulation output

Simulation result: Figure 2 shows that the proposed ENPR method provide the correct routing path, misroute is identified and removed, so, efficient communication is achieved compared with existing OPA (Hu *et al*., 2016) and PPN (Gambhir and Shrma, 2013). ENPR contains location pursuing scheme, it have pursue node work as gateway node it collect the data packet from misroute node and upload those data packet to routing node. It increase detection efficiency and minimize energy consumption.

Performance analysis: In simulation to analyzing the following performance parameters are using X graph in NS 2.34.

Table 2: Simulation setup

Estimation	Values
No. of nodes	100
Area size	1100×950
Mac	802.11 g
Radio range	250 m
Simulation time	23 msec
Traffic source	CBR
Packet size	150 bytes
Mobility model	Random way point
Protocol	AODV

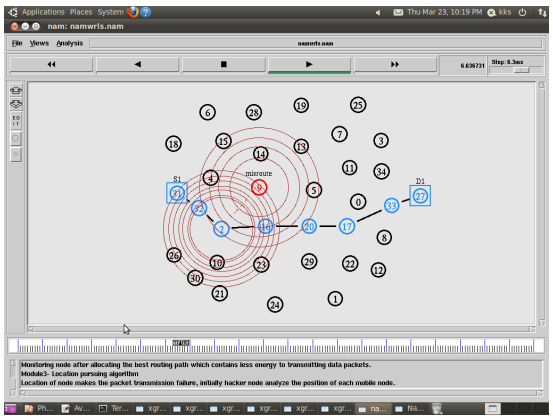

Fig. 2: Proposed ENPR result

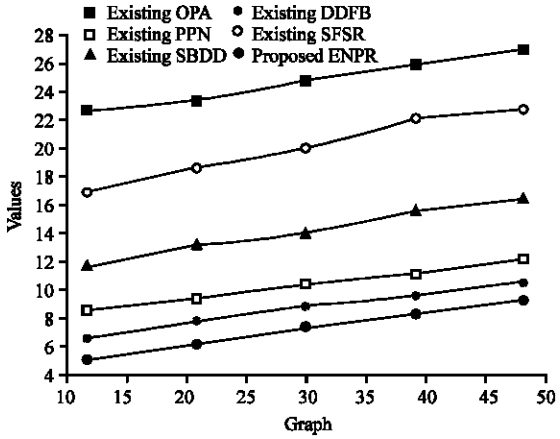

Fig. 3: Graph for mobility vs. average delay

Average delay: Figure 3 shows average delay that is calculated by time taken to complete packet transmission among source to target point, behavior of each node is analyzed. Location pursuing algorithm have node it collect and upload data packet from misroute node to correct route node. In proposed ENPR method average delay is minimized compared with Existing methods OPA, SBDD, PPN, DDFB and SFSR:

$$AverageDelay = EndTime\text{-}StartTime$$

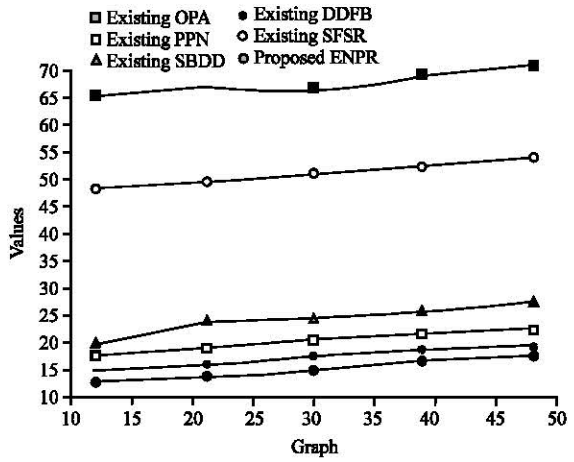

Fig. 4: Graph for mobility vs. network overhead

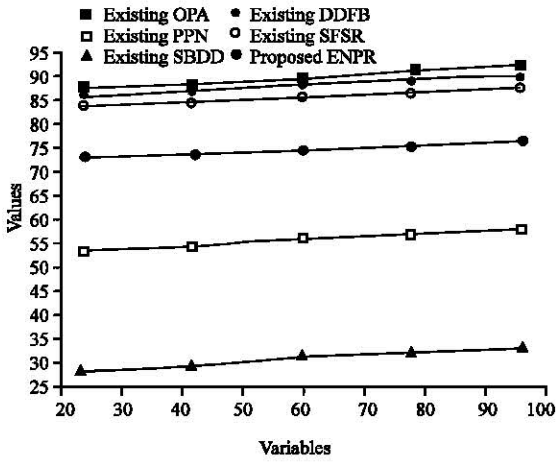

Fig. 5: Graph for nodes vs. packet delivery ratio

Network overhead: Figure 4 shows network overhead is calculated based on quantity of packet losses and quantity of packet get received successfully, location pursuing scheme allocate correct path to perform communication between sender to destination node. In proposed ENPR method network overhead is minimized distinguish with Existing methods OPA, SBDD, PPN, DDFB and SFSR:

$$\text{Network overhead} = (\text{Number of packet losses} / \text{Received}) * 100$$

Packet delivery ratio: Figure 5 shows packet delivery ratio is estimated by amount of packet received from amount of packet sent in particular rate. Speed of node is constant in sensor network; Simulation rate is fixed at 100. In proposed ENPR method packet delivery ratio is increased compared with existing methods OPA, SBDD, PPN, DDFB and SFSR:

$$\text{Packet DeliveryRatio} = (\text{Number of Packet received} / \text{Sent}) * \text{speed}$$

Detection efficiency: Figure 6 shows that detection efficiency is estimated amount of time taken to detect the misroute packet along network, location pursuing scheme supports to gather data misroute data packets. In proposed ENPR method Detection efficiency is increased distinguish with Existing methods OPA, SBDD, PPN, DDFB and SFSR:

$$\text{Detection efficiency} = \text{Attack detection time} / \text{overall time}$$

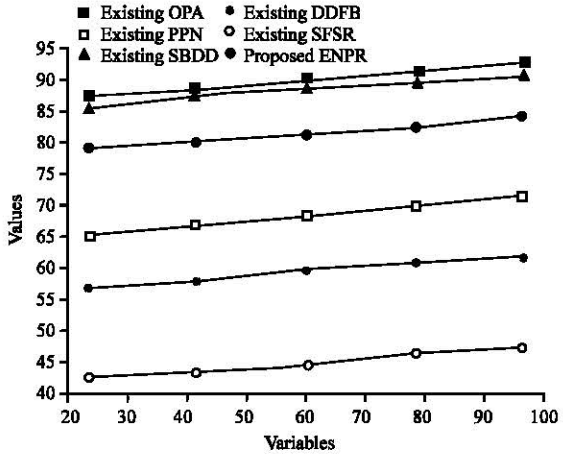

Fig. 6: Graph for no. of nodes vs. detection efficiency

Energy consumption: Figure 7 shows energy consumption is calculated by amount of energy utilized to perform packet transmission from starting point to ending point. In proposed ENPR method have location pursuing scheme it immediately find the misroute and give the perfect routing since, routing use minimum energy distinguish with Existing methods OPA, SBDD, PPN, DDFB and SFSR:

$$\text{Energy consumption} = \text{Initial energy} - \text{Final energy}$$

Packet loss rate: Figure 8 shows that Packet loss of all transmission in network is estimated by nodes loss the packet since data packet is in overload, location pursuing algorithm is used to achieve correct route, it supports collect data from misroute node. In proposed ENPR method Packet loss rate is reduced distinguish with Existing methods OPA, SBDD, PPN, DDFB and SFSR:

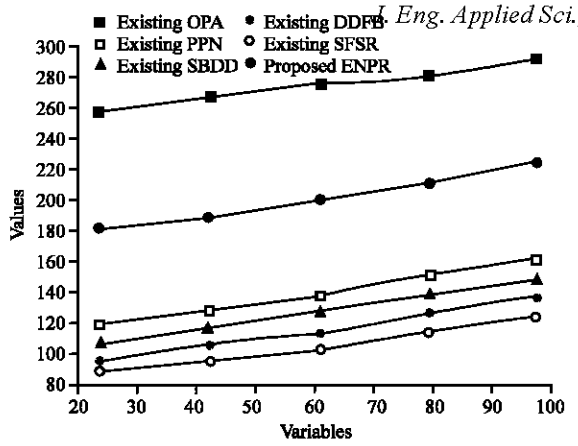

Fig. 7: Graph for nodes vs. energy consumption

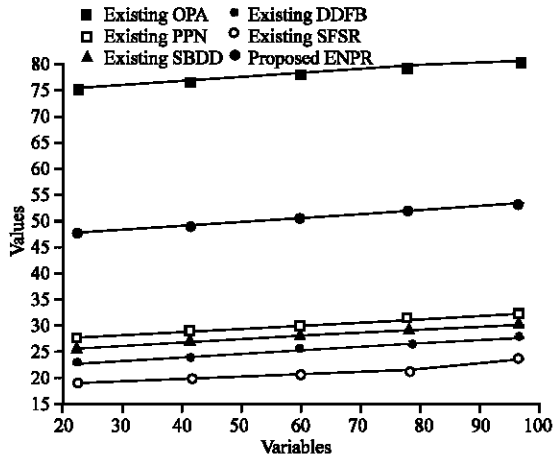

Fig. 8: Graph for pause nodes vs. packet loss rate

$$\text{Packet loss rate} = \left(\text{Number of packet}\frac{\text{Lossed}}{\text{Sent}}\right)*100$$

CONCLUSION

MANET nodes are always ready to communicate with each other nodes which one is present and link established that are selected to perform packet transmission. In that communication packets are some situation misrouted makes lot of resource is wasted, to perform packet broadcast, data overload is occurred to reach destination node. Present ENPR method provides the better routing path from sender node to destination node, the misroute of packet is identified by use of location pursuing algorithm, it detects the misroute node and collect the data packet also upload to correct route node in routing path. Pursue node is introduced that node perform those process. It improves detection efficiency x and packet delivery ratio also minimizes average delay, network overhead and energy consumption.

RECOMMENDATION

In future work focus multi stream data transmission to analyze energy consumption.

REFERENCES

Aalo, V.A., G.P. Efthymoglou, T. Soithong, M. Alwakeel and S. Alwakeel, 2014a. Performance analysis of multi-hop amplify and forward relaying systems in Rayleigh fading channels with a Poisson interference field. IEEE. Trans. Wirel. Commun., 13: 24-35.

Aalo, V.A., K.P. Peppas, G.P., Efthymoglou, M.M. Alwakeel and S.S. Alwakeel, 2014b. Serial amplify and forward relay transmission systems in Nakagami-S m S fading channels with a Poisson interference field. IEEE. Trans. Veh. Technol., 63: 2183-2196.

Abbas, S., M. Merabti, J.D. Llewellyn and K. Kifayat, 2013. Lightweight sybil attack detection in MANETs. IEEE. Syst. J., 7: 236-248.

Bagayoko, A.B., R. Dhaou and B. Paillassa, 2016. Analytical analysis of fault management in MANETs. Proceedings of the 2016 International Conference on Wireless Communications and Mobile Computing (IWCMC'16), September 5-9, 2016, IEEE, Paphos, Cyprus, ISBN:978-1-5090-0305-1, pp: 1092-1099.

Beaulieu, N.C. and S.S. Soliman, 2012. Exact analysis of multihop amplify-and-forward relaying systems over general fading links. IEEE. Trans. Commun., 60: 2123-2134.

Cheng, Z. and W.B. Heinzelman, 2004. Exploring Long Lifetime Routing (LLR) in ad hoc networks. Proceedings of the 7th ACM International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems, October 04-06, 2004, ACM, Venice, Italy, ISBN:1-58113-953-5, pp: 203-210.

Egbogah, E.E., A.O. Fapojuwo and L. Shi, 2012. An energy-efficient transmission scheme for monitoring of combat soldier health in tactical mobile ad hoc networks. Proceedings of the 2012 Conference on Military Communications (MILCOM'12), October 29-November 1, 2012, IEEE, Orlando, Florida, ISBN:978-1-4673-1729-0, pp: 1-7.

Gambhir, S. and S. Sharma, 2013. PPN: Prime product number based malicious node detection scheme for MANETs. Proceedings of the 2013 IEEE 3rd International Conference on Advance Computing (IACC'13), February 22-23, 2013, IEEE, Ghaziabad, India, ISBN:978-1-4673-4527-9, pp: 335-340.

Hu, D., P. Fan, N.C. Beaulieu and P. Fan, 2016. Outage probability analysis of linear MANETs in dual-hop AF systems with noisy relay and interference-limited destination. IEEE. Trans. Veh. Technol., 65: 1795-1800.

Lee, H.C., S.M. Cheng, K.P. Wu and H.M. Lee, 2016. A responsive probing approach to detect dynamic intrusion in a MANET. Proceedings of the 7th International Conference on Information, Intelligence, Systems and Applications (IISA'16), July 13-15, 2016, IEEE, Chalkidiki, Greece, ISBN:978-1-5090-3430-7, pp: 1-6.

Maleki, H., M. Kargahi and S. Jabbehdari, 2014. RTLB-DSR: A load-balancing DSR based QoS routing protocol in MANETs. Proceedings of the 4th International eConference on Computer and Knowledge Engineering (ICCKE'14), October 29-30, 2014, IEEE, Mashhad, Iran, ISBN:978-1-4799-5487-2, pp: 728-735.

Mandhare, A.P. and S.V. Kadam, 2016. E-TWRP: Establishing trust worthy reliable path in Mobile ad hoc network. Proceedings of the International Conference on Emerging Technological Trends (ICETT'16), October 21-22, 2016, IEEE, Kollam, India, ISBN:978-1-5090-3752-0, pp: 1-5.

Palma, D. and M. Curado, 2013. Scalable multi-hop routing in wireless networks. EURASIP. J. Wirel. Commun. Netw., 2013: 86-86.

Pongaliur, K. and L. Xiao, 2014. Multi-fusion based distributed spectrum sensing against data falsification attacks and byzantine failures in CR-MANET. Proceedings of the 2014 IEEE 22nd International Symposium on Modelling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS'14), September 9-11, 2014, IEEE, Paris, France, ISBN:978-1-4799-5610-4, pp: 443-452.

Remya, S. and K.S. Lakshmi, 2015. SHARP: Secured hierarchical anonymous routing protocol for MANETs. Proceedings of the 2015 International Conference on Computer Communication and Informatics (ICCCI'15), January 8-10, 2015, IEEE, Coimbatore, India, ISBN: 978-1-4799-6804-6, pp: 1-6.

Renzo, M.D. and W. Lu, 2015a. End-to-end error probability and diversity analysis of AF-based dual-hop cooperative relaying in a Poisson field of interferers at the destination. IEEE. Trans. Wirel. Commun., 14: 15-32.

Renzo, M.D. and W. Lu, 2015b. On the diversity order of selection combining dual-branch dual-hop AF relaying in a Poisson field of interferers at the destination. IEEE. Trans. Veh. Technol., 64: 1620-1628.

Salhab, A.M., F. Al-Qahtani, S.A. Zummo and H. Alnuweiri, 2013. Fixed-gain AF relaying with interference-limited destination in Rician-Nakagami-m fading channels. Proceedings of the 2013 IEEE Conference on Wireless Communications and Networking (WCNC'13), April 7-10, 2013, IEEE, Shanghai, China, ISBN:978-1-4673-5938-2, pp: 2683-2688.

Win, M.Z., P.C. Pinto and L.A. Shepp, 2009. A mathematical theory of network interference and its applications. Proc. IEEE., 97: 205-230.

Zhong, C., S. Jin and K.K. Wong, 2010. Dual-hop systems with noisy relay and interference-limited destination. IEEE. Trans. Commun., 58: 764-768.