

Analysis of Different Routing related Energy Optimization Methodologies in WSNs

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ABSTRACT

For personal, mobiles and sensor communications wireless sensor networking is an emerging concept in recent years. Normally wireless sensor network (WSN) is combined and integrated data relations for modern communication in infrastructure, energy efficiency; these are the main design parameters to improve network performance with respect to mitigate communication relations. In this paper, we describe different type's energy optimization techniques/approaches and basic routing scenarios used for efficient communication in wireless sensor networks. To support data communication in wireless sensor networks we also give brief description about different routing protocols. And also define different routing algorithms used in data communication to increase network efficiency with respect to different network parameters. In this survey, we discuss about energy optimization approaches in wireless sensor networks, and also define several techniques which aim energy consumption in wireless nodes in WSNs.

Keywords : Wireless communication, routing algorithms, routing protocol hierarchy, energy aware routing, wireless sensor networks and energy optimization.

I. INTRODUCTION

Among the different access organizing innovations, remote systems administration has developed as a financially savvy elective to different conventional wireless network approaches, e.g., Line for Digital Subscribers (DSL) and Modem Cable (CM). Being a related wireless medium, utilizing a remote system, wiring need not achieve the distance to the end clients; in this manner, wireless networks saves network maintenance cost with respect to client requirements. Local area wireless networks (WLAN) can work in network maintenance and self assisted mode. Wireless ad hoc networks, in which a decentralized system is where every hub (end-client hub) can forward information bundles for different hubs. The fundamental goal of an Ad-Hoc network is to keep up the hub's availability and dependably

transport the information parcels. Furthermore, every hub progressively decides its next packet in view of the system topology [1-5]. One kind of Ad-Hoc arranges is the wireless sensor networks (WSNs) is a self-designing system of portable hubs (additionally called switches), can arrange frame by frame in dynamic topology. Routers could move and arrange frames in same pattern; along these lines, the topology of the remote system may change quickly and capriciously. Such a system may work in an independent form, or might be associated with whatever is left of the Internet.

Wireless Sensors Networks (WSNs) is a combination of smaller than expected detecting gadgets, disseminated over an extensive zone for watching changes in the earth. The gadgets speak with each other in an on request through conventions that are

particularly intended for independent correspondence. Sensors are constructed utilizing miniaturized scale electro mechanical frameworks which has prompted create restricted assets hubs. WSN discovers its application in differed fields like observation, natural surroundings and mechanical checking, wellbeing sciences, and so forth. Detecting gadgets frame the essential operational unit of the system that is self battery controlled with restricted life time. Sensor gadgets use energy for transmission, gathering, directing and detecting data that is imparted to neighbors or a typical base station. Visit energy usage prompts arrange correspondence corruption because of drop outs, dead hubs or connection disappointments and restricted energy proficient courses and arrange lifetime hindering [1, 2]. The principal approach is done utilizing compelling directing strategies that depends on energy limitation of the gadgets. Energy compelled routing is considered to deal with energy usage of the gadgets through ideal basic leadership process [3]. Numerous algorithms have been proposed to regularize energy use that eventually goes for drawing out system lifetime.

In this paper, we discuss about basic techniques/approaches/algorithms used for efficient communication in wireless networks. We survey of different energy optimization methods via link failure/recovery approaches. Load balancing with distance constraints based energy optimization techniques.

II. REVIEW OF LITERATURE

This section describes the evaluation of different authors energy-oriented route-based data transmission in wireless sensor networks.

Fengxiao Tang, Bomin Mao et al. in [2] gives an examination on present day WSNs. They initially talk about some fundamental wordings utilized in WSNs

and after that investigate different detecting assignments. Next they examine different uses of WSNs. They moreover specify different variables that affect the general outline of a sensor hub. They likewise examine the correspondence engineering of WSNs alongside different algorithms and conventions that encourage te working of WSNs. At long last they examine come look into challenges in acknowledgment of WSNs. In Yongjun Sun et.al [3] ZHANGBING ZHOU1 et al. gave a study of different clustering algorithms that are particularly intended for WSNs. They examined about different intermingling time algorithms where combination time is the time required prior to every one of the switches/group heads achieve an assertion about the topology of the WSN. They arranged clustering algorithms in two class's variable assembly time algorithms, consistent assembly time algorithms. Variable assembly time algorithms are valuable when number of hubs in WSN is low while steady intermingling time algorithms are helpful when number of hubs in WSNs is high.

A point by point execution assessment of information accumulation in clustering based WSNs is given by Muhammad Asghar Khan et al. in [4]. They have clustered sensor hubs in view of their entropy. Initially, hubs detecting comparative sort of information are set in unmistakable clusters. In the most pessimistic scenario if no more cluster can be shaped, at that point dissimilarity of a hub is ascertained as for each cluster then hubs are set in slightest disparate clusters. In conclusion they assessed execution of their plan in view of different parameters like intermingling rates, normal parcel drop, transmission cost and so forth utilizing NS2 test system. Their outcome exhibit that their proposed conspire outflanks different current energy preservation plans of WSNs. Rahat Ali Khan1• Khalid Hussain et al. [5], proposed one more plan for grouping in WSNs utilizing honey bee state algorithm. In honey bee settlement algorithm, we

endeavor to mimic the conduct of nectar honey bee swarms. The scientists have proposed new algorithms called ICWAQ to make group and select cluster heads. Their proposed ICWAQ algorithm not just delays WSN lifetime yet additionally enhances quality of service (QoS) of the WSN. Their test results demonstrate that ICWAQ works respectably as for different algorithms. A fuzzy rationale based clustering strategy is proposed by Murat Dener et al. in [6]. They have expanded fuzzy rationale in LEACH algorithm for WSNs. In their procedure called LEACH-ERE, the cluster head is chosen utilizing a fuzzy approach which centers around expected remaining energy which is the lingering energy left in a sensor hub in the event that it will be chosen as cluster head and finish its round. Accordingly the overhead of turning into the group head is more suitably conveyed among the different hubs in a group. Their reenactment results demonstrate that the proposed plot is more proficient than a large portion of other appropriated algorithms for WSNs including LEACH and CHEF.

In Naeem Ayoub [†], Muhammad Asad et.al [7], the scientists have proposed yet another fuzzy based plan for group head determination. Be that as it may, not at all like different plans, the determination of cluster heads will be done in the base station. The fuzzy sources of info picked by them are energy level of sensor hubs and physical separation to base station. Their trial result demonstrate that their proposed conspire can decrease energy utilization in First Node Dies (FND) round and in addition it has moreover expanded the throughput of the base station before FND.

In B. Mao et al [11], looks into have given us an expansive study of different energy preservation methods display in WSNs. They have given scientific categorization of customary energy productivity strategies and the work in progress energy proficiency systems of WSNs. And no more key level, there are three energy protection strategies obligation

cycling, information driven methodologies and portability based methodologies. In M.Erdelj, E.Natalizio, K.R et.al. [13-14] obligation cycling strategy, a hub goes into off-state or rest state at whatever point a correspondence isn't required. Since correspondence is required infrequently so putting a hub in rest state spares heaps of energy. In information driven methodologies, the significant center is the way the information is detected which additionally extensively impacts the energy utilization of WSN. There are clusters of tests detected which are not in the slightest degree required. Likewise superfluous algorithm in the power obliged WSN hub too impacts its battery life [18-22]. Portability construct approaches center with respect to the versatility of WSN hubs. In the event that a sensor hub is portable at that point it center around how to gather its information, how it will transfer the message, how it will affect the general system and so on.

III. ROUTING TECHNIQUES

This section describes the analysis of different routing algorithms performance in wireless sensor network communication in real time scenario for efficient data transmission. We discuss some of the routing approaches with their descriptions in real time data transmission over wireless networks.

a) **Efficient Routing related algorithm to explore bandwidth & Clock related packet rate**

This algorithm instills the utilization of dynamic – separation vector directing conventions, for example, RIP, RIPV2, IGRP, and EIGRP to decide the way. These types of routing conventions will decide the best way by breaking down just the packet tally. For example, in the event that a parcel experiences a switch it alludes to one packet. So minimal number of jump checks will be constantly considered as best

way. In such case, those conventions will decide just the most limited way, consist the best root. The explanation depends on its obliviousness of transfer (transmission of data) and clock rate (bits/sec) of the way where the information needs to travel, subsequently time consuming in routing and re-directing happens. Standard Access Control List (Firewall of the switch) which describes apposite consumption a whole correspondence between source and associated node in network. Here LSR PROTOCOL for example OSPF, to decide the way is actualized. An OSPF routing convention will decide the best way, particularly by breaking down the data transmission and clock rate. It doesn't consider about minimum of packet equalized. It will consistently pick just the way which is having most elevated data transmission among different ways and furthermore to expand the time for both routing and re-routing in transmission rate. VLSM and DHCP on our systems, which is describes lessen the time consuming and overlook the idle has on the system to decrease the investigating time is applied into data transmission. Another ACL (Firewall of the Router) which is Extended Access Control List (EACL) is created. With the assistance of the new EACL Configuration we can deny or permit the correspondence on convention premise which implies on the off chance that we require just HTTP network related communication, we can prevent the rest from securing the administrations like NFS, FTP, TELNET, SNMP, and so forth. With the goal that the clients from the goal system can access the HTTP site, the clients promptly denied the event that they attempt to get to any of our different administrations (NFS, FTP, TELNET, and SNMP). Hence use of data transfer capacity is effective in the strategy.

b) Survey of Different architectures, Routing scenarios in Flying related Ad hoc Networks

Because of increasing advance communication system between sensors, wireless nodes present in associated framework with respect to UAVs (Unmanned Air

Vehicles) which are used for few business, military related client related citizen application. At the same time, main communication behind energy in UAV is insufficient then numerous related routing descriptions are analyzed in flying related ad hoc networks, this types networks gathering information in selected path which is not incorporated into significant level of communication. Control of packets in FANETs, which are self-organizing with selected routing path between controlling related UAV nodes primarily select data transmission within region in wireless ad hoc networks communication. Basic representation of UAV based routing scenario with respect to data transmission over wireless networks described in figure 1.

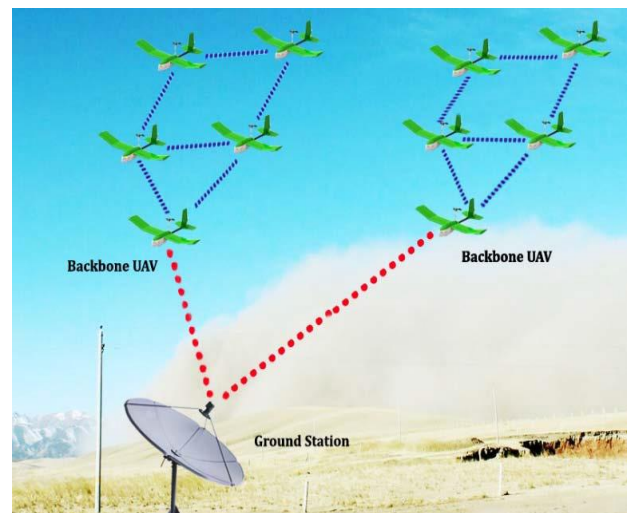


Figure 1. Multi user communication in wireless ad hoc networks.

On one hand, if there should be an occurrence of cataclysmic circumstances when standard correspondence framework isn't accessible, FANETs can be utilized to give a quickly deployable, adaptable, self-organizing and moderately related little working costs organize; the other hand associating various UAVs in specially appointed system is a major test. This degree of coordination requires a proper correspondence design and routing conventions can be set on exceptionally dynamic flying hubs so as to build up a solid and vigorous correspondence.

c) Ant Colony Optimization Based Improved Routing Scenario in Wireless Sensor Networks

In this section, describe the energy compelled and routing related scenario in wireless sensor networks (WSNs) describes key type of routing. Based on the unique way of data transmission in wireless sensor networks, another different routing scenario mainly depends on link state related algorithms. Using some heuristic related node by node routing scenarios in transmission of data which describes the how energy it being utilized in network to increase the lifetime of network. Experimental related results explains insect related routing with separation of energy at each node in network with increasing of life time in terms of data transmission and other related parameters. Improving routing scenario described in figure 2

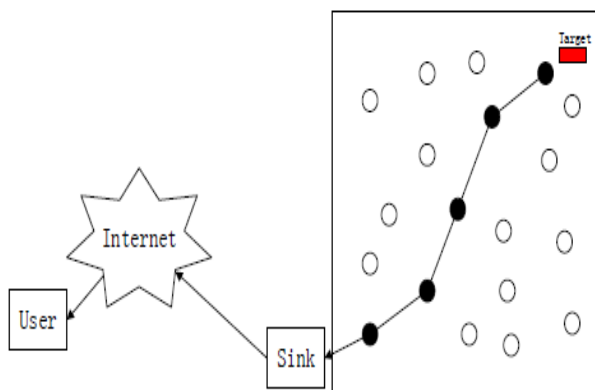


Figure 2. Improved routing communication procedure in wireless sensor networks.

By improving the heuristic capacity what's more, giving by and large thought to transmission separation of hub correspondence, transmission course, lingering energy what's more, good ways from the Sink hub, another course refreshing principle is presented, which prompts a generally high normal lingering energy level and a high negligible estimation of the leftover energy.

d) On Removing Routing Protocol from Future Wireless Networks: A Real-time Deep Learning Approach for Intelligent Traffic Control

Presently, learning with respect to deep communication has showed up as a leap forward AI strategy for different territories in software engineering just as different orders. In any case, the use of in-depth learning in terms of communication for organizes data transmission control in wireless sensor networks is a moderately new zone. With the development of remote systems, productive system traffic control, for example, routing strategy in the remote spine organize shows up as a key test. This is on the grounds that the traditional routing conventions don't gain from their past encounters with respect to organize irregularities such as clog, etc. Hence, a canny system traffic control strategy is fundamental to stay away from this problem. Propose another, constant deep learning based shrewd system traffic control technique, misusing deep Convolution Neural Networks (deep CNNs) with interestingly described information sources and yields to speak to the thought about Wireless Work Network (WMN) spine. Reenactment results exhibit that our proposition accomplishes altogether lower normal postponement and parcel misfortune rate contrasted with those saw with the current routing techniques. Deep learning procedure described in figure 3.

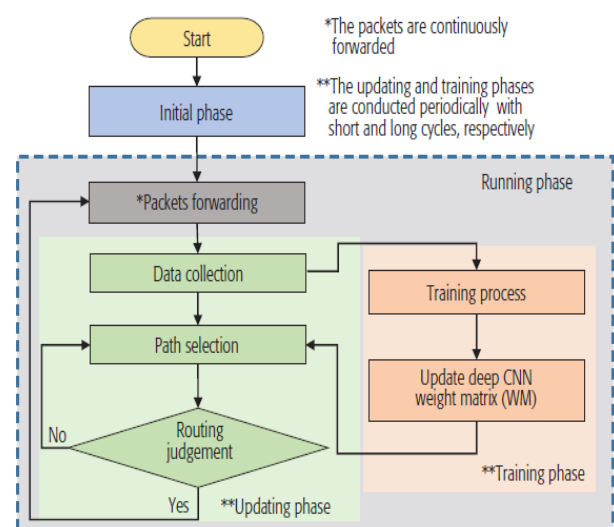


Figure 3. Representation of network traffic flow using deep learning procedure.

Especially center around our proposed technique's autonomy from traditional routing scenarios, which

consists exponential routing protocol hierarchy in future related wireless sensor networks. We assessed the presentation of our proposition utilizing broad PC based reproductions. The reproduction results showed that our proposition accomplishes significantly lower normal deferral and parcel misfortune rates interestingly with the customary routing strategies. It is significant that in this article, we just considered the continuous difference in loads of the deep CNN to complete internet learning. Nonetheless, later on, contingent upon the experienced traffic attributes with random communication of data transmission, let us consider progressively altering the in-depth learning in CNN describes efficient communication. All things considered, because of our proposition's freedom from existing directing conventions, it is a reasonable possibility to develop past the best in class routing worldview.

e) The Design and Implementation of the XWCETT Routing Algorithm in Cognitive Radio Based Wireless Mesh Networks

The Wireless Mesh Networks (WMNs) innovation has as of late risen as a promising rapid remote innovation, which gives internet access with respect to incorporated remote correspondence arrangements. Incorporating the customary remote with new remote advancements, for example, cognitive radio (CR) innovation makes a stage for rapid broadband correspondence. With respect to multi-packet data transmission in cognitive radio network, exhibition on network routing system with respect to client emulation in wireless ad hoc network systems. Clients describes the routing based on performance of cognitive radio networks, traditionally routing scenarios describes stream related routing with respect to power consumption values in wireless sensor networks with respect to pre-requisites in cognitive radio network communication.

The structure and the design of CR innovation increment the radio frequency (RF) range use by

permitting unlicensed clients to detect and craftily get to authorized range groups. Be that as it may, the authorized primary user (PU) (PU) ought to be shielded from impedance. Subsequently, adjusting WMNs to utilize the CR innovation is probably going to improve significant the exhibition gain as far as effective usage of the range and system limit. In a multi hop organize condition, correspondence relies upon the dependability of the system network. Then again, solid and hearty network relies upon the productivity and adequacy of a directing procedure utilized. Subsequently, both the work switches and customer hubs assume a central job in communication in choice making. As an outcome, the execution and enhancement of productive routing convention stay a huge part in the CR-WMN. This study featured various directing issues and difficulties experienced in the CR-based multi-hop networks. The normal test supporting the insufficient presentation of CR-based multi-hop systems is the need to powerfully share the spectrum and reconfigures the system parameters.

IV. ENERGY OPTIMIZATION TECHNIQUES

This section describes energy optimization approaches/methodologies based on efficient routing scenario in wireless network communication. We discuss about some of the techniques and their performance evaluation in communication over wireless sensor networks.

a) Energy-Efficient Routing Protocols for Solving Energy Hole Problem In Wireless Sensor Networks

Presently, different authors presented energy proficient dynamic routing conventions for remote sensor systems to maintain a strategic distance from the untimely finish of system lifetime. This methodology tends to the directing opening issue because of energy exhaustion and the exchange off

between the system requirement for occasional arrangements to save availability and power limitations on sensor hubs. This approach takes care of the issue of the untimely finish of network life time with respect to BS is a long way from the Region of Interest (ROI). These conventions are On-Hole Children Reconnection (OHCR) with neighborhood nature and On-Hole Alert (OHA) with worldwide nature. The energy routing protocol describes safeguard the network of all the communications arrangement stage, single way connects with any topology in a energy productive way by maintaining a strategic distance from topology reconstruction overhead.

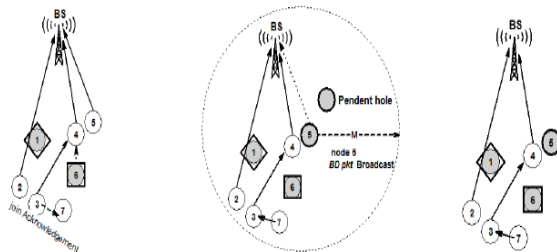


Figure 4. OHA parent, client node communication in wireless networks.

The reproduction results demonstrated that the proposed conventions beat the ongoing ones regarding system lifetime, hub misfortune rate, and system overhead. With the end goal that, the two conventions are analyzed on both Degree Constrained Tree (DCT) and Shortest Path Tree (SPT) to give about half to 75% expansion in arrange lifetime over the ongoing energy effective directing conventions; like UCCGRA and NEECP. Furthermore, applying OHCR and OHA to any system topology doesn't influence its soundness period, since these conventions are activated by routing opening event. The worldwide idea of OHA convention adds recognizable energy overhead because of the topology re-setup process in the event of root gaps. Be that as it may, OHA gives extremely high versatility by re-transmit the topology transmission in re-transmit algorithm which is indicated by application necessities. Utilizing OHCR

or OHA, the life time of network to be increased at first stage tree can be reached out around 5 to multiple times, individually. On account of the energy productivity in topology related to proposed calculations ensure arrange soundness about 25% and above percentage focused on power consumptions in proficient conventions NEECP and UCCGRA, individually. Also, the proposed conventions limited the system overhead to be under 10% of the power consumed by NEECP and UCCGRA at the point when the BS is outside the ROI at various positions. So also, OHA demonstrated preferred outcomes over NEECP and UCCGRA, particularly as far as hub misfortune rate. Toward the finish of this work, we are anticipating concentrating the booking issue of the executed directing conventions to discover the results to increase lifetime of the network and timetable length, concentrating other disengagement reasons; for example physical harm, and contemplating the conduct of the different heterogeneous related networks.

b) An Energy Efficient Routing Protocol for Wireless Body Area Sensor Networks

This section describes about efficient and reliable data transmission with respect to energy utilization in reliable data transmission proposed in wireless ad hoc related sensor networks. In this scenario of sending or receiving data from different sensor eight sensors are used to hub communication and one sensor is for recording data. These two related sensors are separated by multi-packet data transmission level over routing establishment at each sink. Each sensor processed data to forwarding hub with respect to accumulative data transmission and data forwarder to connection link from each sensor. Two parameters are basically used to choose best path to sent data via sensor with extreme energy communication over developed associated data information in separate energy utilization in wireless ad hoc networks.

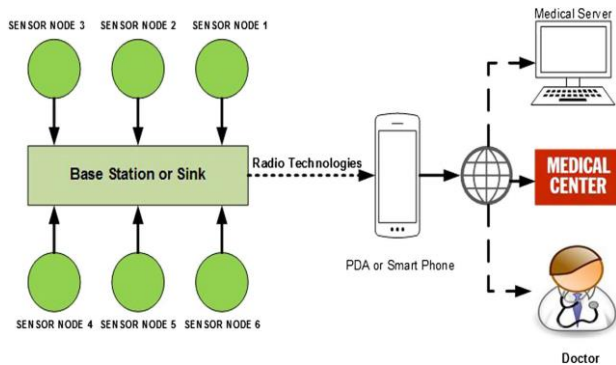


Figure 5. Wireless network communications with respect to different sensor nodes

An energy proficient routing convention for wireless sensor networks is proposed to accumulate efficient communication. Implementation of data transmission over multi node communication describes ordinary multi-oriented packet transmission in multi-task packet transmission. In this scenario, first sensor activated and process data into forwarder data. Forwarder hub sends data to all the remaining sensors with respect to advancement of data transmission over sensor sink. At each iteration calculate energy consumption over forwarded node with good communication over less energy consumption in wireless sensor networks. The proposed plan accomplished better network lifetime with respect to data transmission over sensor hubs kick the bucket gradually making it a productive routing convention.

c) A New Energy Efficient Hierarchical Routing Protocol for Wireless Sensor Networks

Wireless sensor networks comprise of ease sensor related hubs which can be constrained energy consumption, limit in memory consumption, preparing ability and data transmission. Sensor related hubs assemble data from novel earth communication over send data from gathered information with assistance of routing participation over all the nodes. Because of different constraints present in WSNs, different types of activities may raise different issues; some types of routing issues

define different tasks data communication in ad hoc networks. Most significant way behind data transmission is productivity of energy. Wireless sensor networks are broadly used to explore energy efficiency of implementation over Internet of Things in wireless sensor networks. Some innovative researchers have been proposed a few various leveled steering conventions, for example, LEACH (Low Energy Adaptive Clustering Hierarchy), PEGASIS (Power-Efficient Gathering in Sensor Information Systems), TEEN (Threshold-sensitive Energy Efficient Sensor Network Protocol) and APTEEN (Adaptive Periodic Threshold-sensitive Energy Efficient Sensor Network Protocol). In this examination, an energy productive steering convention is created which is more proficient than right now available directing conventions. The created convention includes mapping of the system, rest wake/load adjusting, and information blend forms. The proposed convention gives preferred outcomes over different conventions in number of enduring hubs and measure of energy devoured criteria's. Data transmission based on cluster head selection described in figure 6.

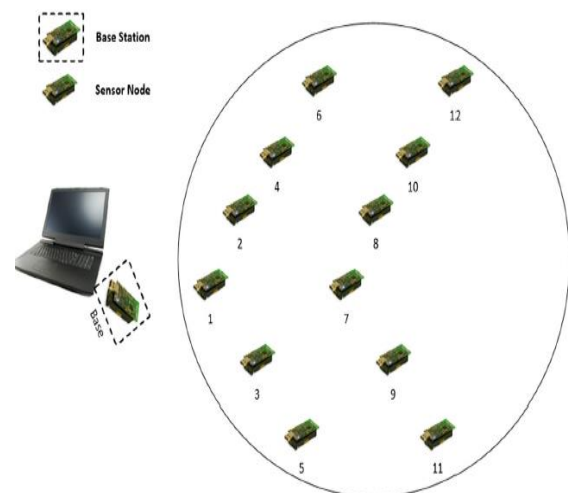


Figure 6. Sample description of LEACH based data transmission in WSN

Another various leveled directing convention for remote sensor systems was created. Based on user perceptiveness in terms of sensor networks describes nodes communication, memory maintenance with

respect to energy utilization creates in data transmission. Data streaming present in network system describes efficient energy utilization from base station to all the nodes in wireless sensor network communication. Experimental evaluation of this approach performs execution time for node simulation, packet delivery ratio, power consumption in nodes communication over quality and quantity communication in ad hoc related wireless sensor networks.

d) An Intelligent Secured and Energy Efficient Routing Algorithm for MANETs

Data transmission and security over node communication between sensor nodes in wireless sensor networks, application level based data utilization, firewall detection and interrupt connection over node location in sensor networks. Additionally, it is frequently important to convey mystery data in military applications where pressing and solid correspondence is increasingly significant. If majority of attacker related nodes are high in terms of data transmission between sensor node communication, node validity and security, are the significant parameters for associated communication

over nodes in wireless sensor networks, it is the basic issue to describe security between different nodes with routing algorithms. Different types of security related attacks may appear in routing scenario over streaming data with respect to energy utilization.

Cluster based Energy Efficient Secure Routing Algorithm (CEESRA) is proposed to verify routing communication with respect to security and other parameters described to explore streaming related data transmission based on trust score to identify successful nodes communication. This routing related streaming describes Denial of Service attacks with respects to users communication, proposed streaming related algorithmic simulated results show efficient routing delay, data transmission and secure communication results in wireless sensor related ad hoc networks.

V. COMPARISON OF DIFFERENT APPROACHES

This section describes the Comparison of different routing, energy related methodologies/protocols implemented in wireless ad hoc/sensor networks. Comparison of algorithms described in table 1.

Table 1. Comparison of different routing/energy related methodologies in wireless networks

Author Names	Used Technique	Description	Advantages	Disadvantages
Ogundile, O et.al [21]	energy-efficient and energy-balanced routing protocol	To reduce energy consumption based schedule of sensors in semantic order.	Based on data integrity with respect to link-state routing under promising whole data communication between nodes.	Not support for heterogeneous sensor networks
L. M. Kola et.al [8]	Implementation of the XWCETT Routing	Change the sensor node power consumption between probabilities in active communication	reduced packet delivery ratio, delay	Not focus on capacity of a node
Rahat Ali Khan1 et.al	Hierarchical Clustering-based Energy Efficient Routing Protocol	Trigger related node communication appears GRBP time consumptions between	Clustering related approaches mitigates communication over	Prolonging the network lifetime.

[5]		nodes	different nodes in wireless sensor networks	
M. I. Chidean et.al [20]	Energy based cluster related communication protocol hierarchy	Describe vehicle/node-to-vehicle/node communication with respect to co-operative data flow in wireless sensor networks.	To reduce the loop holes of prevailing clustering protocols	Loss of maintain energy variance, load balancing between nodes
B. Mao et al et.al [11]	A new emerging energy harvesting technology based on Deep Learning	Energy consumption reduction routing strategies in WSN	Efficient transmission Distance, avoid congestion	Relatively poor network lifetime, transmission delay
Li J , Liu et.al [17]	Energy harvesting with respect to DPSO based cluster hierarchy	Electrical related energy communication over node movement	No limit over energy	High amount of energy utilization
Yongjun Sun et.al [3]	Ant Colony Optimization based An Improved Routing Algorithm	Particle swarm optimization based data transmission over energy at each node with PSO methodology	Energy Consumption	Loss of network delay
Murat Dener et.al [6]	A New Energy Efficient Hierarchical Routing Protocol	Handles redundant based data communication to process network architectural data transmission in WSNs	Increases the lifetime of the WSN	Redundancy of nodes in formation of cluster

VI. SCOPE OF THE RESEARCH

Because of wireless data transmission over wireless medium, individual node data transmission over multiple clients in wireless sensor networks, routing, re-routing related characteristics are accumulated in enhanced significant transmission, main idea behind multi routing is location based data transmission via different route communications mainly focused on opportunistic routing in ad hoc networks. Link state related protocols are proposed to explore multi-task related data transmission over sensor networks. Energy utilization is also main factor in multi-cast routing in sensor networks. Packet forwarding related node communication is also major factor in sensor network communication, so that energy utilization with respect to efficient data transmission over reduction of different types attacks in wireless sensor network is still a major task, in our research, we concentrate on energy utilization, memory utilization, packet delivery ratio and other network related parameters with respect to multi-cast routing

in sensor networks. Hence, our research mainly focused on the requirement to build up a routing strategy by reducing energy consumption to preserve the network connectivity and capacity in wireless sensor networks.

VII. CONCLUSION

In wireless communications, routing is attracted lot of communication in past decade years and represents unique data communication and routing challenging in ad hoc networks. In this paper, we summarize recent protocols or routing algorithms used in data communication and classified approaches briefly. We describe related work relates to define different authors opinion regarding routing concerns in wireless sensor communication. We also describe about different energy concerns relates to implementation of network efficiency for data communication in ad hoc related sensor networks.

Further improvement of our research, we implement different advanced routing with respect to security aware routing to describe network efficiency and other simulation parameters for wireless sensor networks.

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