A Review on Wireless Sensor Network Routing Algorithm using Bio-inspired Computing

D. Antony Arul Raj[1], V. Keerthana[2], R. Roshini[3]

[1]Assistant Professor, Dept. IT & CT, VLB Janakiammal College of Arts and Science, Coimbatore, India

[2,3]Student- Department of IT & CT, VLB Janakiammal College Of Arts And Science, Coimbatore, India

Abstrac: Wireless sensor network is dynamic and distributed node which controls the transmission range, processing as similar as limited energy source. The information that enables them to select routes between any two nodes on a computer network is referred as routing protocol. Wireless sensor networks (WSN), is also called wireless sensor and actuator networks (WSAN), some of the modern networks are bi-directional, and sensor activity are used to control them. The WSN is built of "nodes" – each and every node is connected with the sensors they have connected radio receiver with external and internal antennas.

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I. INTRODUCTION

- **WHAT IS WIRELESS SENSOR NETWORK**

An wireless sensor network (WSN) is a distributed autonomous sensors that are used to moniter the environmental conditions these things are motivated by the military applications.

- **ROUTING**

A routing protocol says that how the routers communicate with each other and how routers forms the route between two nodes on computer networks

- **What is Optimization?**

Optimization is a term that covers all sectors of human life and work; from scheduling of airline routes to business and finance, and from wireless routing to engineering design.

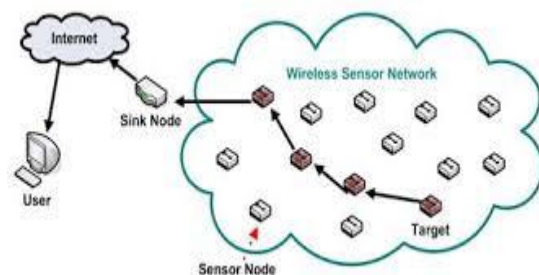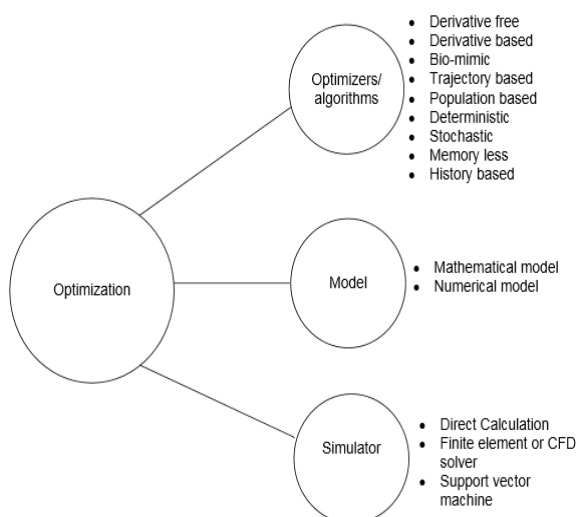Figure 1. A simple optimization process.

Fig. 2 Overview of WSN

II. LITERATURE REVIEW

Md. Akhtaruzzaman Adnan[1], et al., authors have focused their investigations on wireless sensor networks. Some issues related to wireless sensor networks are energy minimization (optimization), routing protocols, etc., have been extensively explored. Energy efficiency, quality of service and security management are the major issues. Optimization is necessary to get the best outcome for these issues. Now the existing researches is based on bio-mimetic strategy-based optimization techniques of wireless sensor networks. These techniques are diverse and involve many different optimization algorithms.] In this paper they took a step in that way of presenting a survey of the literature in the vicinity of wireless sensor network optimization. Particle swarm optimization, ant colony optimization and genetic Sensors 2014, 14 300 algorithm are most widely used bio-mimetic algorithms. In addition, to encourage new research and development interests in this field, challenges and future research instructions are highlighted.

Marwa Sharawi[2], et al., has projected that WSNs are defined as dynamic, self-deployed, highly guarded structured network. It`s high computational environment. It controls transmission range, processing, as like limited energy sources. T he active nodes and network lifetime was affected by power constraints.By overcoming the scarcity in energy resource(SER) the life time of the

network will be prolonged. The sensor nodes energy will be reduced by approaching power management (PM). The adaptive efficient routing technique has greatly appeals a great knowledge in research area. It highly addresses their adaptability and compatibility to overcome the complex challenges in WSNs. This paper is introducing and surveying some of the inspired Computing proposed. routing models for WSNs that optimally prolongs its life time.

Akyildiz .W [3] sovereign that the Wireless sensor networks (WSNs) are networks of distributed nodes that can sense their environment cooperatively.Most of the applications in wireless sensor networks (WSNs) require location in sequence of the randomly deployed nodes. A few special beacon nodes having location awareness, which help the ordinary nodes to localize it. In this approach ,the noisy distance measured from three or more non-collinear beacons are estimated by non-beacon nodes. An investigation on distributed iterative localization is presented here. The localized nodes in an iteration act as references for remaining nodes to localize. Using particle swarm optimization (PSO) and bacterial foraging algorithm (BFA) the problem will be addressed. the number of nodes localized, localization accuracy and computation time are the comparison between PSO AND BFA. In this paper, the ranging-based localization task is formulated as a multidimensional optimization problem, and addressed by using bio-inspired algorithms, exploiting their quick convergence to quality solutions.

Elizabeth M. Royer, Chai-Keong Toh,[4]- proposed that the mobility of networks causes the routing protocols meant for wired networks cannot be used for mobile ad hoc networks . The ad hoc routing protocols can be divided into two classes:- table-driven and on-demand. Here it discusses about the routing protocols belonging to each category. Networks is an rising new technology that will allow users to access information and services electronically, regardless of their geographic position. Wireless networks can be classified in two types:- infrastructured network and infrastructureless (ad hoc) networks. Infrastructured network with fixed and wired gateways. A host communicates with a bridge in the network (called base station) within its communication radius. The unit can move geographically while it is communicating. When it goes out of range of one base station, it connects with new base station and starts communicating through it. This is called handoff. In this approach the base stations are fixed Ad hoc networks are very useful in emergency search-and-save operations, meetings or conventions in which persons wish to quickly share information, and data acquirement operations in inhospitable environment

Yi shang ,ed al [5]- recently, researched that wireless sensor networks are garnering a lot of interests, as it is feasible to deploy them in many ad hoc scenarios such as for earthquake monitoring, tsunami monitoring and battlefield surveillance.. Clustering is an approach actively pursued by many groups in realizing more scalable data gathering and routing.. They proposed a novel application of collective social agents to guide the formation of these clusters.. An analysis is performed to determine the optimal number of clusters necessary to achieve the highest energy efficiency. In order to allow for a realistic evaluation, a comprehensive simulator involving critical components of the communication stack is used. Our protocol is found to ensure a good distribution of cluster heads through a totally distributed approach. To quantify certain clustering properties, we also introduced two fitness metrics that could be used to benchmark different clustering algorithms.

S. Abdelhaked,al , [6]discusses that (WSNs) consist of multiple distributed nodes each withlimited resources. With their strict resource constraints and applications characteristics, WSNs contain many challenging trade-o_s. This thesis is concerned with the load balancing of Wireless Sensor Networks(WSNs).It explore the performance consequences of the pheromone-based on load balancing approach[LBA] using a system-level simulator. the algorithm is evaluated on case studies based on sound sensors with different scenarios. of different network topologies. Based on the values chosenfor its parameters is approached as heir performance. Once the parameter values are optimised for the given network topology automatically, Based on load balancing approach using robotic agents the pheromone is improved. It maximise the service availability using the robotic agents as wellas the sensor nodes.

kay soon ed al[7]-explains that [WSN]consists of small nodes with sensing wireless communication capability.routing key technology of wireless sensor network now become hot research.routing protocals in WSNs are also application specific which led to develop varity of protocols.Here breifly describs and disscuss about different routing algorithms for ireless sensor network and compare their strengths and limitations.

I.F.Akyiltiz ed al[8] says about The popularity of wireless sensor neworks [WSN] have increased tremendously in recent time due to growthing micro elecro-mechanical systems [MEMS] technology it has the potenial to connect the physical world by forming network of sensor nodes.Here clustering based routing protocals for WSNs have been disscussed that special nodes called cluster heads,it forms a wireless backbone to the sink each one collect data from sensors belongs to cluster and forward the sink.In hetrogeneous networks powerfull energy devices carried by cluster head where all nodes have uniform and limited resource energy.Cluster formaion,cluster-head election,data aggregation will saves the energy and it reduce data redundancy

Lixia zhang,ed al[9]-refered that the existing network infrastructure or centralized administration used for dynamically forming a temporary network .multiple network [HOPS]maybe need for one node to exchange data with other network. Recently new protocols targeted

specially to develop in this envirnoment.Here present the result of detailed packet-level simulation comparing multi-hop wireless network routing protocol .wireless LAN standard with realistic wireless transmission channel model that present simulation of networks of different nodes.

Y.B.Reddy and Rastko Selmic[10]-The requirement of minimal infrastructure and computation malicious nodes are detucted.the model, requires complex security calculation,computation. They are inefficient due to the resource limitations the research proposed . Current node was maintained by agent based approach. The agent based approach detection is possible through maintaining the ratings of each node. The ratings will be done by finding ratio of the packet forwarded by pockets received.

III. FINDINGS

Over the survey of these papers the following findings are found.

Ref	Findings
1	Optimization technique is used to overcome energy efficiency, quality of service and security management.
2	Particle swarm optimization and ant colony optimization are widely used bio-mimic algorithms
5	To localize the ordinary nodes WSN have location awareness
7	Network is the rising new technology that user to access the information and services
10	An analysis is performed to determine the optimal number of clusters necessary to achieve the highest energy efficiency

IV. CONCLUSION

This paper provides an overview of a range of Bio inspired algorithms drawn from an evolutionary metaphor or natural phenomena.. Although the presented algorithms address many issues associated with optimization in WSNs, some research questions remain relatively unexplored, such as QoS, energy efficiency and security. There is significant scope for future work in these areas. Realizing the importance of these issues in WSNs, the future work is focused on developing a framework which integrates QoS-awareness, energy efficiency and security for Wireless Sensor Networks.

REFERENCES

[1] Md. Akhtaruzzaman Adnan 1,*, Ishtiaque Ahmed 2 and Ismail Fauzi Isnin 3"Bio-Mimic Optimization Strategies in Wireless Sensor Networks: A Survey"

[2] Marwa Sharawi1, Imane Aly Saroit2, Hesham El-Mahdy3, Eid Emary4"Routing wireless sensor networks" International Journal on Soft Computing, Artificial Intelligence and Applications (IJSCAI), Vol.2, No.4, August 2013

[3] I. Akyildiz, W, "A survey on sensor networks," IEEE Commun. Mag., vol. 40, no. 8, pp. 102-114, Aug. 2002.

[4] Royer99]Elizabeth M. Royer, Chai-Keong Toh, "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks", IEEE Personal Communications, Vol. 6, No. 2, pp. 46-55, April 1999.

[5] S. Selvakennedya*, S. Sinnappanb, Yi Shangc"A biologically-inspired clustering protocol for wireless sensor ".Sydney, NSW 2006, Australia.

[6] S. Abdelhak, C.S. Gurram, J. Tessier, S. Ghosh, and M. Bayoumi. ETSSI:energy-based task scheduling simulator for wireless sensor networks. IEEE International Symposium on Circuits and Systems (ISCAS), pages 2821{2824,2011.

[7] low,kay soon,win nu nu and menglooer."wireless sensor network for environment ".computation intelligence for modeling,control and automation,2005 and international conference on intelligence agents,web technologies and internet commerce,international conference on vol,2.JEEE,2006.

[8] I.F.Akyiltiz,w.su,w.sankarasubramaniam and E.cayirci,"A survey on sensor networks communication" magazine,IEEE,vol.40,pp.102-114,2002.

[9] Vadavur bharghavan,alan demers,scott shenker and lixia zhang.MACAW:A media access protocol for wireless LANs.In proceeding of the SIGCOMM,94 conference on communication architectures protocols and applications,aug-1994.

Y.B.Reddy and Rastko Selmic,"secure packet transfer in wireless sensor network"IARA-ICN2011,JAN28-2011-st.marten,pp218-233.