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An Improved Energy Aware Distributed Unequal Clustering Protocol for Heterogeneous Wireless Sensor Networks

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ABSTRACT: The UASN is a chemical sensor that uses batteries as a power source. Due to the difficult environment of UASN, replacing these batteries is difficult. One way to alleviate this problem is to extend the life span of UASN batteries by reducing energy consumption (improving energy efficiency). This proposes an Energy Balanced Inequality Hierarchical Clustering (EULC) algorithm that can improve acoustic sensor operation.
The UASN layer produced by the EULC algorithm differs greatly from the nodes, providing a solution to the "hot spot" problem by building different clusters of similar size. Simulation results show that the EULC algorithm can efficiently balance the energy of the UASN platform, thus enhancing network life.

I. INTRODUCTION

Underwater Sensor Networks
The Wireless sensor networks (WSN) are a set of sensor nodes for performing the collaborative task in a given area. WSN has an extensive variety of potential applications to attract many researchers. WSN are classified in different types such as given below (Aftab et al., 2015): Terrestrial WSN: It is a collection of tiny sensor nodes, which are deployed in a given area. Underground WSN: In an underground WSN, the sensor nodes are buried in the underground for observing the underground conditions. Underwater WSN: It is comprised of sensor nodes and vehicles which are deployed in underwater.

Multimedia WSN: In multimedia WSN, the sensor nodes can handle the multimedia traffic.

Mobile WSN: In mobile WSN, sensor nodes have mobility. Underwater sensor networks (USN) are a collection of sensor nodes and vehicles for performing the cooperative task in the specified region. In autonomous networks, the sensors and the vehicles are self-organized. The network can alter itself for achieving this goal to the features of the marine environment The water covers 75% of the earth's surface. Many resources lie underwater. Those are to be investigated. The current advances in technology have prompted the opportunities to try and do underwater explorations by using sensors at all stages. USN is the combination of wireless technology with a very tiny micromechanical sensor technology that has an intelligent computing, smart sensing, and communication capabilities A sensor network deployed in underwater can monitor physical variables. The various challenges facing designing USN .

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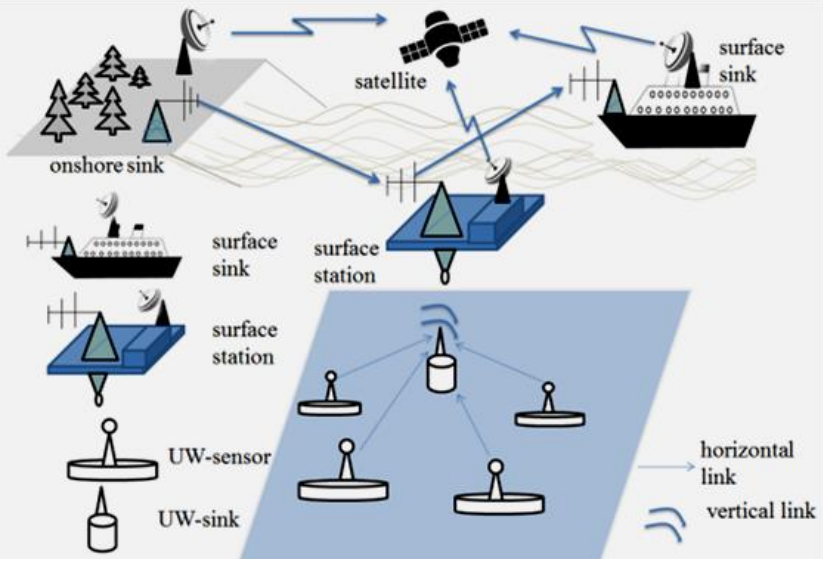

Fig. 1 Architecture of 2-Dimensional USN

II. METHODOLGY

The Acoustic Underwater Network (UAN) has been interested in deepwater demand for military and commercial purposes. In recent years, research interests and efforts based in this field have steadily increased. UAN's wide-ranging applications include, but are not limited to, exchanging transactions between nodes within or outside the network through a single gateway or center. The main purpose of the communication network is to exchange transactions. After gaining the attention of researchers, they have become a major topic in the field of sensor network technology.

The UASN has a limited range of acoustic sensors found in the underwater environment, which makes it very difficult to charge a mobile battery. Therefore, reducing UASN energy consumption, extending network life, and improving energy efficiency have become major issues in the field of UASN research. High-speed protocols, such as cluster assemblies that share sensor cells with multiple groups for distributed management, can improve UASN energy efficiency. In recent years, cluster routing has been widely used through wireless clustering (WSN) .This algorithm is called Low Energy Adaptive Clustering Hierarchy (LEACH), which turns all nodes into play the role of clusters in reducing energy consumption. However, the orientation of the cluster heads is limited and may result in multiple cluster assembly.

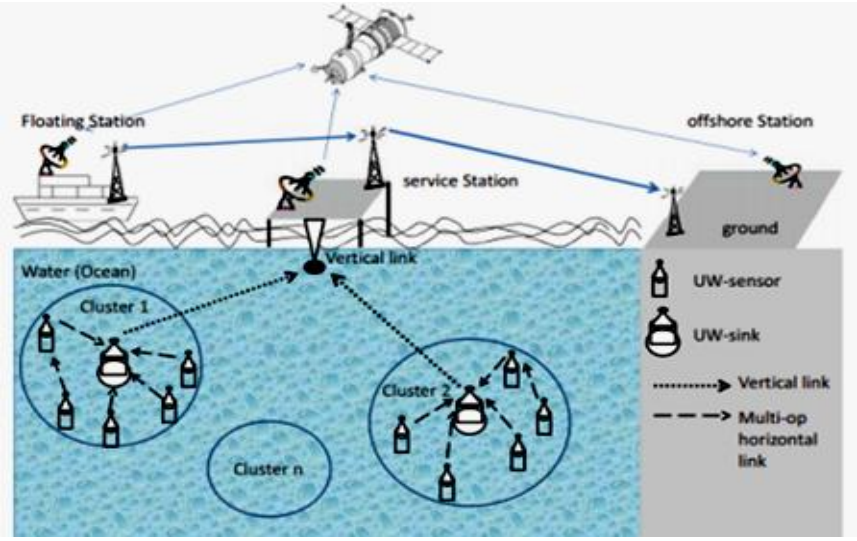

Fig. 2 Under water Sensor Network Architecture[10]

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III.PROPOSED SYSTEM

In the proposed framework, the algorithm used is Energy Balanced Inequality Hierarchical Clustering (EULC), which divides the UASN into several layers based on the depth and the mixing within each layer. The algorithm selects the cluster head to look at the residuals of each node, the specifications and the distances of the converter nodes, making the cluster head distribution consistent. To reduce energy consumption in the network, select the next hop node depending on the energy and the depth. EULC ranks among the most active DEBCR and LEACH on energy consumption, single-line management, and network life, ensuring energy efficiency using the EULC with UASN.

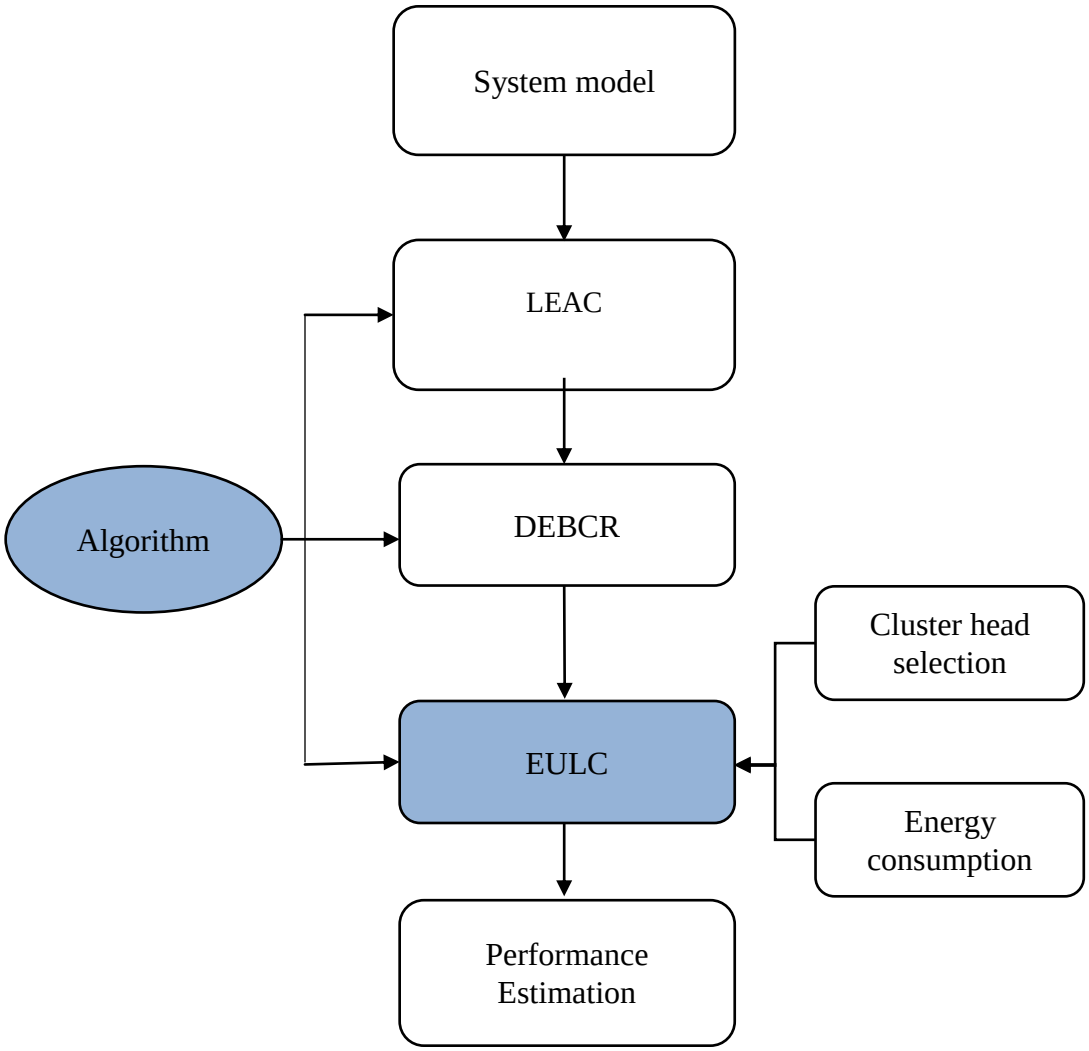

Fig. 3 proposed flow Diagram

It is difficult to replace these batteries in underwater systems using UASN. One way to alleviate this problem is to extend the life span of UASN batteries by reducing energy consumption (improving energy efficiency).
An algorithm for Energy Balanced Inequality Hierarchical Clustering (EULC) that can improve the efficiency of acoustic energy. The EULC algorithm generates a UASN with a layer that differs from the depth of the node, providing a solution to the "hot spot" problem by building different clusters of the same size. Simulation results show that the EULC algorithm correctly balances the energy in the UASN arena, extending the network life.

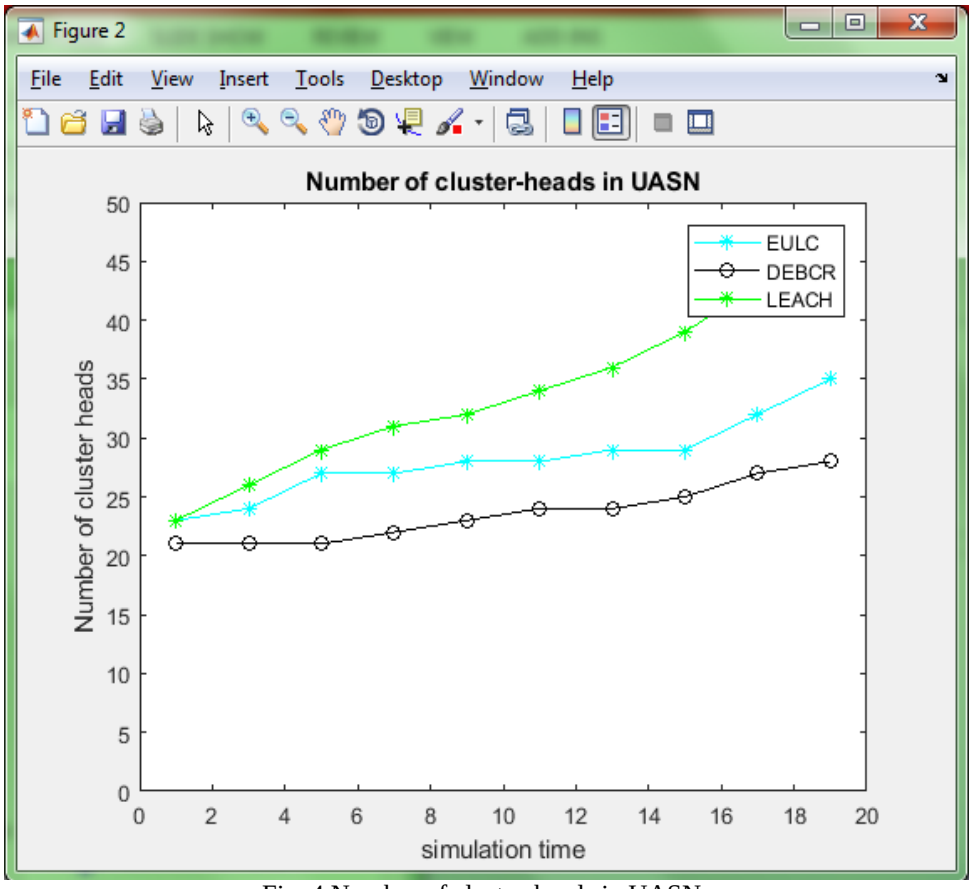

Fig. 4 Number of cluster-heads in UASN

IV.CONCLUSION

Energy efficiency has a direct impact on the life of the UASN. In each cluster, the non-cluster head sends packets to the cluster head, and the cluster head integrates those packets and exports the results to the next cluster head, which is further synchronized and exported. going up. In EULC, each cluster's header contains the information table for the adjacent cluster. This paper proposes the UASN standard for Energy Balanced Inequality Hierarchical Clustering (EULC). The main advantage of EULC is that the layers are not uniformly based on the depth of the sensor node; when selecting the cluster head, the remaining energy, the distance of the converter nodes and the height of the nodes; "Hot spot" problems; and it is based on the energy edge and node distance to determine the best hop response that EULC performs better than the DEBCR and LEACH algorithms in terms of energy consumption, head management cluster and network life, confirming it as EULC Success at UASN.

V.FUTURE WORK AND CHALLENGES

Most protocols that offer for the underwater acoustic sensor network consider statistical nodes and / or anchor nodes with limited mobility and ignore the free and nonspecific water sensor nodes together in free float free. Position of motion Sensor nodes cannot move freely in running water. Examining this situation will bring new challenges and major changes to the popular architectural system that is considered in most of the advanced designs offered by the submarine acoustic sensor network. For example, with the free movement of the sensor node, the separation of the network becomes inevitable as the series moves nonstop over time.

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