Safety Measures in Underwater Aural Sensor Network: Issues and Challenges with Applications

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Abstract

This paper scrutinizes a many-sidedness of slant and summons and enactment on the scrutiny of under-Water Acoustic Sensor Networks (WASN). Mostly still not investigated frontier as compared to mundane sensors\ networks. This scrutiny pinnacles various applications such as oceanographic data collection, offshore exploration, underwater robotics, disaster prevention, pollution monitoring, and fault detection. And also deals with scrutiny issues such as limited bandwidth, restricted battery power, propagation delay, high cost, failure of sensors due to fouling and corrosions. Additionally we handle with an effective network management, energy regeneration and security and privacy in WASN.

Keywords: Oceanographic Data, Temperature Sensor, Under-Water Acoustic Sensor Networks (UWASN), AUCs

1. Introduction

In this earth, more than 71 percent of the earth's surface is covered by water. In that more than 96.5 percent of water is covered by ocean. Based on terrestrial research we can easily detect the nodes in the terrestrial sensor network with security. But its very difficult to detect nodes in ocean based sensor networks. If suppose it is possible with difficulties to detect nodes from ocean based, then it may not be with security. The third parties may involve with this and easily retrieve the nodes by transmission. And also make problem with disasters in the ocean. In this paper, we have undertaken these problems. Sensor networking has a outspread spectrum of applicability, monitoring environments, tracking the pollution, preventing a disasters, collections of oceanographic data.

In a existing system, I have done invasion recognition in the sea's surface. It fully covered a wide area through WSN. It identifies the intrusions, identifies the crafts over ocean with the help of three-axis accelerometer sensors, and also extracts the secret nodes with secret key extraction in MIMO. In this paper, mainly focus on ocean based systems. Here the most highlighted in an effective network management, energy regeneration and security and seclusion in UWASN.

2. Literature Survey

Aditya Tandon and Kamal Kant¹ recommended in the topic of a novel positioning technique for 3D underwater sensor network, in that highlighting positioning or localization because they have analyzed underwater sensor networks are very far than the terrestrial sensor networks, so planned to positioning in underwater with the help of UUV-guided position system in an UW-ASN. And also uses a new algorithm, i.e., MCM Mining Counter Measure applications.

Dhyanesh and Ravghvan¹¹ suggested pertinentable of sensors to sea related disaster management with shortrange and low power in Sensors On Sea (SOS): A simple novel sensor-based best effort system for ocean related disaster management.

Jaydip M Kavar and Wandra² presented clarity with underwater wireless sensor network. It has deployed monitoring areas in various applications like sea sampling network, submarine election, etc in survey papers on underwater wireless sensors network. Manu Singh and Tanu Singh² slanted two dimensional and three dimensional architectures based on various applications via, data collection, underwater robotics, pollution monitoring, prevention of disaster, etc in the topic of prevailing issues and research confront in underwater acoustic sensor network. Feng Zhang[®] researched on WSN communication in underwater sensor networks for monitoring the limitation of water, oilfield monitoring, data collections, etc in underwater sensor networks for water quality monitoring.

Mohsin Murad, et.al.³ explored radio frequencies for transmitting data and information as like terrestrial and airborne wireless sensor network. It requires sea exploration for communication in the topic of a survey on current underwater acoustic sensor network applications.

Xiaojiang Du and Hsiao-Hwa Chen⁴ suggested security and privacy in wireless sensor security. It has challenged the sensor nodes in terms of communication, memory and energy supply in the basis of security in wireless sensor networks.

3. UWASN Applications

UWASN application pinnacles various partitioning while keeping the sensor into the ship. Then it will automatically sensing the ship so it is possible to find out the oceanographic data collection, preventing the disaster, pollution monitoring, fault selections, offshore exploration. The sensor nodes will fix into the sea floor and places the sensor nodes. In that way, it communicates the network between multiple AUCs and then it exchanges information with each other for an effective management.

Vessel communicates into the ocean floor through the sensor nodes when fixing the sensor in to the ship. And that will communicate to the control system. This shows in this architecture (Figure 1).



Figure 1. Sensor nodes architecture.

It can easily identify the vessels by sensing, not only vessels, it detects intruders while sensing through these kind of operations with their applications. And also it avoids the network loss by doing each other communications.

Due to multiple paths, fading and limited bandwidth in UWASN, it collects the transmission signals with different delays. The platform can get an effectual monitoring system that may harmonize with neighbors in the proximity to perform. And it causes safety purpose. Because it passes the information with their neighbors, it causes more security. It spreads and increases the information with its neighbors. By doing this type of process, it increases the battery power, reduce the high-cost. The third parties are not able to obstruct by exchanging communications and also fault can't be happen, it detects the fault by exchanging the wireless sensor communications. By doing this kind of process it maintains an effective management and energy regeneration and performs security and privacy (Figure 2).



Figure 2. Sensor node to temperature sensor.

This manner shows that temperature sensor, possible to stumble on out the oceanographic data collection, preventing the disaster, pollution monitoring, fault selections, offshore exploration. Temperature gets collected from ocean and exchanges the information into the sensor node. It passes the communication into their neighbor node and that will passes to the cluster. Each communications maintains by the head of the cluster and the head of the cluster communicate into control system. All the sensor nodes are scheming by control system. It will be more secured and maintains privacy when doing this type of process.

4. Conclusion

In this paper, we have discussed a most recent application of UWASN. For the most part probably, we brought to illumination in endeavor of assorted applications in different areas of acoustic communication. I also maintain the range and bandwidth of UW communication. Also shows regenerating the energy and security and privacy.

5. References

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