International Journal of Wireless Networks and Broadband Technologies
Volume 10 • Issue 1 • January-June 2021

Networks of Underwater Sensor Wireless Systems:
Latest Problems and Threats

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ABSTRACT

Underwater wireless networks have been the subject of considerable attention in research and development by both academia and industry, while applications are expanding to a wide range of uses, including industrial, scientific, military, and environmental applications. The paper presents a analysis of the underwater wireless sensor network, a system that is promising to reveal the secrets of marine life and other underwater applications. The information about the underwater channel was listed with a focus on communication of both the acoustic and optical kind. Then, the node location strategies and related protocols for routing that can be applied to the desired communication type were discussed briefly. The hard environment and peculiar features of UWSNs are responsible for efficient communication between sensors in UWSNs. This paper proposes a robust and energy-efficient UWSN location-free routing system, based on constraint. RE-PBR takes into account three criteria, including performance, depth, and residual power connections, to balance energy consumption and to produce usable results. The findings of the simulation show that the proposed work decreases travel costs and by using less energy increases the network's life.

KEYWORDS

Energy-Efficient Routing Protocol, MATLAB, Optimizing Network Life, Underwater Wireless Sensor Network, Wireless Networks

1. INTRODUCTION

In recent years, wireless sensor networks underwater have shown growing interest. In a number of uses, subsequent sensor networks can be introduced. Implementation is important in its domain but some may enhance the scanning of the ocean in order to meet the numerous applications in the underwater environment, including natural disaster alert systems, assisted navigation, oceanographic information and underwater surveillance, ecology, industrial uses, etc. For example, sensors can track the structural quality of the mooring environment by measuring certain parameters for offshore-engineering applications such as the basis strength and mooring tension (Albukhary & Bouabdallah, 2019). UASN provides a new communication site to explore the underwater world. UASN's understanding of marine phenomena such as climate change, aquatic animal life and biodiversity of coral reefs has also increased. The positioning scheme is recursive and the localization process requires various

DOI: 10.4018/IJWNBT.2021010104

sensor nodes. UASN's ability to find a submarine operating system, monitoring and countermeasure algorithms also enhances the naval forces 'capabilities for submarine warfare. UASN technology also leads to earthquakes and earthquakes pre-warning. A particular device is known as 3-DUL, which consisted of only three anchor sensor nodes, such as water surface blower systems, that diffused their global location data in all three directions and 3-DUL followed a two-phase procedure. Distance to nearby anchor nodes is determined by an unknown node during the first level. Developing low sensors has resulted in the use of large WSNs from accessible areas to remote areas in any possible area of use. WSNs are used in a range of applications including the detection of battlefields, the building inspection, the imaging of target areas, detecting environmental factors motion, sound, light or other objects presence, such as temperature, inventory management and disaster management. Consequently, WSN work focuses on designing and implementing an effective routing strategy. A sensor node may be used as a source, a relay, or a destination in cooperative communication. There are two common methods of communication: forward and AF and decode (Yang et al., 2018). The received signal is amplified and transmitted to the target node via a relay in the previous process. Nonetheless, in the later technology, the corrupted version of the received signal is encoded and relayed to the target. The efficiency analysis of the AF cooperative scheme was extensively studied, including the calculation of the signal-to-noise ratio and likelihood of failure. However, very little cooperation routing strategies have been developed with the strategy for relay selection and mobile sinks, and the analysis of relay technology to enhance network performance. The SNR of the relations between sources and relay nodes is calculated in incrementally best relay methodology based on which the relay node is selected. Wireless networks for underwater sensors are suitable for diverse applications, such as safety, military, surveillance of pollution, tsunamis, mining offshore, shipping, detection of gas / oil depletion and tactical monitoring. The Wi-Fi network is very distinct from the Terrestrial Sensor Networks (Khasawneh et al., 2018).

This study aims to simulate the survey on underwater optical communication techniques, managing traffic using sensor nodes, shortest path detection and Techniques for improving data rate and energy efficiency. The scenario focuses on the node number that sends the measurement data packets to a sink node. This paper describes the major contributions as follows.

1. Survey on underwater optical communication techniques.
2. Comparison on underwater communication techniques with free space optical communication.
3. Data collection from integrated sensor.
4. Managing traffic using sensor nodes and shortest path detection.
5. Techniques for improving data rate and energy efficiency (Kumari et al., 2019).

This paper is classified such as: Section 2 informs the literature work. Section 3 provides an overview of the simulated methodology. Section 4 discusses the findings of comparisons and then Section 5 of the document.

1.1 Underwater Wireless Sensor Networks

Since World War II, underwater communication has begun where some underwater telephones were installed in 1945 to communicate with deep-sea submarines, but since then there has been little research done to make this underwater communication an unknown field. This area of UWSN, however, has recently been so attracted by researchers worldwide who have started studying marine environments for science, the climate and the tactical marine need in this region. UWSN's will play a crucial role in the potential Ocean Monitoring Network in the near future, where the tasks involve finding objects on the seabed, Collect scientific data, regulate emissions, air monitoring and send images from remote locations that will be of assistance to us all. One example of application is the tsunami monitoring system used for tracking earth's seismic activity and early distribution of tsunami warnings to mainland (Goyal et al., 2018).