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Deep Sea Fisherman's App using WWSN

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Abstract: *In this study, we present a method for recognizing daily living activities using Doppler sensors with extended detection ranges, addressing key challenges in cost, accuracy, user convenience, and privacy preservation. We highlight the importance of accurate and affordable activity recognition for enabling advanced services in energy-saving home appliance control and other daily life applications. The proposed method leverages Doppler sensors' capabilities to detect dynamic objects and achieve precise recognition of a wide range of activities, including location-independent tasks like reading. Our evaluation includes optimizing recognition accuracy through logistic regression and assessing ensemble methods to enhance performance. Additionally, we explore the impact of sensor reduction strategies on recognition accuracy, demonstrating the potential of this approach to streamline sensor deployment while maintaining effectiveness. This research contributes to advancing sensor-based technologies for improving everyday life services, emphasizing practical solutions that prioritize cost-effectiveness and user experience*

Keywords: Sensor Module, Transmitter Module, Receiver Module, Controller Module

I. INTRODUCTION

Deep-sea fishing is a challenging and crucial industry that relies on accurate real-time data to optimize operations and ensure safety in remote ocean environments. The advent of Wireless Sensor Networks (WSNs) has opened new possibilities for enhancing the efficiency and effectiveness of deep-sea fishing practices. In this context, we propose the development of a Deep Sea Fisherman's App using Wireless WSN(WWSN) technology to revolutionize the way deep-sea fishermen operate and monitor their activities.

The Deep Sea Fisherman's App utilizing WWSN aims to provide a comprehensive and user-friendly solution that integrates various sensor modules, including transmitter, receiver, and controller modules, to gather critical data from deep-sea environments. This app will enable fishermen to monitor essential parameters such as ocean temperature, salinity, water depth, and weather conditions in real-time, facilitating informed decision-making and improving overall safety during fishing expeditions.

By leveraging WWSN technology, our app will establish a robust and reliable communication network underwater, enabling seamless data transmission between sensor modules and the fishing vessel or shore station. This capability is vital for improving operational efficiency, optimizing fishing strategies, and ensuring the well-being of fishermen working in challenging marine environments.

The Deep Sea Fisherman's App will empower fishermen with actionable insights derived from the collected data, such as identifying optimal fishing spots based on environmental conditions and predicting potential risks or hazards. Moreover, the app will facilitate communication and coordination among fishing crews and enable prompt response to emergencies or changing conditions at sea.

II. MODULES

2.1 SENSOR MODULE

A GPS module can provide real-time location tracking, allowing fishermen to know their exact coordinates at all times. This information can be crucial for navigating safely, especially near international maritime boundaries where fishermen may inadvertently cross into foreign waters.

These sensors can detect nearby vessels or obstacles, alerting fishermen to potential collisions.

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This is particularly important in areas with heavy maritime trafficor where sea pirates may be lurking.
As mentioned earlier, integrating a water communication transmitter can enable fishermen to send emergency alerts even when they are out of range of traditional communication methodslike mobile networks.

2.2 TRANSMITTER MODULE

Integrating a transmitter module into a project can significantly enhance its capabilities for communicating emergency alerts and ensuring the safety of fishermen.
This hardware should be rugged, waterproof, and capable of withstanding exposure to saltwater and other elements.
Integrate a physical or virtual emergency alert button into your transmitter module to allow fishermen to quickly and easily send distress signals in case of emergencies such as piracy attacks, medical emergencies, or vessel malfunctions.

2.3 RECEIVER MODULE

Implementing a receiver module in a project can complement thefunctionality of your transmitter module by enabling authorities or designated recipients to receive and respond to emergency alerts from fishermen.
This allows for seamless communication and reception of emergency alerts transmitted by fishermen.
Select a receiver hardware module capable of receiving signals transmitted by the transmitter module over the chosen communication protocol. Consider factors such as receiver sensitivity, signal processing capabilities, and integration with other communication systems or networks.

2.4 CONTROLLER MODULE

Integrating a controller module into your project can serve as the central processing unit responsible for coordinating the functionsof the sensor, transmitter, and receiver modules.
Interface the controller module with the sensor module to gather real-time data on environmental conditions, vessel status, and crew well-being.
Handle alert notifications, prioritize emergency messages, and coordinate responses with relevant authorities or response teams based on the severity and location of the incident.
Verify the functionality, performance, and reliability of the system through rigorous testing protocols and validation procedures.

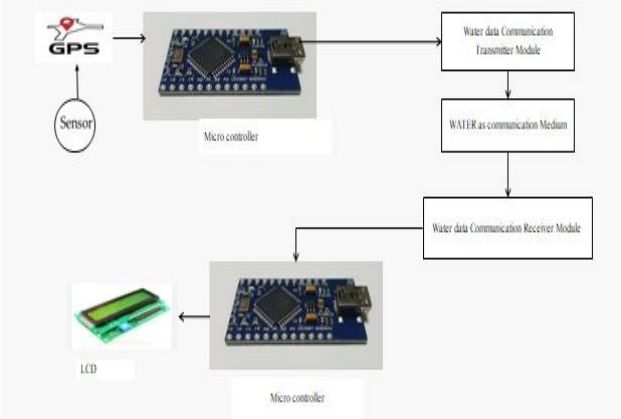

Figure 1.1 SYSTEM ARCHITECTURE

A. Sensor Node Development

Develop the sensor node using a microcontroller (e.g., Arduino Nano) connected to water quality sensors (e.g., pH sensor, temperature sensor).
Implement data collection and processing on the sensor node.
Integrate a Water Data Communication Transmitter Module for transmitting data through the water medium.

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B. Communication Infrastructure

Implement a communication protocol suitable for underwater data transmission using the water as the communication medium.

Develop the Water Data Communication Transmitter Module to send sensor data through the water.

Design the Water Data Communication Receiver Module to receive data transmitted through water.

C. App Development

Develop the Deep Sea Fisherman's App interface for mobile devices (e.g., smartphone or tablet).

Implement features such as real-time monitoring of water quality parameters (pH, temperature, etc.) and underwater conditions

Include functionalities for displaying received data from theWWSN.

III. FUTURE WORK

For the Deep Sea Fisherman's App using WWSN could focus on enhancing sensor capabilities by integrating additional sensors to monitor parameters like dissolved oxygen, turbidity, salinity, and underwater currents. Exploring advanced sensor technologies would improve accuracy and reliability in challenging underwater environments. Optimization of communication protocols specific to underwater data transmission is essential to increase data transmission rates and range within the water medium. Integration of AI and data analytics could enable predictive insights for fishermen, such as fish migration patterns or optimal fishing locations based on environmental data. Enhancing the mobile app's user interface and features, including historical data analysis and customizable alerts, would improve user experience and utility. Long-term deployment studies in various deep sea fishing regions would provide valuable insights into system performance and impact on fishing practices. Additionally, research into energy-efficient designs and power management strategies for WWSN nodes would prolong battery life and enhance sustainability.

IV. CONCLUSION

The development and implementation of the Deep Sea Fisherman's App using Wireless Water Sensor Networks (WWSN) hold significant promise for revolutionizing deep sea fishing practices and environmental monitoring. By leveraging advanced sensor technologies and optimized communication protocols tailored for underwater environments, the app can provide real-time data on crucial parameters like water quality and environmental conditions. Future enhancements, including the integration of additional sensors, AI-driven analytics, and improved user interface features, will further enhance the app's utility and user experience. Long-term deployment studies and collaboration with stakeholders will be key to refining the app's performance and ensuring its practicality in real-world fishing scenarios. Ultimately, the Deep Sea Fisherman's App using WWSN represents an innovative approach to sustainable fishingpractices and marine resource management, empowering fishermen with valuable insights for informed decision-making and conservation efforts in deep sea environments.

REFERENCES

[1]. S. Mani Sunder, Deep sea fishermen patrol system forcoastal intruder positioning.

[2]. R.Karthikeyan,A.Dhandapani, Protecting of Fishermenon Indian Maritime Boundarie.

[3]. U.Mahalingham, Navigation Alert System for FishermanUsing Lab-View.

[4]. M. Rajaparthiban, P. Ashvini, R. Dhivyadive, Multi Purpose Marine Wireless Networks For Fisherman Aid And Other Applications.

[5]. S. Misaki, K. Umakoshi, T. Matsui, H. Choi, M. Fujimoto, and K. Yasumoto, ‘‘Non-contact in-home activity recognition system utilizing Doppler sensors,’’ in Proc. Adjunct Int. Conf. Distrib. Comput. Netw., Jan. 2021, pp. 169–174.

[6]. T. L. M. van Kasteren, G. Englebienne, and B. J. A. Kröse, ‘‘An activity monitoring system for elderly care using generative and discriminative models,’’ Pers. Ubiquitous Comput., vol. 14, no. 6, pp. 489–498, Sep. 2010, doi: 10.1007/s00779-009-0277-9.

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[7]. X. Luo, Q. Guan, H. Tan, L. Gao, Z. Wang, and X. Luo, ‘‘Simultaneous indoor tracking and activity recognition using pyroelectric infrared sensors,’’ Sensors, vol. 17, no. 8, p. 1738, Jul. 2017.

[8]. S. Inoue and X. Pan, ‘‘Supervised and unsupervised transfer learning for activity recognition from simple in-home sensors,’’ in Proc. 13th Int. Conf. Mobile Ubiquitous Syst., Comput., Netw. Services. New York, NY, USA: ACM, Nov. 2016, pp. 20–27, doi: 10.1145/2994374.2994400.

[9]. G. Laput and C. Harrison, ‘‘Exploring the efficacy of sparse, generalpurpose sensor constellations for wide-area activity sensing,’’ Proc. ACM Interact., Mobile, WearableUbiquitous Technol., vol. 3, no. 2, pp. 1–19, Jun. 2019, doi: 10.1145/3328926.

[10]. N. Xiao, P. Yang, X.-Y. Li, Y. Zhang, Y. Yan, and H. Zhou, ‘‘MilliBack: Real-time plug-n-play millimeter level tracking using wireless backscattering,’’ Proc. ACM Interact.,Mobile, Wearable Ubiq