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DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

16EI262 Project Work

ANTI-DROWNING SMART BAND

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AIM

To design a device that can assist individuals in staying afloat in water, even if they are not skilled swimmers.

OBJECTIVES

- To save people from drowning.
- To find the person's location in the area.
- To sends a distress signal to alert nearby individuals or coast guards to rescue those in need.

LITERATURE SURVEY

S.No.	Author & Title	Findings
1.	Development of a Smart Wearable Anti-drowning System for Swimmers Department of Computer Engineering, Federal University of Technology, Minna, Nigeria 2018	• The system is designed to detect the heartbeat rate and tilting pattern of swimmers using two sensors: a pulse sensor and an accelerometer • Heart rate sensors may not always be accurate, especially if the device is not properly calibrated or if the user has certain medical conditions.
2.	N. M. Hamdan ,"Drowning Detection System Using Wearable Sensors: A Review" Proceedings of the 2021 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), pp. 432-436, 2021. .	• The system contains a wearable sensors for drowning detection, including their types, sensing principles, and applications, with a focus on the use of machine learning algorithms • Wearable sensors like heartrate sensor will not give a stable input.
3.	"Development of a smart life jacket for improved water safety" by V.M. Balasubramanian et al. (2017).	• Its a life jacket with integrated sensors that can detect changes in water depth, body position, and vital signs. • However, they noted that the device may not be suitable for all water activities or for people with certain medical conditions.

PROBLEM IDENTIFICATION

- Aquatic activities require knowledge about water bodies and how to survive in them, and drowning is a serious problem that causes a significant number of deaths each year.
- The WHO also reports that an estimated 372,000 people die from drowning each year, with children being particularly vulnerable.
- In fact, it accounts to be the third major cause with respect to the same, and 7% of all deaths that are injury-related.

EXISTING AND PROPOSED METHODOLOGY

EXISTING METHODOLOGY

- The Anti-drown Portable Inflatable Bag is a safety device that can be activated manually by pulling a pin to inflate the air-bag.They also have a compass and a whistle as a safety measure.

PROPOSED METHODOLOGY

- This product is designed to streamline manual processes and improve safety for individuals in emergency situations. With an inbuilt GPS and GSM module, the device can automatically transmit the user's location to designated contacts or emergency services, providing quick and accurate information in case of emergency.
- In addition, the device also features a physical SOS signal, which can be activated easily by the user to call for help in urgent situations.

BLOCK DIAGRAM

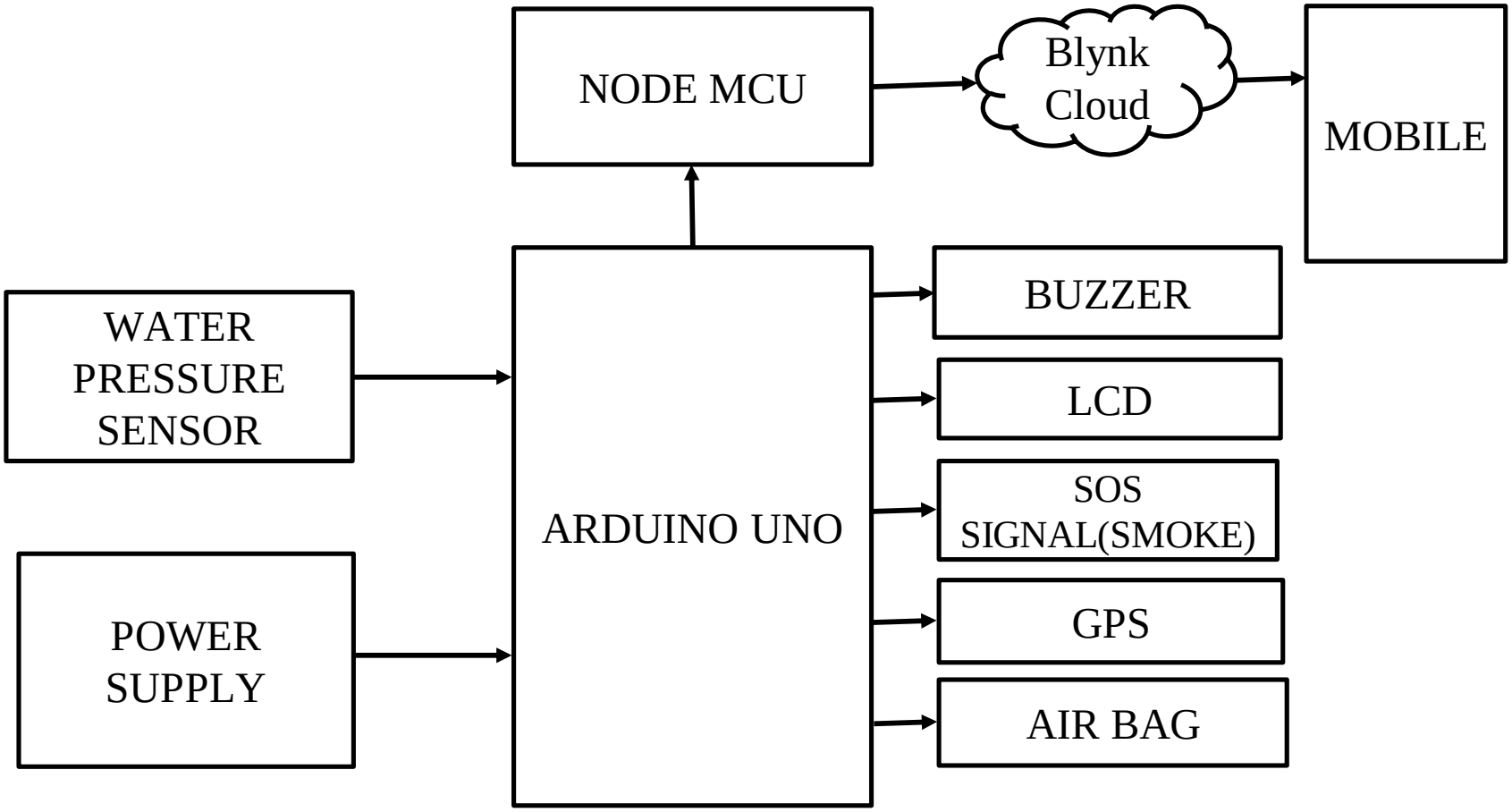

Fig.1. Block Diagram of Anti Drowning Smart Band

DESCRIPTION OF BLOCK DIAGRAM

- Lifejacket are used for the kind of situation which is mentioned in the problem statement. This device offers a more comfortable and space-saving alternative to traditional lifejackets.

- This device consists of Pressure sensor , GPS tracker , Anti drowning airbag, LCD, Node MCU and Buzzer,

- A pressure sensor detects water pressure by measuring the force exerted on a diaphragm, which increases as an object goes deeper underwater.

- NodeMCU is an open-source firmware with available prototyping board designs. The term "NodeMCU" combines "node" and "MCU," referring to the firmware. It is not specific to any development kits.

HARDWARE AND SOFTWARE SPECIFICATIONS

Hardware Specification:

Components	Specification
Water Pressure Sensor	0~1.6 Mpa
GPS Module	3.2 - 5 V
Arduino Board	6 - 12 V

Software Specification:

Software	Description
Blynk App	Version 1.7.6
Arduino IDE	Version 2.0

EXPERIMENTAL SETUP

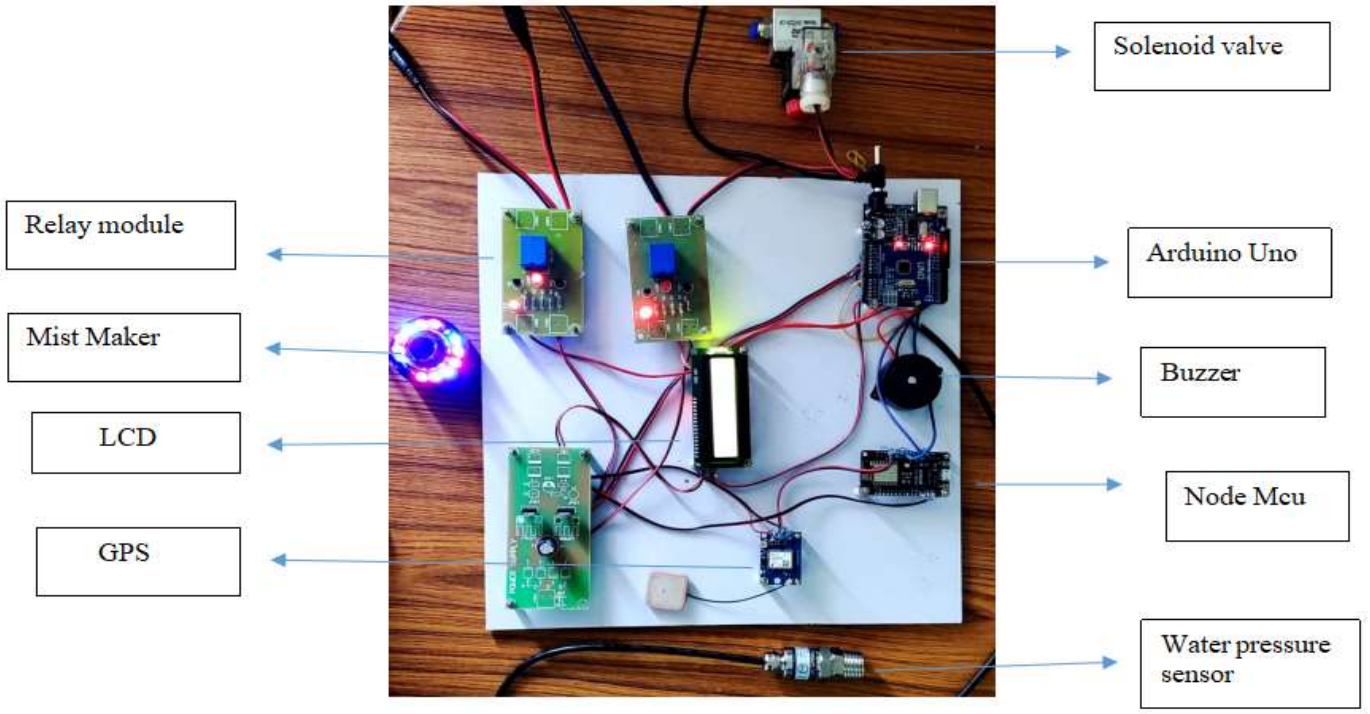

Fig. 2 Experimental setup of Anti Drowning Smart Band

RESULTS AND DISCUSSION

Fig. 3 GPS Tracking of Anti Drowning Smart Band

CONCLUSION AND FUTURE SCOPE

- The proposed anti-drowning smart band using a water pressure sensor is a promising solution for preventing drowning incidents in swimming pools and beaches.
- Overall, the proposed anti-drowning smart band using a water pressure sensor has great potential for improving swimming safety and preventing drowning incidents. With further development and optimization, it can become a widely adopted solution for ensuring the safety of swimmers in various aquatic environments.
- One possible direction is to incorporate machine learning algorithms to the system to improve the accuracy of the depth detection and to provide personalized alerts based on the swimmer's swimming patterns and behaviour.

DEMO VIDEO

https://drive.google.com/drive/folders/1n0f1ky8aZhbhJqGVoNIL3mgWYQDZaiQH

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THANK YOU