IMPLIMANTATION OF EARLY FLOOD DETECTION AND AVOIDANCE ALERT SYSTEM BASED IOT ANDROID APPLICATION

Vaishnavi R. Madankar, Rugwed S. Tembhare, Deepak Pache, Gajanana Gahule, Rajat Kuthe,

Prof. Diksha Khare mam

Gurunank institute of engineering and technology Nagpur

ABSTRACT

The project "Implementation of Early Flood Detection and Avoidance Alert System Based on IOT Android Application" aims to develop a system that can detect floods at an early stage and provide timely alerts to people in flood-prone areas. The system uses IOT sensors to collect data on water levels, weather conditions, and other parameters, which are then processed and analyzed to identify potential flood situations. An Android application is developed to provide real-time alerts to users, enabling them to take necessary precautions and avoid dangerous situations.

Keywords:- *IOT, Arduino UNO, wifi module, sensor*

INTRODUCTION

Floods are one of the most destructive natural disasters, causing significant damage to property and endangering lives. Timely detection of floods and provision of early warning systems is crucial in minimizing the impact of these disasters. This project, "Implementation of Early Flood Detection and Avoidance Alert System Based on IOT Android Application," aims to develop a system that can detect floods at an early stage and provide timely alerts to people in flood-prone areas. The proposed system uses IOT sensors to collect data on water levels, weather conditions, and other parameters, which are then analyzed to identify potential flood situations. An Android application is developed to provide real-time alerts to users, enabling them to take necessary precautions and avoid dangerous situations. The proposed system can help minimize the loss of life and property caused by floods, making it a valuable tool for disaster management.

PROPOSED WORK

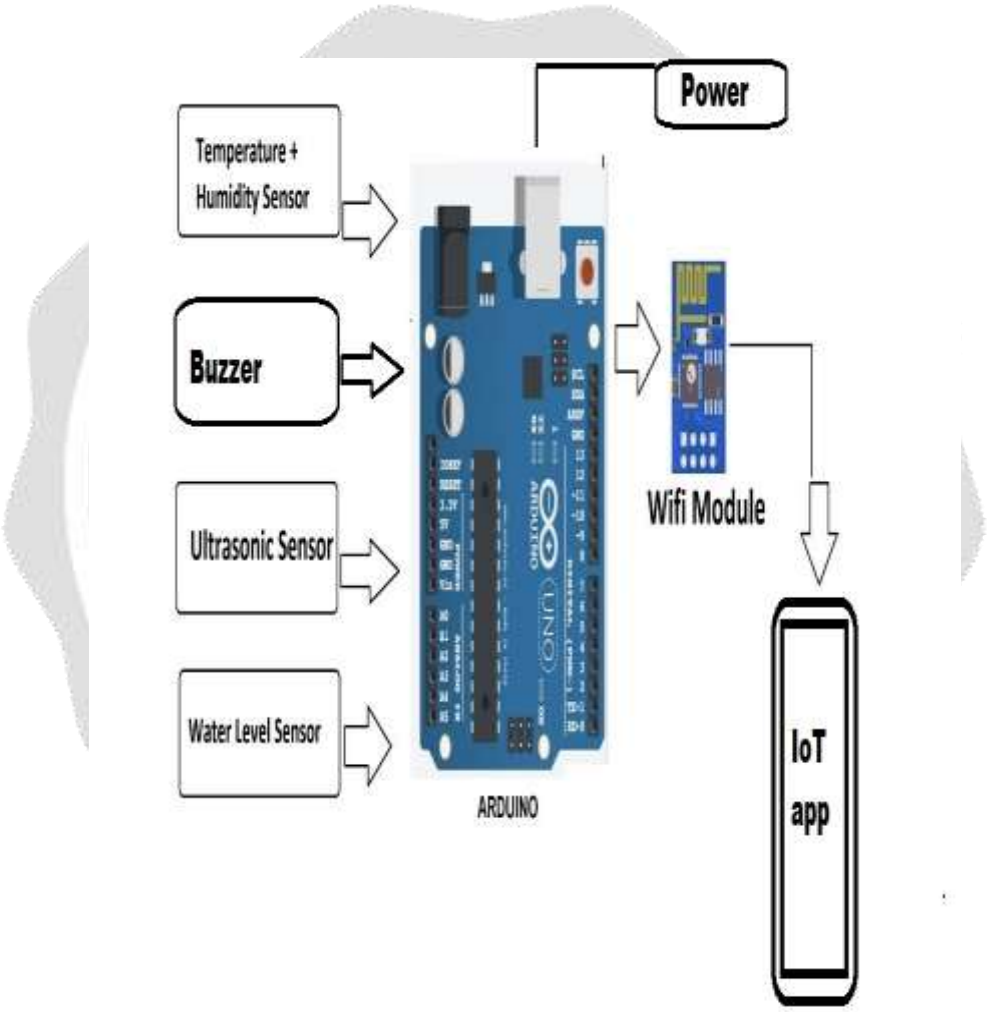
The "Implementation of Early Flood Detection and Avoidance Alert System Based on IOT Android Application" works as follows:

Sensor data collection: The system uses IoT sensors to collect data on water levels, weather conditions, and other parameters. Data processing and analysis: The collected data is processed and analyzed to identify potential flood situations. This includes identifying sudden changes in water level, rise in water temperature, or excessive rainfall. Alert generation: If the system detects a potential flood situation, an alert is generated using the Android application. The alert can include details about the location and severity of the flood, along with instructions on what actions to take.

User response: The Android application provides real-time alerts to users, enabling them to take necessary precautions and avoid dangerous situations. Users can also use the application to report any incidents or seek help during a flood.

Flood management: The data collected by the system can also be used by local authorities to manage floods and take necessary actions to mitigate their impact.

Overall, the system provides an early flood detection and avoidance alert system that can help minimize the loss of life and property caused by floods. It is a valuable tool for disaster management and can be used by individuals, communities, and local authorities to better prepare for floods and manage their impact.



proposed system is given below:

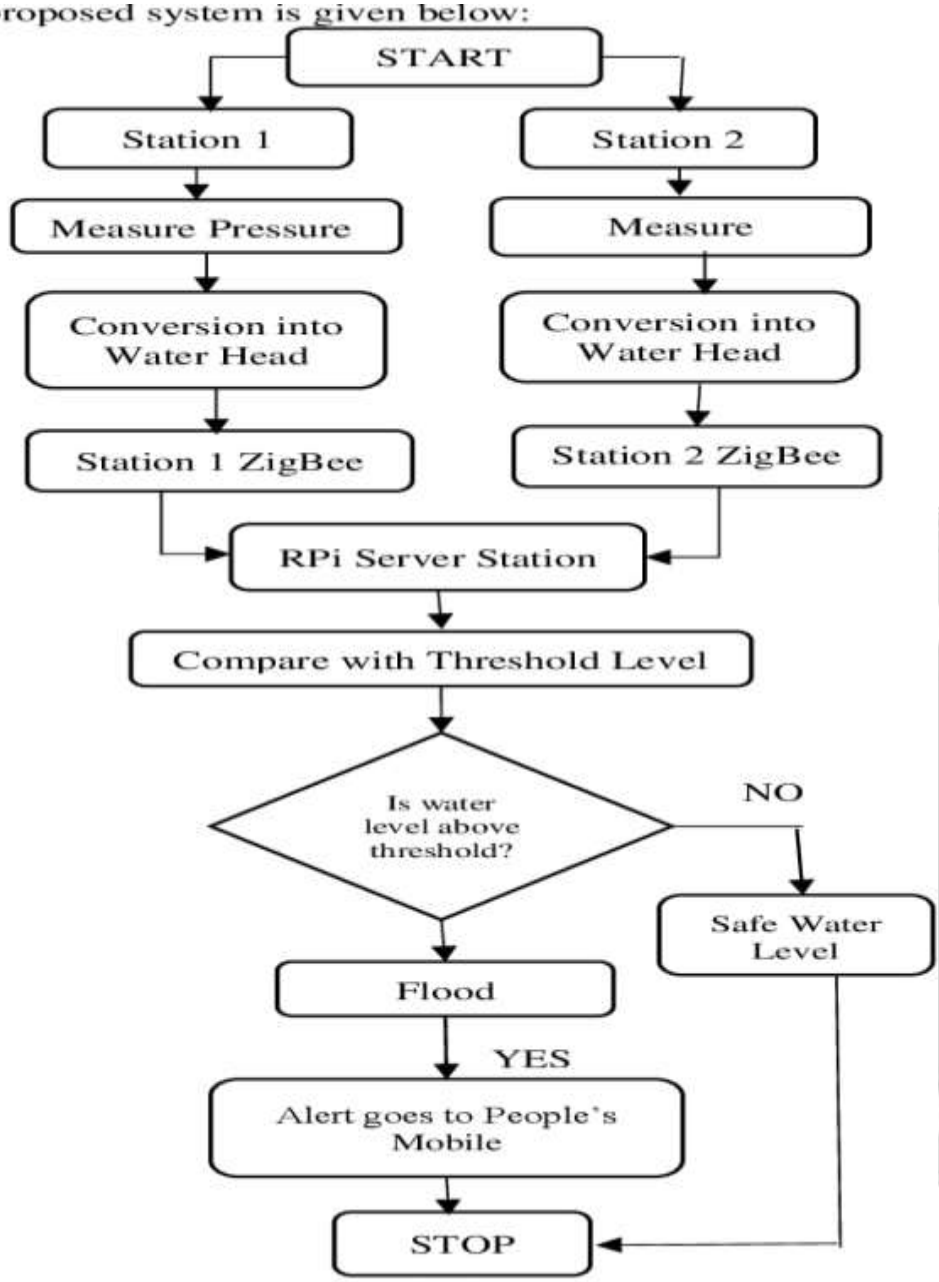


Fig. 1 Flow-chart of Proposed System

COMPONENTS AND DESCRIPTION

1) Hardware Specifications
2) Arduino Uno
3) Wifi Module
4) Temperature Humidity Sensor
5) Ultrasonic Sensor
6) Water Flow Sensor
7) Water Level Sensor
8) LCD Display
9) Resistors
10) Capacitors

11) Transistors
12) Cables and Connectors
13) Diodes
14) PCB and Breadboards
15) LED
16) Transformer/Adapter
17) Push Buttons
18) Switch
19) IC
20) IC Sockets
21) Software Specifications
22) Arduino Compiler
23) MC Programming Language

1) Arduino uno R3 : The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

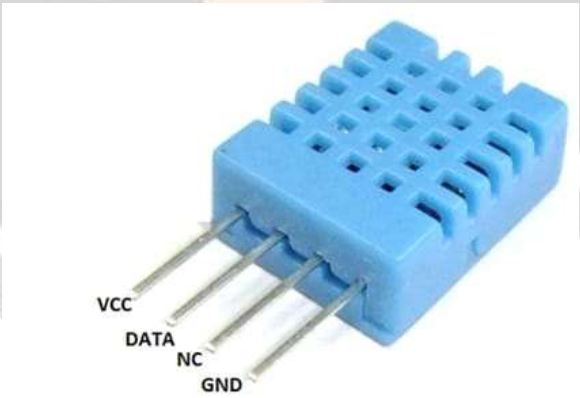


Fig. Arduino uno R3

2) DHT11 sensor: DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. By using the exclusive digital-signal-acquisition technique and temperature & humidity sensing technology, it ensures high reliability and excellent long-term stability.

Fig. DHT11 sensor

3) Water level sensor : if you have ever had a water heater explode or ever tried to make submersible electronics, then you know how important it is to detect when water is around.

Fig. Water level Sensor

4) Ultra Sonic sensor : If you have ever had a water heater explode or ever tried to make submersible electronics, then you know how important it is to detect when water is around.

Fig. Ultra sonic sensor

5) Esp8266 wifi module :The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network.

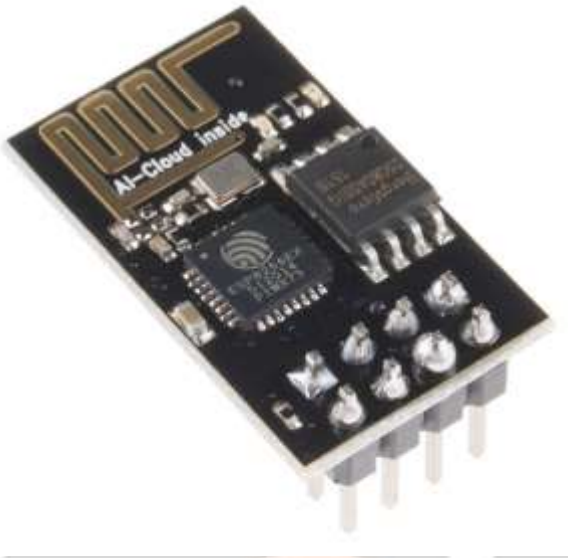


Fig. Esp8266 wifi module

6) Buzzer :A buzzer or beeper is an audio signaling device,[1] which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Fig. Buzzer

EXPECTED RESULT

Case 1:

At normal water level when calibration is done, the station 1 and station 2 indicates a green LED glows and the red LED will also glow for indicating the station is ON. On server

station first System LED will glow indicating server station is ON and second or third or both Led will glow to show whether station 1 or station 2 or both stations are ON. Here the Alert LED is Off because the water level is normal. The following figure shows results on the server station.

Case 2:

At dangerous water level, there are three cases when station 1 is at a dangerous water level and when station 2 is at a

dangerous water level and the last one is when both stations are at a dangerous level. The server station shows System,

Station 1 and Alert LED will glow when station 1 is at flood condition and when System, Station 2 and Alert LED will

glow if station 2 is at flood level. When server station shows System, Station 1, Station 2 and Alert LED will glow then it indicates both stations are at flood level. On Android Application when there is an alert condition then the alert message will display. The Android Application works on mobile message. When mobile gets the message of FLOOD then application shows "FLOOD IS COMING, RUN RUN". And during this, mobile gets vibrated and it sounds the alert alarm.

Fig. 16 Alert on Android Application

CONCLUSION

The "Implementation of Early Flood Detection and Avoidance Alert System Based on IoT Android Application" is a valuable tool for detecting floods at an early stage and providing timely alerts to people in flood-prone areas. The proposed system uses IoT sensors to collect data on water levels, weather conditions, and other parameters, which are then processed and analyzed to identify potential flood situations. An Android application is developed to provide real-time alerts to users, enabling them to take necessary precautions and avoid dangerous situations.

The system can help minimize the loss of life and property caused by floods, making it a valuable tool for disaster management. It can be used by individuals, communities, and local authorities to better prepare for floods and manage their impact. The proposed system is an example of how technology can be used to address the challenges of natural disasters and improve the resilience of communities.

In conclusion, the "Implementation of Early Flood Detection and Avoidance Alert System Based on IoT Android Application" has the potential to save lives, protect property, and provide valuable information to local authorities. The system can be further improved and expanded to include additional sensors, advanced analytics, and real-time data sharing with emergency response teams, making it an even more effective tool for flood management.

REFERANCES

[1] D. A. Bagade, "Real time decision support system: Maharashtra." Unpublished.

[2] D. Pandit, G. Jorgensen, A. Klinting, and F. Hansen, "Real time streamflow forecasting and reservoir operation system for krishna and bhima river basins in maharashtra (rtsf and ros)," Hydrology Project II 63800247, Government of Maharashtra Water Resources Department, 2013.

[3] B. Kang, S. Park, T. Lee, and S. Park, "Iot-based monitoring system using tri-level context making model for smart home services," in Consumer Electronics (ICCE), 2015 IEEE International Conference on, pp. 198–199, Jan 2015.

[4] M. Wang, G. Zhang, C. Zhang, J. Zhang, and C. Li, "An iot-based appliance control system for smart homes," in Intelligent Control and Information Processing (ICICIP), 2013 Fourth International Conference on, pp. 744–747, June 2013.

[5] H. Li and X. Xing, "Internet of things service architecture and method for realizing internet of things service," Mar. 6 2013. EP Patent App. EP20,110,774,309.

[6] K. Ashton, "That 'internet of things' thing," RFID Journal, no. 4986, 2009