

Smart Water Level Monitoring and Prevention Using IOT

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ABSTRACT

Flood is a common problem not only in India but worldwide and most of the water bodies are easily accessible to common people. At times it may happen that the weather conditions may change suddenly and the water bodies may become violent, resulting in a flood which can lead to loss of lives as well as livestock. Therefore, a rapid flood detection system that can reach a wide area such as the internet is necessary to minimize the effect sof disasters. So, this paper proposes a flood detection system with the help of the Internet of Things (IoT).DHT-11 Digital Temperature and Humidity Sensor. Then we have the Water Flow sensor to check the flow of water. And lastly, to measure the distance and water level we have HC-SR04-Ultrasonic Range Finder and Distance Sensor. Finally, the collected information is transmitted to LCD to display the information

KEYWORDS-

Flood detection, Arduino nano, IOT,

Realtime, Sensors, DHT11,

HC-SR04, Buzzer[3], Display.

I. INTRODUCTION

"IoT Early Flood Detection & Avoidance System"[3] is an intelligent system which keeps close watch over various natural factors to predict a flood, so we can embrace ourselves for caution, to minimize the damage caused by the flood. To eliminate or lessen the impacts of the flood, the system uses various natural factors to detect flood. The system has a Wi-Fi connectivity, thus its collected data can be accessed from anywhere quite easily using IoT.

To detect a flood the system observes various natural factors, which

includes humidity, temperature, and water level and flow level. For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor.

It is a advanced sensor module with consists of resistive humidity and temperature detection components. The water level is always under observation by a float sensor, which work by opening and closing circuits (dry contacts) as water levels rise and fall. The system also consists of a HC-SR04 Ultrasonic Range Finder Distance Sensor. The Ultrasonic sensor works on the principle of SONAR and is designed to measure the distance using ultrasonic wave to determine the distance of an object from the sensor. All the sensors are connected to Arduino UNO, which processes and saves data. The system has Wi-Fi feature, which is useful to access the system and its data over I

II. PROBLEM STATEMENT

Water management is a critical issue in both urban and rural areas. Traditional water level monitoring methods are often inefficient, labor-intensive, and lack real-time monitoring capabilities, leading to issues such as water wastage, tank overflow, and water shortages. The integration of the Internet of Things (IoT) can enable remote monitoring, predictive analytics, and automated control of water levels in reservoirs, tanks, and floodprone regions.

III. METHODOLOGY

The implementation of a Smart Water Level Monitoring[1] and Prevention System using IoT follows a systematic approach that includes hardware Integration,data transmission, and automated control.This IoT-driven Smart Water Level Monitoring System [2]enhances water conservation, prevents

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resource wastage, and provides real-time monitoring with automation, ensuring sustainability and disaster prevention.

IV. BLOCK DIAGRAM



Fig: Block Diagram

V. COMPONENTS USED

1. **ARDUINO UNO**

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worring too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again."Uno" means one in Italian and was chosen to mark the release of Arduino Software [7](IDE) 1.0. The Uno board and version 1.0 of Arduino Software [7](IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.



2. ULTRASONIC SENSOR

Ultrasonic sensors are widely used in robotics, automation, and security systems for distance measurement. They use sound waves to determine the distance between the sensor and an object. The most common ultrasonic sensor used with Arduino is the HC-SR04.



Fig: ULTRASINIC SENSOR.

3.DHT11HUMIDITY SENSOR

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor[5] and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). It's fairly simple to use, but requires careful timing to grab data. The only real downside of this sensor is you can only get new data from it once every 2 seconds

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Fig:DHT11HUMIDITSENSOR

4.BUZZER

A **buzzer** or **beeper** is an <u>audio</u> signaling device, which may be <u>mechanical</u>, <u>electromechanical</u>, or <u>electronic</u>. Typical uses of buzzers and beepers include <u>alarms</u>, <u>timers</u> and confirmation of user input such as a mouse click or keystroke.



Fig: BUZZER

RESULT: -



Flood Detection System[6] tries to help all kinds of people to be aware of the damages that could harm them. Be it

related to farming, industries, or even normal residents; this system is trying to alert everyone. Since this natural phenomenon is uncalled for, we have to take precautions for our betterment. This proposed approach aims at monitoring the water leve[1]l in a particular water body. In the future, it may be amplified to monitor multiple locations at the same time and the web page must be able to display the knowledge supported by the choice done by the authority.

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