



Water Level Meter for Alerting Population about Floods

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ABSTRACT: Flooding is one of the major disasters occurring in various parts of the world. The model is very much useful to monitor the water level variations in rivers, dams, reservoirs and the monitored values regularly stored in the web server which is useful to send flood alerts to corresponding authority for proper action and the same can be viewed through the web. This research investigates the use of wireless sensor network for monitoring of river and floods conditions. The wireless sensor network system can also be used for real time monitoring of water conditions like water flow level and precipitation levels. The model was developed and engaged in monitoring flood.

KEYWORDS: ESP8266, Sensors, Thing speak cloud, LED's, Internet of things(IoT), Embedded C.

I. INTRODUCTION

Recently flood hit a many parts of India which responsible for immense and major loss of life and property damage. At present in India the flood situation is monitoring by observing water level of major dam and rivers in country which worked on manual basis. We need to improve the present system with the help of sensors in dam and rivers which give measurement values related water level. For this purpose we design a system for people who live in low lying areas and suffer the damage because of flood.

Nowadays floods become the dangerous natural disaster. It is having enough destructive power to swipe away and destroy whatever comes in their path. So my aim is to detect the occurrence of floods and alert the people. So that everyone can be safe.

There is a siren to indicate the severity of situation. Buzzer indicates that water level in the river reaching its maximum level, so everyone should leave that place. Siren will be activated when the river reaches its maximum position and ready to overflow. So people can understand the situation and escape from the place. There will be a website which is specially designed to show the status of water level in the rivers.

The rules are very important to do the project before doing the project first we take the permission from the government. The flood exist several types of natural disasters.

It is one of the most dangerous. We must take into account the water level system protection. It must have a waterproof coating to avoid get damaged. When water exceeds the maximum level and sensors get dirty due to high solids in the water, hence a measurement is recommended in a controlled environment [1].

It is convenient to use an automatic level measurement and wireless data transmission connect the device to a server.

II. LITERATURE SURVEY

Application of Internet of Things in Urban Flooding Prevention Management System

The Survey has analyzed the security architecture and security requirement of IOT technology. The paper the demand of urban waterlogging prevention management system with the help of IOT. The basic model urban waterlogging prevention has described in this article [1]. The automated river level monitoring network has several (Node 1, Node 2, Node N) which are river side points where the data acquisition systems are installed. These embedded systems are designed to operate without direct human supervision. These acquisition systems collect and store raw data and transmit them through GSM interfaces. The data are sent through the GSM network to a remote server which is the Central Monitoring Unit (CMU) that collects data from all the active nodes [4]. This monitoring



system contains a database that processes the raw data and extracts information based on natural criteria and estimates critical parameters. These obtained parameters are refreshed periodically and updated as soon as new raw data are received from the connected nodes[5].

Urban flooding in recent decades in mega cities of India

People are migrating from rural to urban area due to unemployment and other reasons. The population count is increasing day by day and due to that cities are facing many new challenges. Flooding condition is one of the big challenges increased due to uncontrolled growth of mega cities. The article describe the population count and death rate due to flooding in four mega cities in India[2].

The real intent of the proposal is to achieve a flood early warning system. This micro-model can be developed based on a programmable electronic board (NODEMCU 8266). An electronic circuit that is located at a specific height above a water container. When the water level rises for different height, the information is transmitted to web server via WiFi. After this information can be accessed by mobile devices, users can graphically see the data, these data show the values of water levels. We can get to know the amount of water level and at which level it becomes dangerous. We can consider warning system to alert residents at low-lying areas about changes in the level of water. Safe level of water can be predicted in future to save life's [3].

Existing system refers to the system is to develop a local real-time river flood monitoring and warning system for the selected communities near river. Currently there exist anIoT based water monitoring system that measure water level in real time. The prototype is based on idea that the level of water can be very important parameter when it comes to the flood occurrences especially in disaster prone area. A water level sensor is used to detect the desired parameter and if the water level reaches the parameter the signal will be freed in real time to social network like Twitter[2].

In[2] this proposed system we are using ESP8266 for giving information to others and we are using internet. We note that the thresholds are defined by the user based on prior knowledge and experience with the floods. Different thresholds are defined for units positioned at different places of the flooding area. Now, as the water levels increases the air in the gap compresses resulting a change in the pressure. The pressure sensor is placed inside facing the trapped air, senses the pressure of the air and converts it into voltage. Since the voltage output of the sensor is in analogue an analogue to digital conversion is required for the calculation which is done by the microprocessor. Once the water level rises to the threshold level the system will send emergency notification to all pre determined participants and activate the siren. LCD is used to display the water level.

Upon receiving the notification DISMAC (Digital scene matching area correlation sensor) can quickly open up the emigration centers and carry out the necessary steps to facilitate the emigration process alert other authorities (police, military, fire department, etc) and secure properties, and also all the data will be store in the Thing speak cloud and users can monitor date each and every minute.

III. PROPOSED METHOD

This node is the independent flood monitoring node equipped with necessary sensors and connectivity modules. It has three major stages, including sensors, controller, Wi-Fi interface to upload the information on server. Data from various sensors are collected by the ESP and is then computed and uploaded on the server. The data uploaded on server is stored on the database. The stored data is then routed to the front end web applications and mobile applications[4].

IV. EXPERIMENTAL DATA AND RESULTS

In this project, some hardware is used that are Microcontroller, sensors, components required for power supply. The Hardware collects the water level, Pressure of water, Rainfall measure to detect the levels of the flood. The hardware consists of Wi-Fi enabled controller which connects to the server and allows sharing the data to through internet.

In this module, we have done an android application as well as the Website application for this project. Admin web page will contain and display the information like Login, Registration, Number of users registered to the app, status of the sensor, safe places near flood affected area where people can migrate and that places are shown on the Map. The Android application will be used by the users who are register. After registration the user can login with an unique username and password. And then user can access all facilities provided by application. Application is provided the information like current status of water level and temperature etc. This app contain map which are show the safe places near the user and also the current place where the user is. Here we using a language Embedded C

1. **Microcontroller**- This does the controlling with processing .Microcontroller will take the information from the sensor .This information will sent to the admin through the database.



2. **Sensors**-This will collect the information from the particular nodes which are located at certain site. There are four sensors we are going to use in this project. They are as follows:

Water level measurement: This sensor is used to measure the water level height. For that we are going to use Ultrasonic sensor which emits short, high frequency sound pulses at regular intervals. If they strike an object, then they are reflected back as echo signals to the sensors.

3. **Power Supply**- In real time we get 230v AC, in actual project we do not need this amount of power supply so we convert this AC power supply to DC power supply.

4. **ESP8266**- The ESP8266 Wi-Fi modules a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

5. **Thing speak cloud**- Thing Speak is an Internet of Things (IoT) platform that lets you collect and store sensor data in the cloud and develop IoT applications. The ThingSpeakIoT platform provides apps that let you analyze and visualize your data.

V. SYSTEM DESIGN

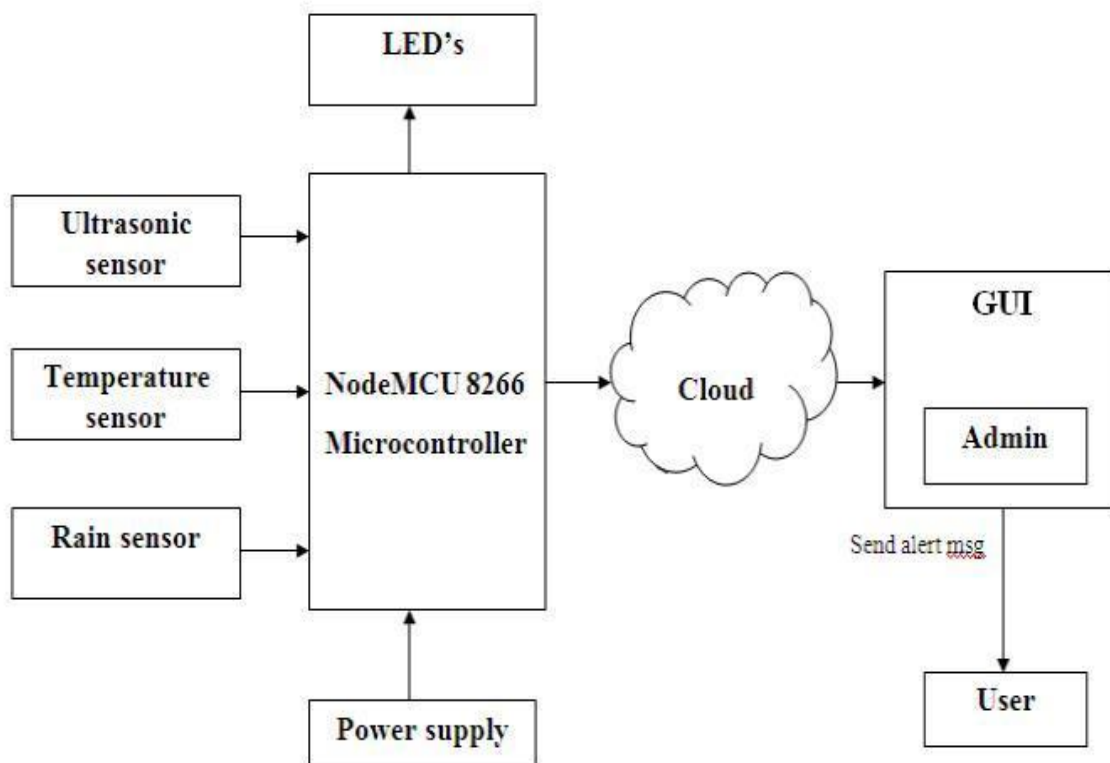


Fig 1: Block diagram

The proposed design for this framework is given above in fig 1. It demonstrates the way this framework is composed and brief working of the framework. To begin with it brings water-level Values from the sensors (ultra-sonic, rain, temperature) and it is put away in cloud (thingspeak). At that point, contingent on the water-level esteems (low, medium, high) in the event that it is Low then it is green, medium is yellow and High is Red. In the event that red means at that point ready messages will sent to every enrolled client.

ESP8266

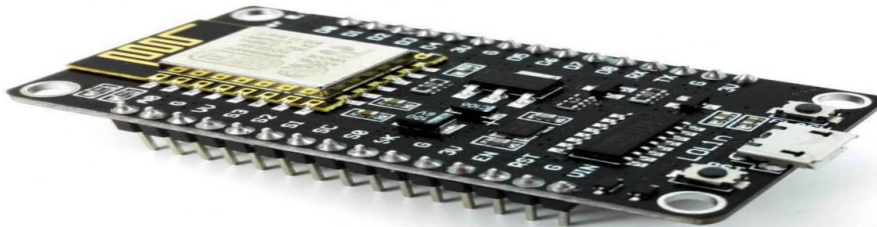


Fig 2: ESP8266

The ESP8266 Wi-Fi modules a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Rain sensor

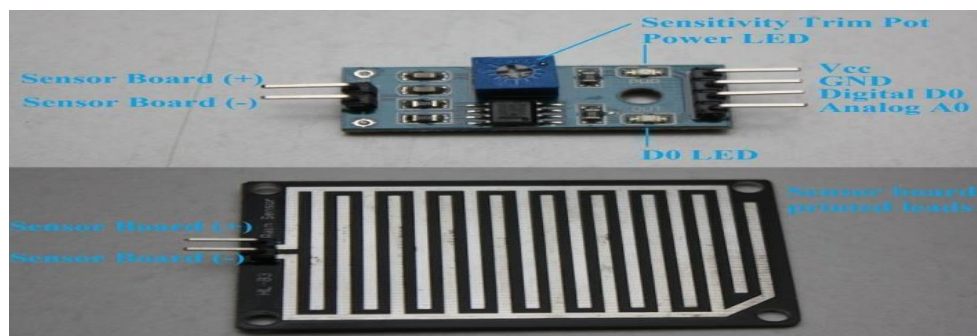


Fig 3: Rain sensor

Rain sensors are utilized as a part of the detection of water past what a dampness sensor can identify. The rain sensor Fig 3 identifies water that finishes the circuits on its sensor sheets' printed leads. The sensor board goes about as a variable resistor that will change from 100k ohms when wet to 2M ohms when dry. The wetter the board the more present that will be led.

Ultrasonic sensor

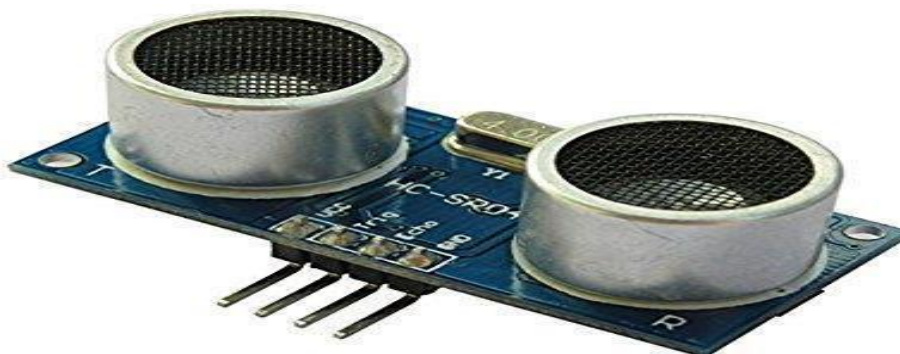


Fig 4: Ultrasonic sensor

A Ultrasonic sensor is a gadget that can quantify the separation to a protest by utilizing sound waves. It allots remove by sending a sound wave at a particular recurrence and tuning in for that sound wave to skip back. Fig 4, By



recording the slipped by time between the sound wave being created and the sound wave bobbing back, it is conceivable to ascertain the separation between the sonar sensor and the protest.

Temperature sensor



Fig 5: Temperature sensor

A temperature sensor is a gadget, as appeared in Fig. 5 regularly, a thermocouple or RTD, which accommodates temperature estimation through an electrical flag. A thermocouple (T/C) is produced using two disparate metals that create electrical voltage in guide extent to changes in temperature.

VI. CONCLUSION

The water level monitoring system based on Internet of things (IoT) is more advantageous other existing system to observing water level and warning. It is automatic technology which replacing solution for manual system. For further move with the help of gateway a device would develop sound system for announcement in low level area before an during the flood.

This internet of things(IoT) based water monitoring system that measures water leveling realtime. A water level sensor is used to detect the desired level and if the water level reaches the specific level data will be sending to cloud server. A cloud server will be configured as data repository. Alerts and relevant data will be transmitted over the internet to a cloud server and trigger notifications and announcement on speaker near flood prone area.

This is very helpful for people not having access to modern devices such as smartphone,television,radios etc. For alert messages or real time information. We will have historical data on server,so that we can use this for future references and take necessary precautions or actions.

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