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Flood monitoring and alerting system using IoT

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ABSTRACT

Flooding is one of the major prevalent disaster occurring in various parts of the world. Flooding is among the major countries which occur in all places of the world and results in a massive quantity of damage to the environment. The problem occurs in a flash flood where the peoples may not have time to relocate their important things from the affected area to the safest area. As such, there is a need to develop a technology for monitoring and alerting the flood is necessary to our human kind.

Keywords: Flood monitoring, Arduino uno R3, Sensors, monitor.

INTRODUCTON

Flooding is one of the major problem in India. Major floods are occur in Uttarakhand, Tamilnadu, Kerala, Bihar, and Hyderabad. According to RBA the average annual damages caused by flood in our country in between 1953–2018. Monetary damages–5695 Cr, Houses damaged–1.2m, loss of life–2009 and loss of cattle life – 618248. In our proposed system the main hardware Arduino UNO is connected to the different sensors to check the current level of flood. This system not only monitor the level of flood but also alert the people and the government to minimize the impacts of food. This system is divided into three stages. They are Green alert, Orange alert, and Red alert. If the water is above 75% it indicates the orange alert and if the water level reaches 85% it indicates the red alert. It alerts the people using message, mail and also speaker various sources provided for alerting the people and the government.

RELATED WORK

The development of flood risk reduction, the difficult role is to first understand the hazardous phenomenon and the highly dangerous threats on the society. The IoT based systems are preferred by developers because it collect the data from different sensors without human interference. These systems are combined with water level sensors, ultrasonic for water level detection, water flow sensor for measuring water flow but the major drawback is that

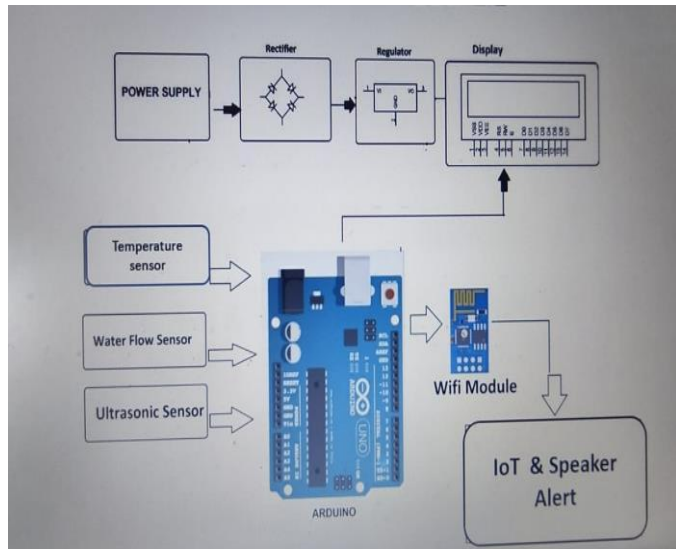
it alert system. Pressure sensors were used to get water level measurements and at each second so that accuracy has been increased. The trend in that shows the usage of mobile phones is very common and almost 80% of the audience holds a smart phone. So this system not only alerts the people but also monitors the flood alerting system.

FLOOD ALERTING SYSTEM USING ARDUINO

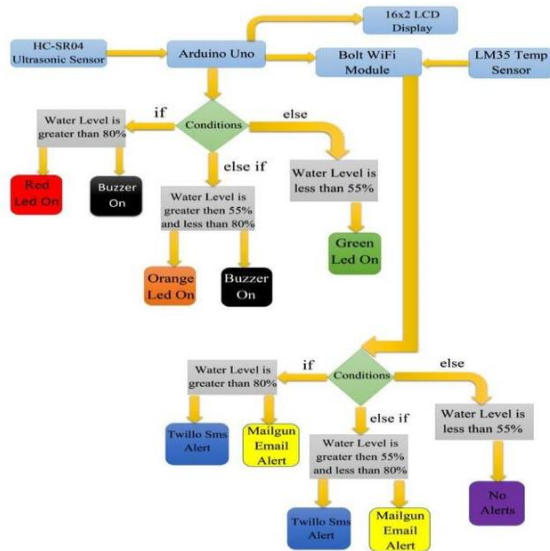
In both developing and non developing countries, flood is the primary disaster that causes loss of human and animal life and also for property. Flood due to earthquakes in oceans, rainfall and other natural disasters occur simultaneously in many parts of the world in every year. During flood many lives, property and many things are get damaged. If we have any system which can give us early alert regarding flood and its damage then we can able to save lot of lives. If a system which uses technology to detect the flood level before we can able to save and evacuate lot of humans and animals and their property. So in this project we brings a prototype which can be used to detect water level in dam or reservoir and then send a alert using message, mail and buzzer. In this prototype we are going to use an Arduino UNO, ultrasonic sensor, buzzer, LCD, water flow sensor, PCB board and some connecting wires.

**PROPOSED SYSTEM
SYSTEM OVERVIEW**

We have proposed a system that warns the public and government about the current level of the flood and also alert the people. With the help of the IoT platform, real time data will be available to the people instead of depending on the government for monitoring the situation. With the help of the proposed system, alert will be provided when values reach a threshold be pending on



the region. The idea is to develop a device which is going to save people, economy, society, lives and their habitat. Using various sensors will increase the precision. Keeping that factor in mind, we are creating a device which a user need to register their mail id and their phone number in our specified website. If they register the alert will be directly notified to their mobile number and their mail id, they can also able to monitor the system using thing speak IoT plat form.



OBJECTIVE

The main objective of the project is to develop a hardware that alerts and rescues the people who are living the areas where the reservoirs and dams are located.

- To design a circuit and program the circuit that alerts the people
- To apply the data in IoT and that monitors and alerts the people.
- To detect the current level of flood in the reservoirs

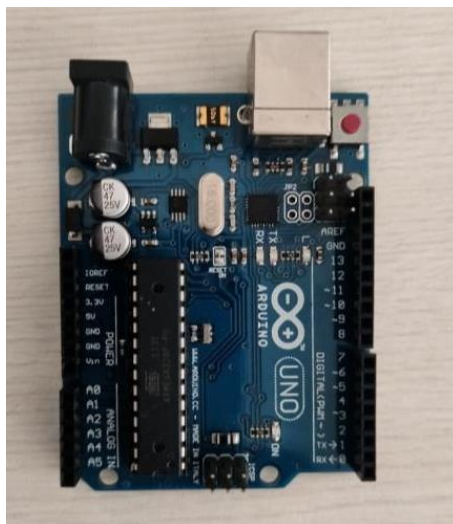
with help of sensors and gives alert.

- To warn the people who are living near the water reservoirs areas

HARDWARE REQUIREMENTS

In this project some hardware devices are used such Arduino uno, Bolt Wi Fi module to gather the data in the cloud, temperature sensor, ultrasonic sensor, water flow sensor, LCD display, LED light and Buzzer .

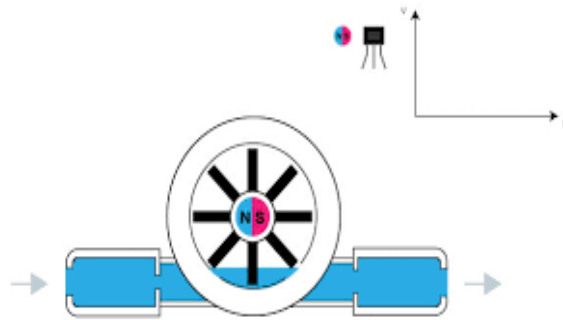
ARDUINO UNO



The Arduino UNO is the standard board of Arduino. The Arduino IDE is the software used to program in the

Arduino board. C and C++ are used to program in Arduino board. Here UNO represent 'one' in Italian. It was named

WATER FLOW SENSOR



Water flow sensor consists of a plastic valve from which it allows water to pass. A water rotor with a hall effect sensor is present the sense and it also measure the water flow. When water flows through the valve it was rotates the rotor. In this, the change can be observed in speed of the motor. This change comes as a pulse signal by the hall effect sensor. The rate of flow of the water can be measured. According to this principle, this sensor, voltage difference

is induced in conductor due to the rotation of the rotor. When the moving fan is rotated due to the flow of the water, it rotates rotor which induces the voltage. The induced voltage is measured by hall effect sensor and displayed on the display. The water flow sensor can be used in hot waters, cold waters, warm waters and dirty water also these sensors are available in the different diameters and with different flow rate ranges.

BOLT WIFI MODULE



The Bolt IoT Platform is consists of three major things:

1. Bolt WiFi module
2. Bolt Cloud
3. Bolt Mobile App

The Bolt Wifi board, has a single analog input that can be used to hook up a sensor. Data collected from this sensor and is not only used to store for you in Bolt's cloud they can even transmits the data into graphs and also can able to send alerts.

LIQUID CRYSTAL DISPLAY

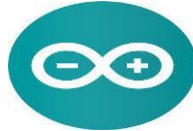


LCD is a type of flat panel display which used liquid crystals its primary form of operation. LEDs have large set of use cases for consumers, as they can be commonly found in the smart phones, televisions, computer monitors and instrument.

SOFTWARE USED

- Arduino IDLE
- Python IDLE
- Twilio
- Mailgun
- Bolt Cloud

ARDUINO COMPILER



The Arduino IDLE is a compiler that is used to program the Arduino board for all version board of the Arduino and also in the microcontroller

The language used to code in Arduino compiler is C and C++ and it has own GCC compiler

PYTHON IDLE



Python IDLE is a software used to write and also execute the python programs with a standard library. IDLE–Integrated Development and Learning Environment. It has many features like GUI toolkit, cross platform, works same on windows, Linux, Unix and macOS.

TWILIO



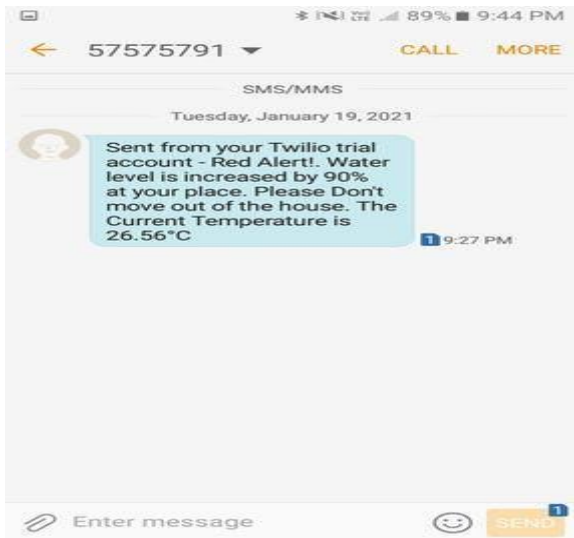
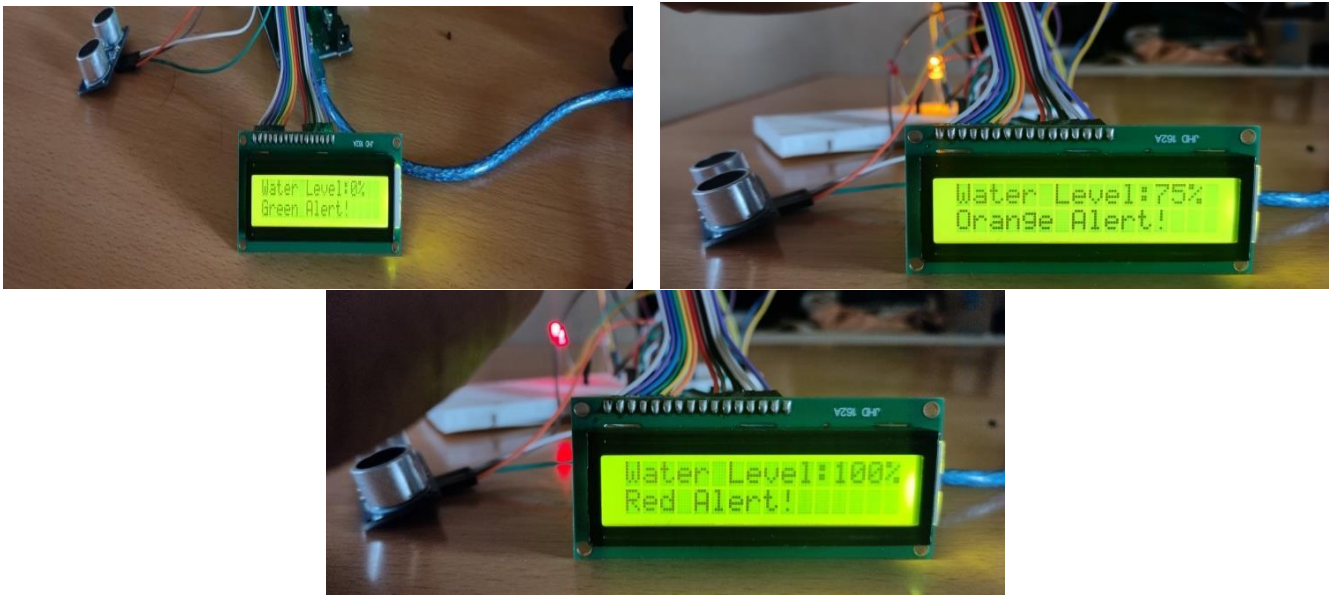
Twilio is a API software that is used for messaging and voice improve sales. It is a leading software mostly used for real time messaging service and notifications. We can also connect Twilio API with whatsapp.

MAILGUN



Mailgun used to tag e-mail template used for alerting messages for real time analytics. It is a SMTM service provider used for free.

OUTPUT



CONCLUSION

This project analyses and highlight an alert that will save us from the risk of flood. It has great accuracy and alert the people on the time. Using this type of products in flood affected areas minimize the risk of flood and irt reduces the work of the government. Nowadays the (IoT) is broadly

used in worldwide, this will display the data of water level measured on LCD display. This project can be very useful to the Meteorological Department to continuously monitor the dams and river water level. With this project it can save many people lives by alerting when the water level increases beyond the limit.

REFERENCES

1. Anusha N, Meghana D, Apoorva K. Autonomous flood alerting system. IJERT. 2020:2278-0181. Available from: <https://www.academia.edu/download/64225773/autonomous-flood-alerting-system-IJERTCONV8IS13008.pdf>
2. Satria D, Yana S, Munadi R, Syahreza S. Prototype of google maps-based flood monitoring system using arduino and gsm module. Int. Res. J. Eng. Technol. 2017 Oct;4(10):1044-7. <https://www.academia.edu/download/54946490/IRJET-V4I10188.pdf>
3. Simatupang JW, Naufal F. Flood Early Warning Detection System Prototype Based on IoT Network. Internetworking Indonesia Journal. 2019 May; 11(1):17-22..
4. Hassan WH, Jidin AZ, Aziz SA, Rahim N. Flood disaster indicator of water level monitoring system. International Journal of Electrical and Computer Engineering. 2019 Jun 1;9(3):1694.
5. Mr. Singh A, Ms. Bha O. Flood early detection and avoidance by IOT. IJERT. July 2020.

6. Shah WM, Arif F, Shahrin AA, Hassan A. The implementation of an IoT-based flood alert system. International journal of advanced computer science and applications. 2018;9(11). <https://pdfs.semanticscholar.org/77e6/1942964a03e33f7bb5304ae750bed8ed01d3.pdf>
7. Marathe AR, Patil PK. Flood Monitoring and Alerting System based on IO. IJARIE. 2021.
8. Talari P, Venkatasubramanian VR, Vedhanarayanan S. Integrated Automatic Flood Warning and Alert System Using Internet of Things. Design Engineering. 2021 Nov 22:14478-87.
9. Reddy MS. Flood Detection and Avoidance System using IoT. Turkish Journal of Computer and Mathematics Education (TURCOMAT). 2021 Apr 24;12(9):152-8. <https://turcomat.org/index.php/turkbilmac/article/view/2962>
10. Dhaya R, Kanthavel R. Insight of Iot-based sensors for flood monitoring techniques. IJSTR. 2021.