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# Flood Detection System Based On IOT

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## Abstract

Floods are basic catastrophic events that allows extreme desolation of any nation. They are typically brought about by precipitation and overflow of waterways, especially during heavy stormy season.In order to detect and avoid floods in timely manner, technology plays a very important role. With the help of the cureent technology priviliges, we can detect and prepare ourselves for an upcoming disaster. This project aims to monitor the flood condition and send alert if there is an occurrence of risk through IOT. The measurement of rising water level is done to detect the flood. The system uses three sensors to detect temperature, humidity and water levels at every stage. This model gives a warning after the water level rises to a particular height. This model can be used to greatly reduce the casualities in a devastating event of flood.

In our project explains the working of different types of components, sensors (how to sense the atmosphere, and environmental situations). The best part of our project is we uses here IOT based system. IOT (The Internet of things) that easily connect to internet (it connect the devices within a network environment) allows control as well as receives the data about smartphones or computers. IOT based system increase the efficiency & productivity of components. Here we can easily detect, or access the data through mobile platform.

## • Introduction

Natural calamities happens everywhere in the world, and which affects the human life and economy of the country. Economy and growth of any country depends upon the agriculture, hence the proper alert makes the farmers vigilant to protect the crop from flood.
The increasing carbon footprints and greenhouse gases have severly led to an imbalance and disturbance in the natural cycle of rains and floods Hence we are facing the danger of unwarned and inevitable floods more than even before.

Acoording to the India Meteorological Department(IMD), there was 2346.3 mm of precipitation, instead of average 1694.55mm.

Kerala received over two and a half times more rainfall August's average. Between August 1 and 19, the State received 758.6mm of precipitation, compared to the average of 287.6mm , or 164% more. This was 42% more than during the entire monsoon season.
The unprecedented rainfall was caused by a spell of low pressure over the region. As a result, there was a perfect confluence of the south-west monsoon wind system ands the low pressure systems formed over the Bay of Bengal and Odisha . The low pressure regions pull in the moist south-west monsoon winds , increasing their speeds , as trhey then hit the western ghats , travel skywards, and form rain -bearing clouds.
The overall effect of this calamity is that it killed more than 410 million people since June 2018 in what local officials said was the worst flooding in 100 years . Many of those who died had been crushed under debris caudsed by landslides . More than 1 million people were left homeless in the 3,200 emergency relief camus set up in the area .
Parts of Kerala's commercial capital, Cochin , were underwater, snarling up roads and leaving railways across the state impassable . In addition, the state's airport, which domestic and overseas tourists use, wqas close, causing significant disruption.

This is where the Internet of Things(IoT) proves to be a very efficient approach. IoT basically refers to tne wireless network between objects embedded with some electonics, software and sensors with the internet, enabling them to collect and exchange data, and can be remotely monitored and controlled.

An IoT early flood detection and alert system using Arduino is thus, a proposed solution to this problem. The system consist of various sensors which are temprature, humidity, water level, flow and ultrasonic sensors, and also includes an Arduino controller, a Wi-Fi module, an LCD, an IoT remote server- based platform and the android application with constructed user friendly GUI relaying all the vital imformation involved in the picture in a visual format.

Flood predictions and information like;
i) It will predict water level rises along with the speed , it will send an alert immediately.
ii) It will measures the intensity of rainfall , which is the height of the water layer covering the ground in a period of time.
iii) It will monitor the temperature as well as humidity of the regions at a particular time.

In this system , to detect flood the system observes various natural factors , which includes temperature, humidity, water level and flow level. To collect data of mentioned natural factors the system consists of different sensors such as humidity and temperature sensor, ultrasonic sensor, water flow sensor which collects data for individual parameters. All the sensors are related to Arduino UNO, which processes and saves data.

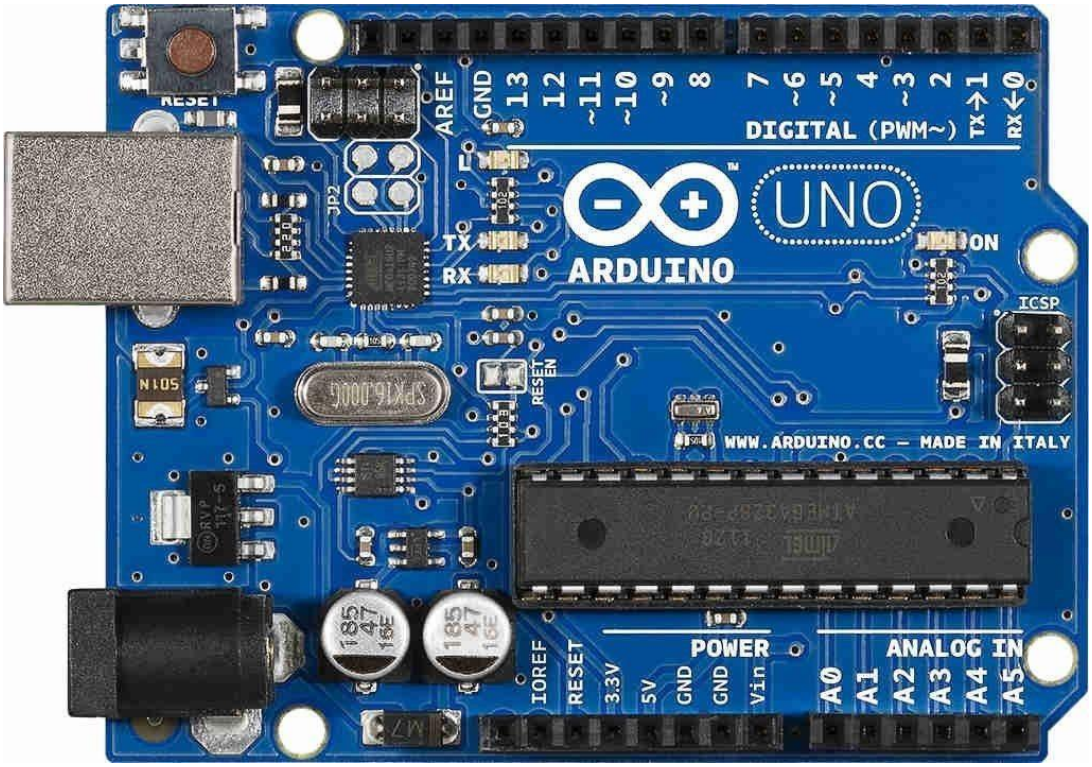
- **Implementation Method**

The main idea in our project to develop the design of accurate smart flood detection system using sensors and IOT thus the system efficiency can be increased and can be imposed as the real time detection system. In this paper the main objectives are to implement a system which covers various sensors, network components, IOT and web applications for detecting the floods and sendindg an alert to the various organisations.

Here we can easily detected weather conditions, humidity, water levels in mud, drought, tanks, river, dam , and in streams, and flow level. we use different sensors for monitoring and controlling varierities of parameters which are mention in the below -

**The Hardware Implementation (used in our projects are)**

**i) ARDUINO UNO**



**ii) POWER SUPPLY**

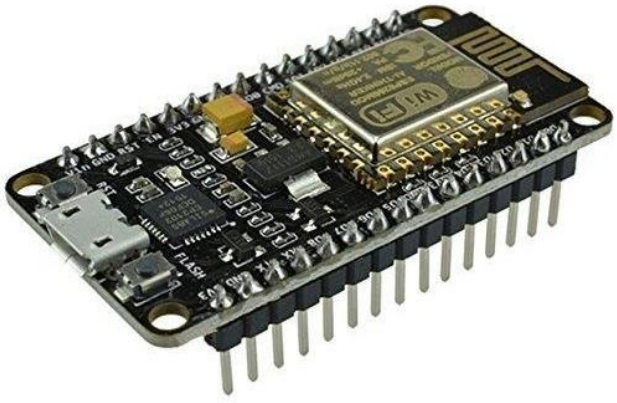
**iii) GPS**

**iv) ULTRASONIC SENSOR**


**v) RAIN SENSOR**

**vi) BUZZER**

**vii) ESP8266**



**viii) IOT**

**i) ARDUINO UNO**

It is based on microcontroller, or an open source electronics platform. Which is easy to use as board, the boards consists of digital analog Input/Outout pins, shields, and other circuits. In this project it connects to the all sensors and which processes and saves data, where we collect and upload all the data obtain by the different sensors.

**ii) POWER SUPPLY**

A power supply is an electrical device that supplies electric power to an electrical load All Arduino boards need electrical power to function. It supplies power to all sensors through the Arduino.

**iii) GPS**

It stand as global positioning system it is used here to easily located the places for any alert messages. GPS have properties like ; determinig a postion, getting from one location to another (Navigation), monitoring objects, mapping, timing (time measurements)

**iv) ULTRASONIC SENSOR**

It is an electronic device used for detection of objects (solid, liquid etc.) and that also measures the distance of target objects and uses for sound waves. when the system senses water wave and level of water that is protect from that present condition, and after detection system beep the alarm.

**v) RAIN SENSOR**

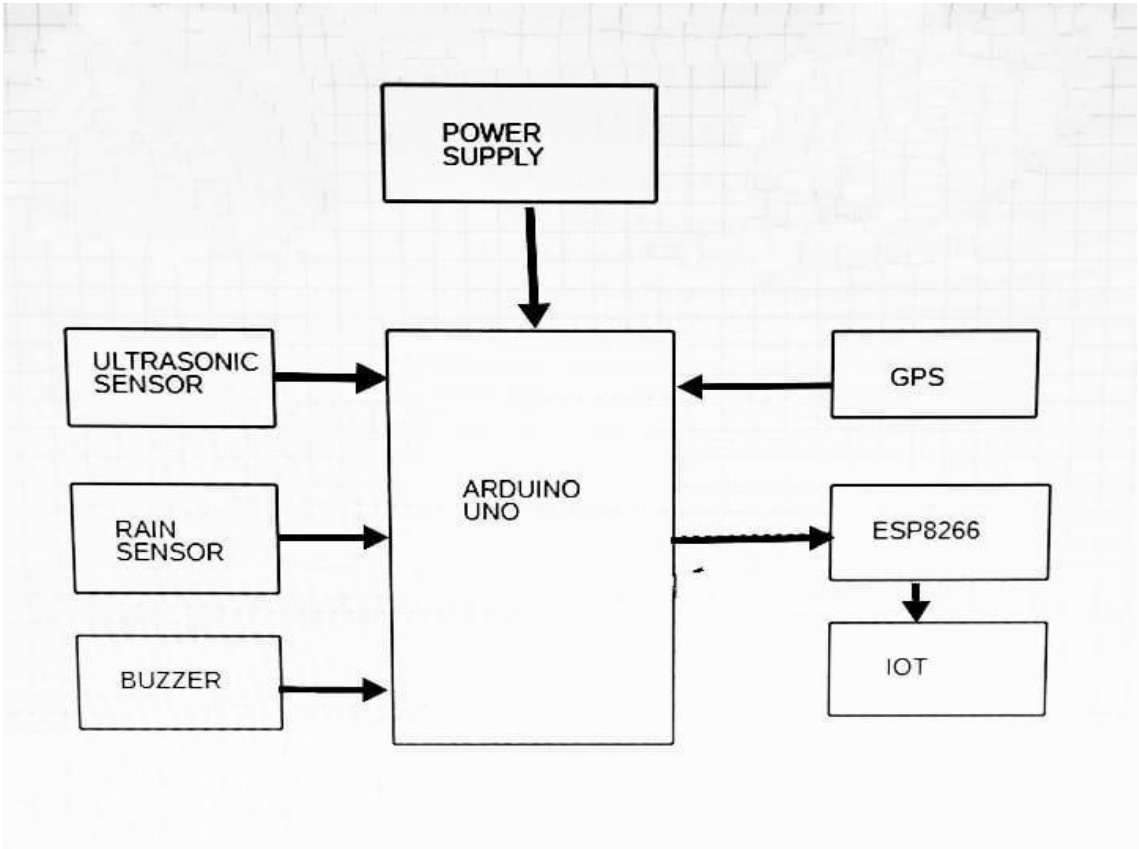
Rain sensor make prefect sense for the most irrigation system or it detect the water drops or rainfall, when rainfall increases the alert system get activated.

**vi) BUZZER**

Buzzer is type of alarm system, or type of sound device that coverted audio signals into sound signals. It include devices like alarm, timer. In our project its play very important role to detect any fault or sensors activities it start beeping.

**vii) ESP8266**

It is a low cost wifi module, by using it we easily connect to micro controller with any wifi networks, and micro controller easily communicate to any micro controller. It receive data from a website and also set any form of data to any website, with built-in TCP/IP networking software, and microcontroller capability and it attach to IOT.




Where all the sensors are connected to the ARDUINO UNO which processes and saves data, where we collect and upload all the data obtain by the different sensors. It operates all of them in synchronized way or manner. ULTRASONIC SENSOR checks the water level and flow of water level in the dam or river, if the water level raised then send a notification using IOT. RAIN SENSOR detect the rain. IOT will be use to display output or displays the result at the webpage. GPS used for detect the location easily, it to fetch location and update the flood location. BUZZER checks the alarm signal and for any abnormal condition or any fault detection it will give alert message. ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability and it attach to IOT.

**The Software Implementation**

i) ARDUINO IDE to develop instructions to be executed by the controller.
ii) EMBEDDED C its programming language used for micro controller.

All the process of hardware, and features provided by the software can be easily checks and monitor the system. It help to the system run smoothly. And all the processes have same purpose to achieve the successful working of the system.

## • Conclusions

Flood warning is the provision of advance warning of conditions that are likely to cause flooding to property and a potential risk to life. The main purpose of flood warning is to save life by allowing people, support and emergency services time to prepare for flooding. The secondary purpose is to reduce the effects and damage of flooding.Our results show that the we can checks and easily detect the water level with the help of various sensors. Through this paper we have tried to propose a potential and economic solution to the problem of floods. In earlier floods cannot be predictated eaily, but now a days we have a , lot of resourses, technologies and various different types of sensors, so we can easily detected or predicted or atleast we can tried for achieve the solutions for any economic and environmental problems. In this paper we are trying to develop a process which helps us to know the flood detection and intimates us to know the necessary precautions. The flood detection system using IOT based send a alert message or beeps the sound may it save the lives of people by reducing the human quick out during emergency situations. The system has a Wi-Fi connectivity, thus it's collected the data can be accessed from anywhere quite easily using IOT. It is timely detection of possible flood risks and floods, Highly reliable and available real-time data. Tailored solution that can be integrated with external developments at any level (devices, connectivity, cloud or user application.

## • References

[1]. Flood early warning system - A warning mechanism for mitigating disasters during flood". By department of administrative reforms & public grievances minister of personnel, public grievances & pensions Government of India.

[2]. "Iot Based Flood Detection and Notifications System using Decision Tree Algorithm (ICICCS 2019) IEEE Xplore Part Number: CFP19K34-ART; ISBN: 978-1-5386-8113-8". By K.Vinothini1 PG Student, and Dr.S.Jayanthy Professor, Department of ECE Sri Ramakrishan Engineering College Coimbatore, India.

[3].By Soubhagya P, Sreyasukumaran, Vishnu G M BTECH students Dept. of Electronics & Instrumentation Engg. KMEA Engineering college, Ernakulam, Kerala, India.Prof. Rashida Hameed Professor Dept. of Electronics & Instrumentation Engg. KMEA Engineering college, Ernakulam, Kerala, India. [2020].

[4]. The Global Flood Detection System". By Zsófia Kugler ,Tom De Groeve, EUR 23303 EN - 2007 [2007].

[5]. "A Study of Internet Instant Messaging and chat Protocols". By Raymond B. Jennings III, Erich M. Nahum, David P. Olshefski, Debanjan Saha, Zon-Yin Shae , and Chris Waters [2006].

[6]. Flood Detection and Water Monitoring System Using IOT 1. MinakshiRoy, 2. Prakar Pradhan, 3. Jesson George, 4. Nikhil Pradhan 1Assistant Professor of Dept of Computer Science and Engineering,

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[7]. Dr.C K Gomathy, Article: The Efficient Automatic Water Control Level Management Using Ultrasonic Sensor, International Journal of Computer Applications (0975 – 8887) Volume 176 – No. 39, July 2020.