



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Special Issue 2, March 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.379**



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

# Smart Flood Alert System using IOT

<sup>1</sup>Narveer Omkar, <sup>2</sup>Doke Hrushikesh, <sup>3</sup>Shinde Kunal, <sup>4</sup>Prof. A. P. Bangar

<sup>1,2,3</sup>UG Student, Dept. of Computer Engineering, JCEI's Jaihind College of Engineering Kuran, Savitribai Phule Pune University, India

<sup>4</sup>Assistant Professor, Dept. of Computer Engineering, JCEI's Jaihind College of Engineering Kuran, Savitribai Phule Pune University, India

**ABSTRACT:** Floods are fundamentally catastrophic events that bring extreme devastation to any nation. They are usually caused by precipitation and flooding of waterways and occur especially during severe storm seasons. This project aims to monitor flood conditions and send alerts when IOT risks occur. Measuring rising water levels is used for flood detection. The system uses sensors to record temperature, humidity and water level at each stage. The captured sensor values are processed by the Arduino and sent to the IOT via the Wi-Fi module. A proposed system based on IOT technology will provide real-time analysis of floods and enable authorities to monitor flood-affected areas. This white paper emphasizes flood monitoring systems as warning and warning systems for real-time, efficient monitoring of critical floodprone areas without consideration of cost or safety measures. The proposed system also alerts authorities and civilians to the danger of flooding when monitoring parameters exceed their thresholds.

**KEYWORDS:** Flood Detection; Internet of Things; Sensors; Arduino UNO; Forecasting System; Early Warning System.

## I. INTRODUCTION

“Smart Flood Alert System” is a system which can keep close watch over various natural factors to predict a flood. Natural disasters like a flood can lead to property damage and loss of lives. To reduce the impacts of the flood on environment, the system uses various natural factors to detect flood. The system also has a Wi-Fi connectivity, thus its collected data can be accessed from anywhere quite easily using Internet of Things technology. The motivation for this work is to explore the idea of designing a system that can detect the floods and measure the water level, and notify the public and the local authorities regarding flood conditions that can improve the existing systems implementation of the system is presented where the system is successfully developed and tested. This flood caused serious damage to houses, roads, businesses, public facilities and even killed people. Though many steps have been taken by the government in order to prevent these incidents, but it seems went unsolved. The Flood Detection and Warning System is able to detect the floods and measure the natural factors that can be categorized into three different levels such as Yellow Alert, Green Alert and Red Alert in order to alert the public and the local authorities regarding flood conditions at the affected areas.

## II. RELATED WORK

[1] B Maruthi Shankar, S Karthick, Manjula Pattnaik, Tegil J John, Balachandra Pattanaik, S Karthikeyan, “Internet of Things based Smart Flood Forecasting and Early Warning System”, 2021 5th International Conference on Computing Methodologies and Communication (ICCMC)

The framework is to caution individuals in the upstream and the downstream about impending blaze floods and observing precipitation.

- The module was made in any case AVR processors and utilized mostly as same as Arduino MCU. Thus, the module works dependent on Arduino IDE C++ compiler.
- ESP8266 was used as controller to interact with hardware and web API.
- IBM WATSON CLOUD PLATFORM was used to store data.
- Buzzer alert was generated after crossing the threshold values.

[2] K.Vinothini, Dr.S.Jayanthy, “IoT Based Flood Detection and Notification System using Decision Tree Algorithm”, 2019 International Conference on Intelligent Computing and Control Systems (ICCS)

- PIC16F877a microcontroller was used to interact with sensors.
- Wi-Fi module was used to transfer data to cloud.

- System generate alert based on 3 different water level.
- Decision Tree Classifier was used to classify the levels with accuracy 99.62%

[3] Hung Ngoc Do, Minh-Thanh Vo, Van-Su Tran, Phuoc Vo Tan, “An Early Flood Detection System Using Mobile Networks”, 2015 International Conference on Advanced Technologies for Communications (ATC)

- The model was made using microcontroller.
- System generate alert based on 3 different water level.

[4] Fatereh Sadat Mousavi, Saleh Yousefi, Hiram Abghari, Ardalan Ghasemzadeh, “Design of an IoT-based Flood Early Detection System using Machine Learning”, 2021 26th International Computer Conference, Computer Society of Iran (CSICC)

- The machine learning model was build using ANN, LSTM, RNN algorithms.
- LSTM has the best result. The value of NSE and RMSE in LSTM model is 0.530 and 0.059.
- Star topology LoRaWAN module was used to transfer data.

[5] Salami Ifedapo Abdullahi, Mohamed Hadi Habaebi, Noreha Abdul Malik, “Flood Disaster Warning System on the go” , 2018 7th International Conference on Computer and Communication Engineering (ICCCE)

- The model was made using node MCU ESP8266
- Wi-Fi module was used to transfer data to think speak server.
- System generate alert based on 3 different water level.
- ANN algorithm was used to classify the levels with accuracy 98.9%

[6] Amina Khan, Sachin Kumar Gupta, Elyas Ibraheem Assiri, Mamoon Rashid, Younus Talha Mohammed, Mohd Najim, Yousef Ruzayq Alharbi, “FLOOD MONITORING AND WARNING SYSTEM: HET-SENS A PROPOSED MODEL”, 2020 2nd International Conference on Computer and Information Sciences (ICCIS)

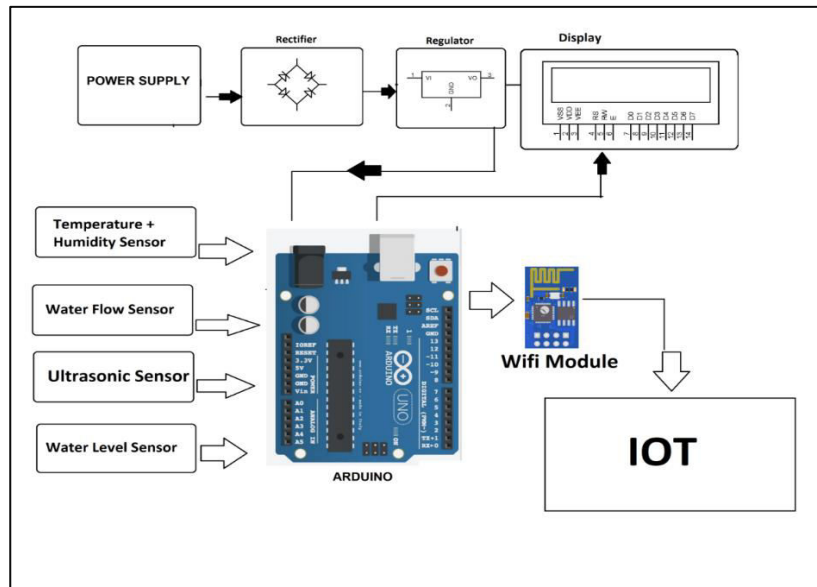
- The model was made using preliminary relay integrating with sensors.
- The data was transferred using Radio Frequency Transmitter

### III. PROPOSED SYSTEM

The Proposed methodology is to develop a quick alert system which can alerts multiple authorities, rescue teams, and citizens at a time by sending a SMS alert through the system. by monitoring the climatically conditions of the environment through multiple sensors such as Temperature Sensor, Ultrasonic Distance Sensor, Humidity Sensor, Water Level Sensor, Water Flow Sensor, Arduino Uno R3 as a controller.

Temperatures Sensor will detect the temperature from the surrounding environment, Ultrasonic Distance Sensor will detect the moving water surface conditions, Humidity Sensor will detect the rain drops in the environment, Water Level sensor will monitor the rising level of water, Water flow sensor will monitor the rate of flow of water and Arduino Uno will interact with the sensors and web API through Wi-Fi module.

#### IV. SYSTEM ARCHITECTURE



**Fig 1:-SystemArchitecture ofSmart FloodAlert System**

The proposed system is build using integrating various sensors with Arduino Uno R3. Firstly once the system is initialized all the sensors will start monitoring the environment and will produce reading from environment, Secondly these reading will further transmitted Arduino Uno for further processing there after converting the analogue and digital output into graphs and numerical from respectively and it will further transfer to API with the help of Wi-Fi module to display the output in real time scenario. If the observed output crosses the threshold values then the system will produce an alert to the authorities and citizens by sending a SMS [Fig1].

#### V. CONCLUSION AND FUTURE WORK

This paper gives a short venture that is helpful for citizens, authorities, and rescue teams. This work was able to meet our requirements quite well. This undertaking was intended to really identify the possibility of early flood alert utilizing various sensors with Arduino Uno. The finishing of this model proposes that sensor based system can be utilized for partial situations of flood alert recognition. More sensors can be utilized to perceive complete and accurate alert satisfying all flood occurring situations.

#### REFERENCES

1. B Maruthi Shankar, S Karthick, Manjula Pattnaik, Tegil J John, Balachandra Pattanaik, S Karthikeyan, "Internet of Things based Smart Flood Forecasting and Early Warning System", 2021 5th International Conference on Computing Methodologies and Communication (ICCMC)
2. K.Vinothini, Dr.S.Jayanthi, "IoT Based Flood Detection and Notification System using Decision Tree Algorithm", 2019 International Conference on Intelligent Computing and Control Systems (ICCS)
3. Hung Ngoc Do, Minh-Thanh Vo, Van-Su Tran, Phuoc Vo Tan, "An Early Flood Detection System Using Mobile Networks", 2015 International Conference on Advanced Technologies for Communications (ATC)
4. Fatereh Sadat Mousavi, Saleh Yousefi, Hiran Abghari, Ardan Ghasemzadeh, "Design of an IoT-based Flood Early Detection System using Machine Learning", 2021 26th International Computer Conference, Computer Society of Iran (CSICC)
5. Salami Ifedapo Abdullahi, Mohamed Hadi Habaebi, Noreha Abdul Malik, "Flood Disaster Warning System on the go", 2018 7th International Conference on Computer and Communication Engineering (ICCCE)
6. Amina Khan, Sachin Kumar Gupta, Elyas Ibraheem Assiri, Mamoon Rashid, Younus Talha Mohammed, Mohd Najim, Yousef Ruzayq Alharbi, "FLOOD MONITORING AND WARNING SYSTEM: HET-SENS A PROPOSED MODEL", 2020 2nd International Conference on Computer and Information Sciences (ICIS)



Impact Factor: 8.379



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 9940 572 462  6381 907 438  [ijircce@gmail.com](mailto:ijircce@gmail.com)



[www.ijircce.com](http://www.ijircce.com)

Scan to save the contact details