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IOT Flood Monitoring & Alerting System

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ABSTRACT: Flood is an unavoidable natural disaster in all Flooding is usually brought on by an increased quantity of water in a water system, like a lake, river overflowing. On occasion a dam fractures, abruptly releasing a massive quantity of water. The outcome is that a number of the water travels into soil, and 'flooding' the region. Rivers are involving river banks, in a station.Aside from lack of products and house and office property, streets infrastructure flood water consists of bacteria and sewage flow of waste sites and chemical spillage which leads to a variety of diseases afterwards.

KEYWORDS: Raspberry Pi3, ARM Cortex A53, Analytics software, Application program Interface, Sensors and Python programming.

I. INTRODUCTION

As we all know that Flood is one of the major well known Natural Disasters. When water level suddenly rises in dams, river beds etc. Alot of Destruction happens at surrounding places. It causes a huge amount of loss to our environment and living beings as well. So in these case, it is very important to get emergency alerts of the water level situation in different conditions in the river bed.The purpose of this project is to sense the water level in river beds and check if they are in normal condition. If they reach beyond the limit, then it alerts people through LED signals and buzzer sound. Also it alerts people through sms and Emails alerts when the water level reaches beyond the limit.

II. Algorithm

1. Start.
2. Connect all sensors to the microcontroller.
3. Detecting the water level.
4. If water is at level 1, goto step 3.
5. If it reaches threshold value, send an alert message through LED or Buzzer.
6. It sends alert messages to mobile phones through android applications.
7. Meanwhile, Microcontroller will have serial communication with raspberry pi..
8. Raspberry pi will help send data to the cloud.
9. Predicting the chances of flood through historic data using a prediction algorithm.
10. Similarly, detecting the water level through predicted data in the control room.
11. If the predicted value is unsafe, goto step 5.
12. Or else, repeat step 9.
13. Stop.

II. MOTIVATION

This flood monitoring system is designed and developed to warn and alert both authority and the owners of the vehicles about the flood almost immediately. A water level sensor will be set at two points of water level which is at 0.05 m and 0.09 m. When the water reaches this point, it will light on the Light Emitting Diode (LED) and trigger the buzzer that acts as an alarm to alert both authority and owner. All the readings of water level are shown in an application called Blynk that will connect through the connection of a Wireless Fidelity (Wi-Fi) for reference. This project applied both, hardware and software programming. The hardware components of this system is divided into three (3) main parts which are: i) the water level sensor as the input system, ii) an Arduino Mega 2560 as the main microcontroller which control all inputs and output of the system and an ESP 8266 Wi-Fi module as an interface with the output and connection to application respectively and, iii) an LED and a buzzer as the output system. Meanwhile, for software programming, Arduino software IDE is used for hardware coding. Hence, a system and mechanism for real-time surveillance of the potential flooding at the car park should be established. Other researchers also implement this type of project to overcome the flood crisis. The project as reported in [7-8] is quite similar with this project, but was more focused more on the detection of water level. Unfortunately, the system cannot send any notification directly to the users. Besides that, researchers in [8-9] also developed roughly the same system, where the system can warn and alert users through a technology called Global System Messaging (GSM) technology. System which is used in this research possesses advantages compared to these two systems where it can send notifications prompt, direct and fast, in fact the fastest to the users. Users can receive this notification through an application called the Blnyk Application that has been installed in each user's smartphone. This system has been implemented with the latest technology called the Internet of Things (IoT), that have this amazing capability of sending any information wirelessly. The objective of this project is to design, develop and build a flood warning system especially for parking spaces that will alert and warn the vehicle owner apart from developing an application that can be monitored effortlessly via a newest technology of wireless connection.

III. CONCLUSION AND FUTURE WORK

Nowadays the Internet Of things (IOT) is broadly used in worldwide, this system will display the data of the water level measured on LCD display. This project can be very helpful to the Meteorological Department to continuously monitor the dams and river beds water level. With this project it can save many people lives by giving alerts when the

IV. FUTURE SCOPE

This study is conducted to solve the problems brought about by floods. The device shall contain with the following features: It has ultrasonic sensor to sense the distance of water level of flood on the road. The system provided a camera that will display the real-time image of the flood that can view via livestream. It includes Serial Communication to send warning text message with the content of date, time, water level and road accessibility. The system has three (3) modules which are Users, Logs, and Contact Numbers. It can be modify by the admin. The unit containing the sensor is suggested to be place in front of Our system. The position of the sensor must be placed perpendicular to the flood water; otherwise, there will be an imperfect reflection of ultrasonic waves and cause measurement errors. The sensor is suggested to be placed on a pole with a height of about 3 to 3.5 meters. The flood sensors and microcontrollers will be powered by a Solar Power Bank with 80, 000 Ampere Ampere-Hour (mAh) for the benefit of continuous operation of water flood height detection and network data transmission. water level crosses beyond the limit. This project is very cost-effective, flexible and productive in areas where flood conditions happens everytime

V. OBJECTIVE

The main objective of this project is to develop and design a flood detection system that will detect flood automatically and send data to the Local Government Unit and to residents using an Arduino. Specific Objectives
∟ To design a circuit and create a programming code using the microcontroller.

∟ To apply the Serial Communication in transmitting the data from one place to another place.
∟ To detect the current level of the flood where the system sensor will be divided into four levels.
∟ To warn residents of Barangay Marulas, Valenzuela City about the flood water level.
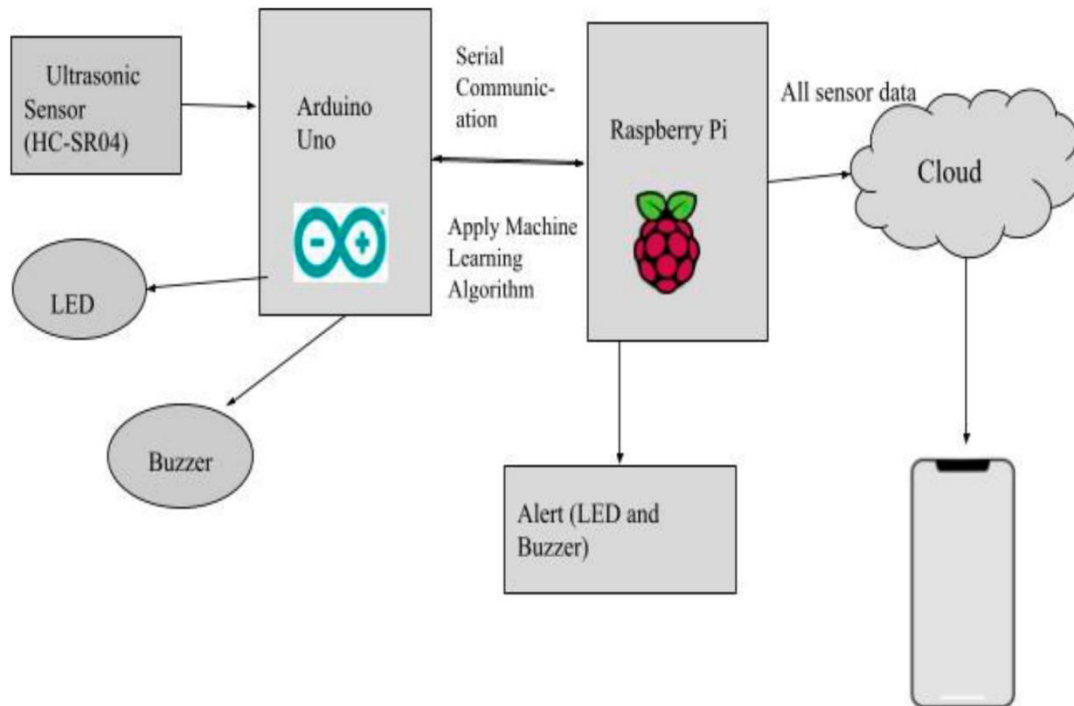
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