

RIVERSIDE NETWORK FOR EARLY FLOOD WARNING SYSTEM BASED ON IOT

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Abstract- The flood detection system monitors and detects the occurrence of floods and then sends flood notification SMS to the inhabitants of such zones for necessary action. The objective of this project is to send the alert to riverside people so that they can safely move from flood area.

It gives alerts through SMS. The flood monitoring and detection system not only monitors and give alerts to the authorities but also provides future predictions for the future disasters to the user.

This research proposal is basically for implementing flood alert system in Indian environment by using weather forecasting data, and wireless sensor networks. The wireless sensor networks play an important role in transmission and monitoring the data, we can collect telemetered rainfall data and Flow of water and Level of water data from various locations, the system measures the River Water Level, Flow of water and different weather condition through wireless sensor networks. It also sends flood notification messages to the inhabitant of such zones and base station of that area for necessary action. The designed system is based on WSN and it is used to monitor, detect and report the environmental status to a control unit using relative water level, temperature, humidity and water flow in the river as flood indicators, whose values are gathered by sensors in the sensor field. If the obtained values are out of threshold values, the system alerts the inhabitants via SMS and the continuous monitoring of the weather condition is made possible with the help of a cloud platform ThingSpeak.

Keywords: Early Flood Warning System, River side, network, Water level, ThingSpeak, safe, Threshold, temperature, humidity, water flow

1. INTRODUCTION

The Internet of Things (IoT) is the network of physical objects or “things” embedded with electronics, software, sensors and network connectivity, which enables these objects to collect and exchange data. IoT allows objects to be sensed and

controlled remotely across existing network infrastructure, creating opportunities for more direct interactions between the physical world and computer-based systems and resulting in improved efficiency, accuracy and economic benefits.

1.1 Flooding and Impact towards mankind

Flooding has always resulting in enormous anxiety on countries across the continent whereby loss of life's, people displaced, agricultural land submerged in mud's, roads, bridges and houses washed away. As a result of flooding, the damages on properties are clearly visible. Many individual and organization required to spend time and afford to reduce the overhead on the flood restoration plans for the infected locations and as well as for the victims. Most of these plans involve big amount of money and lots of human force such as rescue workers, doctors, nurses, engineers and etc. Other than the human forces, the government has to spend a big amount of money in various restorations of physical structures in the flood infected locations. If only River Side Network for Early Flood Warning System has been effectively utilized, these losses can be reduced and appropriate steps in fighting against the flooding scenario can be taken in the shortest time within the available resources.

1.2 Objectives

- Build minimal river environment equipped with monitoring and controlling system
- Constantly monitor environmental conditions like temperature, humidity, water level in river and water flow rate of river to keep checking whether it crossed threshold parameters or not.
- It focuses on all the parameters and warns the people nearby by sending a message to mobile.
- The user can see live condition of river and environmental conditions on ThingSpeak website or things viewer mobile application from any location.

2. METHODOLOGY

The elementary idea behind the River Side Network for Early Flood Warning is a flood can be predicted or forecasted through the environmental conditions like temperature and humidity and also, the behavior of river like rise of river level and river flow. Thus, we can keep measuring these values and set a few threshold parameters to these conditions and if it crosses that threshold it shows the flood warning and sends a message to the people nearby. It can be achieved through IoT as it has a massive flexibility of sensors usage and such things. As we chose IoT, we need to some of the sensors like:

- Temperature and Humidity Sensor (DHT11)
- Water Level Sensor
- Flow Sensor

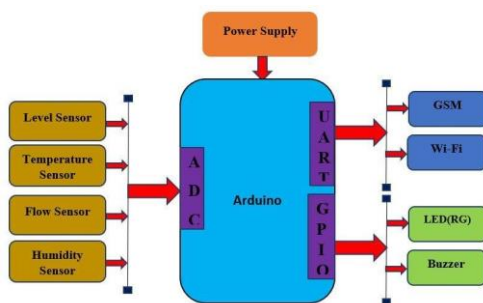


Figure 1. Block Diagram of Circuit

As shown above, the sensors are connected to the IC Atmega328p and that IC is programmed accordingly to measure live parameters and the threshold values have been given inside the program so that when the values are out of threshold shows the warning message and sends an SMS to the mobile numbers described inside the program.

3. RESULTS



Figure 2. LCD showing live readings

Riverside network for early flood warning system is designed and is programmed to automatically measure the temperature, humidity, water level of river and water flow rate. The values of Temperature, Humidity, Water Level and Flow Rate are displayed on the LCD display on the kit as shown in figure.

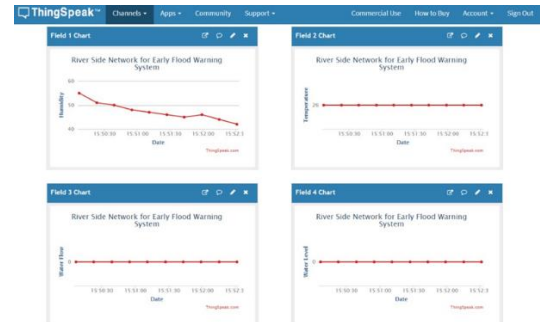


Figure 3. Live values displayed in ThingSpeak website

The values will automatically get uploaded to the things speak cloud once the kit is connected to the Wi-Fi through ESP8266. And the values were shown on things speak with the graphical representation on the ThingSpeak website as well as in a third-party mobile app names ThingSpeak viewer as shown in figure below.



Figure 4. LCD showing Flow Alert warning

If the values are out of programmed threshold parameters, it shows that the flood is coming. The warning of the flood is displayed on the LCD in the kit as shown in figure

Even a programmed message been sent to the predefined numbers inside the program through GSM module installed in the kit, when the values crosses the threshold parameters. The messaged received by the used is shown in the figure below.

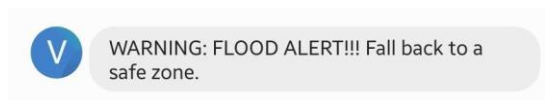


Figure 5. Flood warning message received by the user

4. CONCLUSION

The River Side Network for Early Flood Warning System is designed to be an intelligent gadget which is capable of sending real time water level information from a remote location to a monitoring station which could be at a distance away, regardless of time. A step-by-step approach in designing the microcontroller-base system for the measurement of four essential parameters i.e. temperature, humidity, water level and water flow rate has shown that the system perform is quite reliable and accurate.

5. ACKNOWLEDGEMENT

We are grateful to my guide Mr. Biswa Ranjan Barik, Associate Professor, ECE for having given me the opportunity to carry out this project work.

We take this opportunity to express my profound and whole heartfelt thanks to my guide, who with his patience support and sincere guidance helped me in successful completion of the project. We are particularly indebted to his innovative ideas, valuable suggestions and guidance during the entire period of my project work and without his unfathomable energy and enthusiasm, this project would not have been completed.

We would like to express my deep sense of gratitude to Dr. T. V. Prasad, Principal GIET(A). For providing me a chance to undergo the course in the prestigious institute.

We would like to thank Dr. S. V. R. K. Rao, Professor and Head of the Department of ECE, for valuable suggestions throughout my project which have helped in giving definite shape to this work.

We would like to thank all the faculty members and non-teaching staff of Department of Electronics and Communication Engineering, GIET(A) for their direct and indirect help during the project work.

We own our special thanks to the MANAGEMENT of our college for providing necessary arrangements to carry out this project.

The euphoria and satisfaction of completing this project will not be completed until we thank all the people who have helped me in the successful completion of this enthusiastic task. Lastly, we thank our parents for their ever-kind blessings.

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