Tinkerers internship

Task 1:- Research of problem statement

Name: Pratiksha Mhadgut.

Class: D6A

DOS: 17/06/2021

IOT Based Flood Prediction System

Problem statement:

Floods are naturally occurring events in our environment.They mainly happen when the catchment of river receives Greater than usual amounts of water (due to either heavy Rainfall or melting snow). The river cannot bear this extra Water in its streams and causes the water level in the river to Rise and flow out of streams leading a flood to take place. This flooding may take place at any point along the river Course and not necessarily at the place where the extra water has entered.Floods are among the most common damaging natural disasters that affect millions of people across the world leading to severe loss of life and damage to property, infrastructure and agriculture.To detect a flood the system observes various natural factors, which includes humidity, temperature, water level and flow level. To collect data of mentioned natural factors the system consist of different sensors which collects data for individual parameters.Flood prediction models are of significant importance for hazard assessment and extreme event flooding.Flooding is a natural phenomenon which has attracted global attention as result of its negative impact on the society.

   For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor.The water level is always under observation by a float sensor, which work by opening and closing circuits (dry contacts) as water levels rise and fall.The flow sensor on the system keeps eye on the flow of water.The water flow sensor consists of a plastic valve body, a water rotor, and a hall-effect sensor. When water flows through the rotor, rotor rolls. Its speed changes with different rate of flow.The system also consist of a HC-SR04 Ultrasonic Range Finder Distance Sensor.All the sensors are connected to Arduino UNO, which processes and saves data. The efficient drainage management and proper techniques can reduce the risk of floods. The development process has led many modernized areas. The lowland area has been redeemed by taking the land from the hills. There are also tributaries buried for the site. Such activities are the factors that cause floods.

Software requirements:

Arduino Uno

Proteus software

Hardware requirements:

Water flow sensor(**YF-S401**). **Range:**300ml to 600ml per minute

Wifi module(ESP8266). **Range:**300m for outdoors

Ultrasonic sensor(HC-SR04) **Range:**2cm to 400cm

Temperature and Humidity Sensor(DHT11)

 Range: The temperature range of DHT11 is from 0 to 50 degree Celsius with a 2-degree accuracy. Humidity range of this sensor is from 20 to 80% with 5% accuracy.

Rain sensor

Buzzer

Light Emitting Diode

Arduino Uno

Addition updates:

In this system we can add wifi module or buzzer.On detection of conditions of flooding the system predicts the amount of time it would take to flood in a particular area and alerts the villages/areas that could be affected by it. The system also calculates the time it would take for flood to reach them and provides a time to people so that they can evacuate accordingly.The system has wifi feature, which is useful to access the system.This system is suitable for cities and village areas. Furthermore, if the public has an internet access, they can monitor what is happening and predict if there is any upcoming flood at the web server.

Advantages:

- Sensors are available to measure particular actions.

- Monitoring system is done automatically.

- Damage can be reduced.

- At emergency condition, necessary action to be taken because of the early flood prediction.

Applications:

To eliminate or lessen the impacts of the flood, the system uses various natural factors to detect flood. The system has a wifi connectivity, thus it's collected data can be accessed from anywhere quite easily using IoT. To detect a flood the system observes various natural factors, which includes humidity, temperature, water level and flow level. To collect data of mentioned natural factors the system consist of different sensors which collects data for individual parameters.

Challenges:

Successful implementation of the Internet of Thing (IoT) is precursory to a thriving smart city. However, the technical, physical, and environmental conditions can often pose challenges in their successful deployments. The deployment is further complicated if the time and location of implementation are amidst a natural disaster. In this work, we use flash flood detection as a natural hazard testbed and describe various IoT deployment, our progression, and first-hand experience from those implementations.

Conclusion:

In this , a system for short-term flood prediction is proposed. The proposed flood prediction system can be deployed as a battery powered IoT system with low deployment and maintenance costs.This project highlights the possibility to provide an alert System that will overcome the risk of flood.It will monitor each and every aspect that can lead to flood. If the water level rises along with the speed, it will send an alert Immediately. It also ensures increased accessibility in dealing and reverting to this incident. It will help the community in taking quick decisions and planning against this disaster.

References:

[1] Journal of Innovative Technology and Exploring Engineering (IJITEE)ISSN: 2278-3075, Volume-9 Issue-6, april 2020Iot Based Flood Monitoring and Alerting System with Weather Forecasting Garima Singh, Nishita Bisht, Pravesh Bisht, Prajjwal Singh

[2] Prediction System using Multilayer Perceptron Classifier and Neural Networks.International Research Journal of Engineering and Technology (IRJET)   https://www.irjet.net/

[3] Monitoring and Prediction System: An Implementation of Dynamic Web (PHP) and Internet of Thing   (IoT) Mohammad Noor Bin Ibrahim, Hisham Bin Mohd Adham,Ahmad Zafir B. Latib. https://www.researchgate.net/publication/346521133

 http://www.aiua.asia/journaljourn

[4]Prediction Using Machine Learning Models Amir Mosavi , Pinar Ozturk ,and Kwok-wing Chau

        www.mdpi.com/journal/water