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Automatic Surveillance Of Areas Affected By Floods Using Twitter

D.Sasitharan , A.Jayakumar

Abstract— Floods are one of the major and frequent natural disasters accounting for 44% of deaths caused by natural disasters. Though many number of researches being made in the prediction of flood and implemented they are not accurate enough because of the fact that it is very much difficult to predict the nature. But we can integrate the rescue process as much as possible with the use of technologies present. In the existing system there is some delay for the protection force in finding the locations, intensity of the flood. The condition and the level of the floods are also unknown .The protection force don't have any idea which area to serve first and which next. A device is employed which captures the image of the area as soon as the flood level reaches the defined threshold leve . Further tweets the message with image to the specified twitter account. This in turn allows the protection force to have a knowledge of how worse the situation is. There will be no delay in communicating the message thus overcoming the drawbacks of the existing system.

Keywords : Wifi modem , Ultrasonic sensor

I. INTRODUCTION

Floods are one of the most commonly occurring natural disasters, and caused more than 120,000 fatalities in the world between 1991 and 2005. Floods are a major problem in many areas in the world, and are expected to become worse due to global warming, which causes more extreme weather events around coastal areas. In 2010, floods were not only responsible for more than 4000 deaths worldwide but also caused considerable economic loss. The 2015 South Indian floods resulted from heavy rainfall and over 18 lakh people were displaced. With estimates of damages and losses ranging from nearly 200 billion to over 1 trillion While these natural disasters are unavoidable, the intensity of the loss can be minimized by a proper warning system, which will also give emergency responders real time data to organize their operations. Though rain monitoring systems have been used for flood prediction and estimation before, flood caused by extreme rains cannot be accurately predicted with these systems, as flood propagation models require hundreds of parameters which are difficult to know beforehand. Similarly, fixed water level sensors are only adapted to river monitoring, and are unsuitable to desert environments in which the location and the extent of a flood cannot be estimated reliably. A recent effort to directly measure water levels in a river was investigated in , but this technology only applies to rivers and cannot monitor large hydrological basins in which new water channels that cannot be predicted in advance are formed during floods. Other such efforts involve the use of indirect measurements from rain stations or from meteorological data, combined with flood propagation models that attempt to predict flood parameters such as the extension of flooded areas, water velocities and levels. The main drawback with this approach is the lack of accurate model parameters. The inaccuracy of these model parameters can drastically change the predicted flood behavior, leading to a very unreliable flood warning system, so we are moving over to concentrate on the flood monitoring system which exactly represents the location using social media. In recent years, research on social media analytics for crisis intelligence has seen exponential growth in the areas of information mining and data visualization. Services like Twitter, Facebook, and Weibo have established a novel information channel that constantly provides real-time observations and situation reports from a worldwide community of users. Once made accessible, data from these sources could tremendously help to support information gathering in domains like disaster response, critical infrastructure management, and general public safety. In this system a concept is conceived to report the level of flood with the accurate location to the protection force and the people using social media.

D.Sasitharan, Applied Electronics, IFET College of Engineering, Villupuram, India. (Email : sdtharan@gmail.com)
A.Jayakumar , IFET College of Engineering ,Villupuram, India.

II. PROBLEM STATEMENT

In the existing flood monitoring system the absence of timely information of the flood is not sent properly to the protection force. The location of the affected area is also unknown exactly In addition to this the clear scenario of how worse the situation is also not known to the protection force. The people are unaware of the situations of their surroundings which makes it difficult for them to navigate. The method monitored using social media also faces several problems such as the fallacious datum and it poses a huge work of analyzing it to get the abstract data.

III. PROPOSED SYSTEM

The human interactions on the Data Production side for the best optimum reliability. The device which is capable of Tweeting the image of the areas affected by floods when sensed is employed. It then sends to the dedicated twitter account. Hence the human interaction will be eliminated decreasing the fallacious data. The timely information as soon as the condition becomes worse will be sent to the authority. The exact condition of the scenario will be known. The anomalies that created false data will be eliminated. The need

to extract data will be eliminated to a greater extent. The exact scenario will be given by the pictures taken from the camera employed. The data anomalies will be eliminated by replacing the human interactions by devices. Timely information will be produced by the deployed devices.

IV. FLOW PROCESS OF THE PROPOSED SYSTEM:

Figure 1.shows flow process of the proposed model. When the system is switched on the ultrasonic sensor starts measuring the level of water and when it reaches the defined threshold level the signal is sent to the processor. The processor further commands the camera to capture the image which is saved in the memory and further processed to tweet the image along with location to the dedicated twitter account.

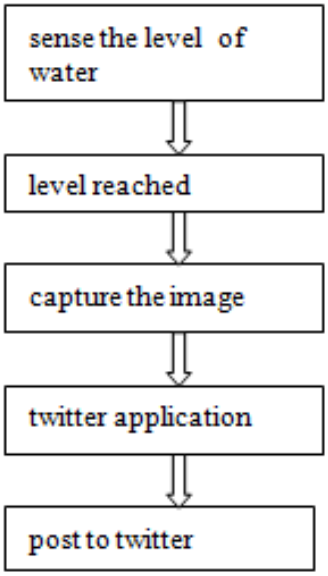

fig.1 flow process

V. METHODOLOGY

The overview of the system can be given as the ultrasonic sensor is going to measure the water level and send the signal to the processor wherein the processor orders the camera to capture the image the image is stored in the memory and further the image from the memory along with the location is made to tweet to the dedicated twitter account.

Since we are not going to use the system all the days the device is provided with a web switch wherein it allows us to switch on the device only during the time when the flood is likely to occur. The device is going to be fixed on top of the EB post wherein it allows us to make use of the electricity from it. This poses an impediment of getting approval from the government. Since the current drawn from the electric line will be of the greater voltage a switching circuit is provided to regulate and give the required power supply. During heavy flood times where the power supply is outraged for about a week the system has to get the supply from somewhere so a battery is placed with device to provide power when there is no power supply. The web switch, processor are all connected through Wifi modem. The ultrasonic sensor is used to measure the water level. The sensor is placed at the top of the pole and it sends the signal through transmitter and receives the echo reflected from the water the level of the flood can be measured using the time taken for the wave to reflect. Thus in this way when the level of the flood rises above the defined threshold value the signal is sent to the processor.

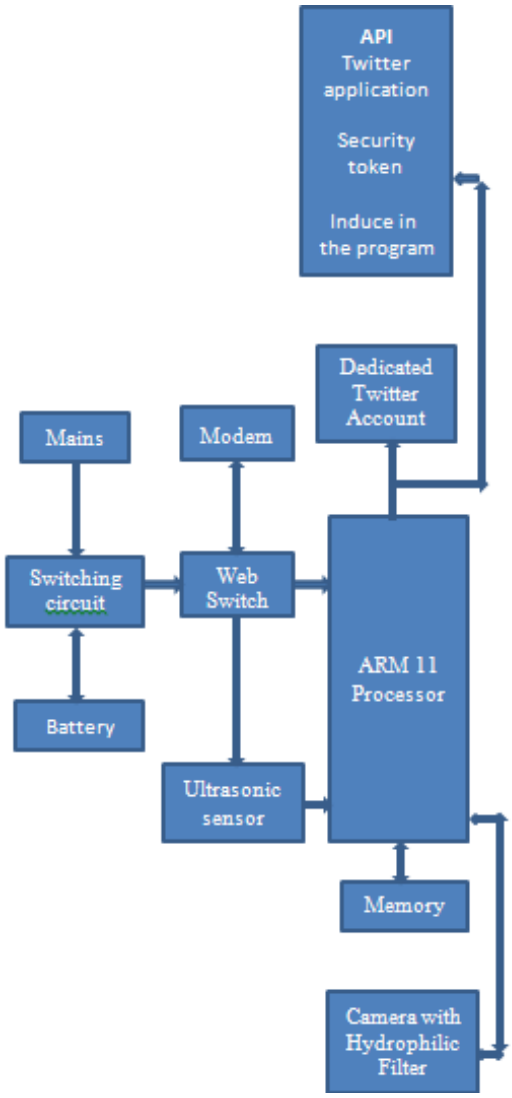

fig.2 block diagram

When sensed the camera captures the image and the processor saves it in the memory. Since the camera gets affected during rain where the rain drops will form a bead on the surface of the camera. To avoid this we have to know what causes it .the reason behind the formation of bead on the camera surface is low surface tension. so a glass of high surface tension is employed to avoid forming a bead.

The next process is creating the twitter application and getting the access tokens wherein we are going to use them as the destined address for tweeting the image. The processor is programmed in python in a way to attach the image and location to the dedicated twitter account at desired intervals.

VI. EQUIPMENTS INVOLVED:

A. Camera:

The camera may be normal one but since it could not capture a clear picture while raining we are going to employ "HYDROPHILIC FILTER".

B. Principle behind the filter:

The reason behind the formation of beads on the surface of the camera is that it has less surface tension.so in order to avoid this a material of low surface tension is used that the water droplets falling on the surface is made to fade out rather than forming as a bead.

C. Modem:

The ultimate purpose of the modem is to provide data connection the processor where we don't have the access of public wifi. The wifi kind of modem used here is

D. Arm Processor:

This is the heart of our system where it is going to sense the signal from the water level sensor. Further orders the camera to capture the image further saving the image in its memory. The image is then tweeted.

E. Image Processing:

The action of capturing and saving the image is described here the image processing library is imported in the processor. The module provides some options to perform such as capture image, display image etc. Capture image is chosen and the pixels and resolutions are defined here for the camera. At the same time the interval at which the photo to be captured is also defined. Then the image is saved to the memory.

F. Tweeting the Image:

The processor is programmed in python language to send the image along with location to the Twitter where both the authorities and the people can have an access to it.

VII. CONCLUSION

An efficient surveillance system which gives the timely information during floods with accurate location to the protection force as well as people whom may use it for their navigation purpose has been implemented. The uniqueness of this project is that there is cent percent accuracy. The data acquired from the social media is thus pipelined efficiently to enhance the surveillance of the flood affected area.

REFERENCES

[1] Sagar Sudhakar Mane, M.K.Mokashi "Real-Time Flash-Flood Monitoring, Alerting and Forecasting System using Data Mining and Wireless Sensor Network"
[2] Yili Chan*, M. Mori** "Flood Monitoring System Website Using Google Earth And 3d Gis".
[3] Wei Zheng "The Flood Monitoring Information System Framework Based on Multi-source Satellite Remote Sensing Data".
[4] Mohamed Abdelkader, Mohammad Shaqura, Christian G. Claudel and Wail Gueaieb "A UAV based system for real time flash flood monitoring in desert".
[5] Dennis thom, Robert kruger "can twitter save lives?" A broad scale study on visual social media analytics for public safety.