IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Landslide, Flood Prediction Using WSN Data

[1]Shafiya S,[2]Mr R S Prasanna Kumar

[1]2nd year M.tech Student,[2] Associate Professor
Department of Computer Science and Engineering
PESCE,Mandya,India

Abstract: Disaster prediction is a challenging research area, where a future occurrence of the devastating catastrophe is predicted. In the project a simpler way of detecting the occurrence of landslide and flood has been introduced. It is based on collecting WSN data and using the API's where weather information API is used to fetch live weather details. The collected live weather of a particular place is used to predict the disaster. If there is a chance of occurrence of the disaster (landslide, flood) then an alert message is sent to the concerned authority to create awareness among people.

Index Terms - WSN , API, Landslide, Flood

I. INTRODUCTION

Monitoring of environmental disasters in real time is one of the basic requirements in the world. Different technologies have been developed for this purpose. Wireless sensor network (WSN) is one of the major innovations that can be utilized for real-time observing. Wireless sensor organize (WSN) refers to a group of spatially scattered and devoted sensors for checking and recording the physical condition information at a central area. WSN has capability of huge scale arrangement, low maintenance, versatility, flexibility for distinct scenarios etc. WSN has its confinement such as low memory, control, transfer speed etc, but its capability to be spent in threatening environment, and low maintenance necessity made it one of the leading suited innovation for real-time observing. Wireless sensor Networks (WSN) refers to a group of spatially scattered and devoted sensors for checking and recording the physical condition information at a central area. WSNs degree natural conditions like temperature, sound, contamination levels, stickiness, wind, and so on. These are similar to remote ad hoc networks in the sense that they depend on wireless network and spontaneous formation of network so that sensor information can be transported wirelessly.

WSN plays a major role because it is scalable and adaptable to the various scenarios. A flood is an overflow of water on normally dry ground. This is most commonly due to an overflowing river, a dam break, snowmelt, or heavy rainfall. A landslide is the movement of a mass of rock, debris, or earth down a slope. Rainfall is the most common cause for landslide and flood. The aim of the project is to predict the occurrence of landslide and flood using the live weather data fetched from the openweather using API's if there is any chance of occurrence of the disaster message is sent to the concerned authority to alert people and save their lives.

II. LITERATURE SURVEY

In the paper Landslide detection using wireless sensor network in disaster monitoring" [1].by Mr. R S Prasanna kumar, Shazia Anjum M S WSN and linear regression algorithm is used for landslide prediction

In the paper "Real-time Wireless Sensor Network for Landslide Detection", [2] IEEE by Maneesha V. Ramesh, landslide detection in Idukki, Kerala(dist) is a major problem. Wireless sensors can be used for disaster prediction by placing them under the ground from which the live weather data is fetched based on current time and place. The information fetched from the wireless sensors is used to predict the occurrence of the disaster.

Authors Pawan Nandkishor Hinge, Ramesh Bawage, Smt.Kashibai Navle have predicted the vibrations in the land and rocks which is a sign of danger. Vibrations will be passed to the accelerometer which will predict the danger level and the signals will be passed to the GSM module that will be used to pass an alert messages [3].

Balasaheb Bawche, Mr. Vaibhav Pandurang Gund, Mr. Suyog. S. Shah uses zigbee to sense the data and based on the soil and rock movements the disaster is predicted. if there is any chance of landslide occurrence the sensors will automatically sends the alert message to the people in a particular place by using warning system which is developed using different sensors[4].

Authors Huang Qingqing,Meng Yu,Chen Jingbo,Yue Anzhi, Lin Lei have considered the satellite images for research on a particular place. The high resolution images in a spatial area is compared with previous original images and result is represented in a graph[4]. Authors,Mr.Anand.S.Bhosle,Mr.Laxmikant,M.Gavhane have proposed a method to predict the disaster occurred in a forest ex: Fire in the forest. They used a standards such as IEEE 802.15.4 and ZigBee to sense the fire. If fire is detected then notification is provided to rescue operators[5]. Authors Imane Benkhelifa, Nadia Nouali Taboudjemat and Samira Moussaoui have surveyed and collected the data of different disasters like landslide, flood, earthquake by considering parameters atmosphere, humidity and pressure.They are using WSN for collection of data. The data is useful for the designers[5].Authors Nor Azlina Ab. Aziz , Kamarulzaman Ab. Aziz proposed a method for disaster detection with rescue and alert system and also proves that WSN is a prominent technology for disaster prediction.

III. PROPOSED SYSTEM

Early prediction of the disaster helps to save life of people . To predict the disaster we need live weather information which is fetched from a Python API using city id or city name and based on day, month and year. There are two modules admin and user, where admin can authenticate user and view the current weather details which is obtained from an API. The information is fetched based on the parameters such as mintemp, maxtemp, wind, clouds, rain, pressure, humidity. The major parameter is the rainfall which is passed to the landslide and flood prediction function and based on the threshold value the occurrence of the disaster is predicted. After obtaining the percentage of Landslide chances it is informed to the concerned authority. And also sends an alert message to the people of that particular place.

(a) LANDSLIDE

Landslide occurs when soil and rock move downwards with the organic contents due to the gravitational force from hills or mountains. It is usually started with different weather conditions and by other factors such as:

- construction work of roads sometimes needs to constructed across hills or mountains which leads to erosion of the stream.
- The changes of ground water level due to Heavy rainfall.
- Due to the construction work and earthquake Vibration occurs.

The landslide occurs due to above factors that leads to transport of materials by sliding, flowing and falling. The above factors which causes the different landslides are:

- Landslide occurrence rate starts from slow (millimeter/year) and rapid(meters/second).
- Due to slide, slump, flow and fall landslide is considered as a major natural disaster /which leads to huge loss of natural calamities such as human settlements, agricultural fields and forest lands. It also leads to loss of lives.

(b) WIRELESS SENSOR NETWORK

Wireless sensor networks (WSN) is used for analyzing of real time events. It is scalable has less maintenance cost and is adaptable for different conditions. But it has less memory and power. By using the sensors we can fetch the live weather information data which is performed by the API also by using satellite. In this project we fetch data from API.

(c) API

Application Programming interface(API) includes a procedural code by using that code a new application can be created and accessed. It acts as a messenger for delivering the requests to providers that we request and responses back.An API means functionalities which are independent of their implementations and definitions to vary without compromising each other. A good API helps makes the development easier by proving the building blocks for the program.API also enables the developer to create apps using the available information. It reduces the complexity of code and it can be used repeatedly.

API's used to fetch weather details:

"http://api.openweathermap.org/data/2.5/weather?q=".$city."&appid=".API_KEY

"http://api.openweathermap.org/data/2.5/forecast?q=".$city."&appid=".API_KEY

IV. RESULT

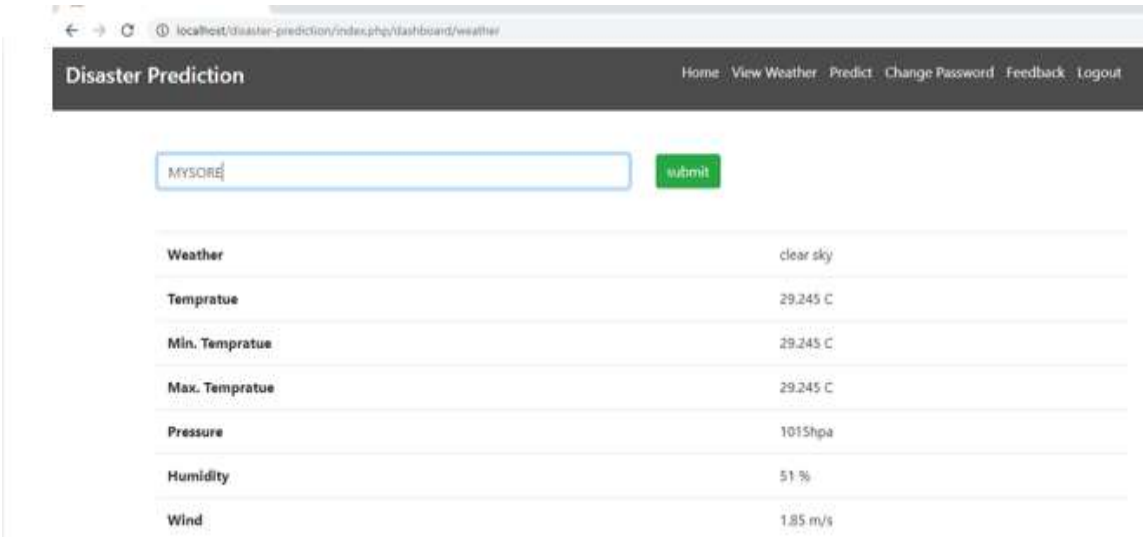

Fig.1. Weather Details

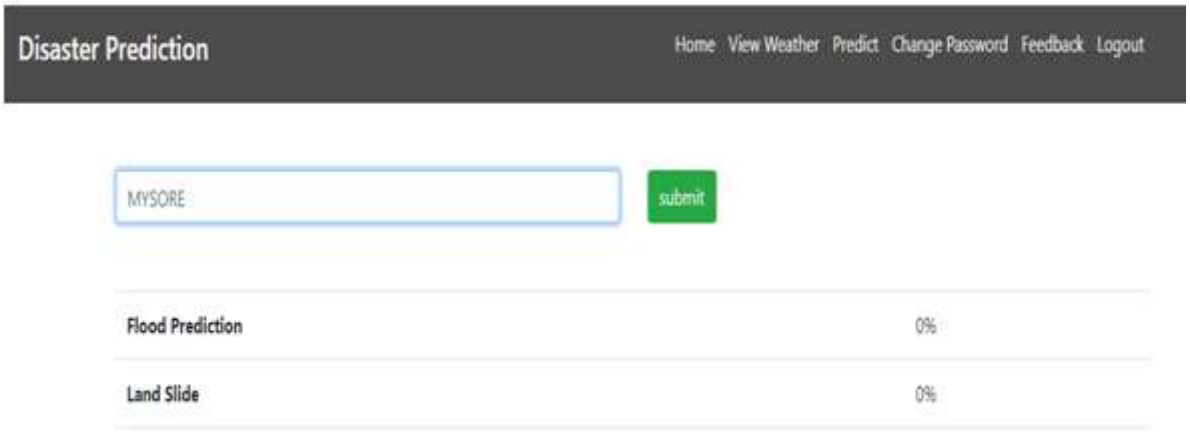

Fig.2. Prediction

V. CONCLUSIONS

Landslide, flood prediction using wireless sensor network data is a challenging research where in this work the disaster is predicted earlier by considering the various factors to save the nature and alert people. It can be extended by considering various other factors and the live data can be fetched using sensors for accurate results.

REFERENCES

[1] "Landslide detection using wireless sensor network in disaster monitoring" by Mr. R S Prasanna kumar, Shazia Anjum M S International Journal of Innovative Research in Science volume 8, issue 4
[2] Engineering and Technology Wireless Sensor Network for Landslide Detection Maneesha V. Ramesh, Sangeeth Kumar, and P. Venkat Rangan Amrita School of Engineering, Amrita Vishwa Vidyapeetham (Amrita University) Clappan P. O, Kerala, India 690525.
[3] Landslide Detection and Warning System using WSN Mr. Pranav Pravin Garje1, Mr. Sagar Balasaheb Bawche2, Mr. Vaibhav Pandurang Gund3, Mr. Suyog. S. Shah4, International Research Journal of Engineering and Technology (IRJET).2016
[4] Wireless Sensor Network for Detecting Vibrations Before Landslides Pawan Nandkishor Hinge Electronics Telecommunications Sinhagad Academy Of Engineering University Of Pune Rohit Ramesh Bawage Electronics And Telecommunication Smt.KashibaiNavle College Of Engg University Of Pune. International Research Journal of Engineering and Technology (IRJET).2014
[5] Landslide change detection based on spatio temporal context, Huang Qingqing, MengYu, ChenJingbo, YueAnzhi, Lin Lei
[6] Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing, China.
[7] Nayak DR, Mahapatra A, Mishra P.A survey on rainfall prediction using artificial neural network.International Journal of Computer Applications.2013; 72(16).
[8] Idris A, Rizwan M, Khan A. Churn prediction in telecom using Random Forest and PSO based data balancing in combination with various feature selection strategies. Computers & Electrical Engineering. 2012; 38(6):1808–19. http://dx.doi.org/10.1016/j.compeleceng.2012.09.001.
[9] Cosma G, Brown D, Archer M, Khan M, Pockley AG. A survey on computational intelligence approaches for predictive modeling in prostate cancer. Expert systems with applications.2017; 70:1– 19. 4. Jilani Z, Mehmood T, Alam A, Awais M, Iqbal T. Monitoring and descriptive analysis of radon in relation to seismic activity of Northern Pakistan. Journal of environmental radioactivity.2017; 172:43–51. https://doi.org/10.1016/j.jenvrad.2017.03.010 PMID: 28324685
[10] International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT) – 2016. Forest Disaster management with Wireless Sensor NetworkMr.Anand.S.Bhosle1,,Mr.Laxmikant.M.Gavhane2.
[11] 2014 28th International Conference on Advanced Information Networking and Applications Workshops, Disaster Management Projects using Wireless SensorNetworks: An Overview, Imane Benkhelifa, Nadia Nouali-Taboudjemat, Samira Moussaoui.
[12] Managing Disaster with Wireless Sensor Networks, Nor Azlina Ab. Aziz , Kamarulzaman Ab. Aziz