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IoT based landslide prediction and prevention

1)Problem Statement

IOT based technology has the capacity of large scale deployment and real time detecting of landslide losses. IOT based network detect the slightest movements of ground or slope instability due to the several reasons such as dielectric moisture, pore pressure and so on that may occurs during a landslide.

2)Software and Hardware Requirement-

Software Requirement-

Web Application

❖ Cloud

Server A cloud server is a logical server that is built, hosted and delivered through a cloud computing platform over the Internet. Cloud server process and exhibit similar capabilities and functionality to a typical server but are accessed remotely from a cloud service provider.

❖ MQTT Protocol

MQTT (Message Queue Telemetry Transport) is an ISO standard publish-subscribe based "lightweight" Messaging protocol for use on top of the TCP/IP protocol. It is designed for connections with remote locations where a "small code footprint" is

required or network bandwidth is limited. The Message broker (MQTT) is responsible for distributing messages to clients based on landslide related data.

Hardware Requirement-

- Soil Moisture Sensor

Soil Moisture sensors measures the volumetric water contain in soil. The direct gravimetric measurement of free soil moisture require removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using the property of soil moisture such as electrical resistance, dielectric constant, or interaction with neutrons as a proxy for the moisture content.


- Vibration Sensor

The vibration sensor Detector is designed for the security practice when vibration sensor   sense vibration, it sends a signal to either control panel developed a new type of omnia direction detector with omnia directional detection.

- Gyroscope/Accelerometer

An accelerometer is an electromechanical device used to measure acceleration forces. Acceleration is the measurement of the change in Velocity or Speed divided by Time. The motion sensor IOT based Landslide Prevention and Detection System 10 in accelerometer used to detect earthquake. A dynamic accelerometer measures gravitational pull to determine the angle at which a device is tilted with respect to the earth. By sensing the amount of acceleration, users analyze how the device is moving
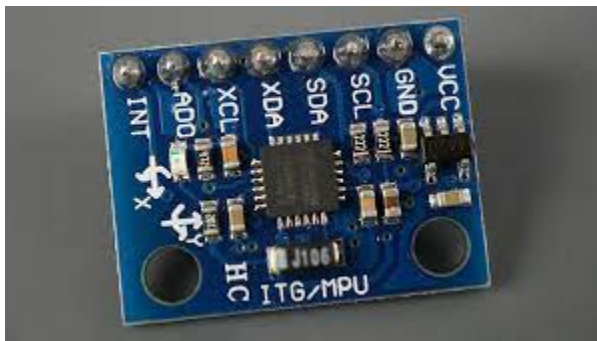
- Microprocessor

3)Additions and Updates-

Monitoring, forecasting and warning of landslide are the essential features for saving the lives and assets from devastation. There are three fundamental ways for monitoring the landslide viz, visual, surveying and instrumentation. Each monitoring technique has its own advantages, Disadvantages and application range. A landslide detection system with use of wireless sensor network can detect the slides moments of soil or slope instability due to the several reasons such as dielectric moisture, pore pressure etc. that may occur during a landslide. All this data will be sending and stored in cloud for further analysis for researchers.

4)Application, Advantages, Challenges

Application

IOT based network detect the slightest movements of ground or slope instability due to the several reasons such as dielectric moisture, pore pressure and so on that may occurs during a landslide. It gives all the information and requirements of the Landslide Detection and Prevention.

5)Conclusion

Real time monitoring of landslides is one of the challenging research areas available nowadays within the field of geophysical research. The event of an actual field deployment of a wireless device network primarily based landslide detection system.

6)References

☐ IOT Based Landslide Detection & Prevention System

Jadhav Kanchan eknath, Nalegaonkar Abhilash Dashrath, Salunke Vaishnavi Pandurang, Rajole Savita Dinkar.