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Disaster Management System

Name of the subject: **Microcontroller and its Applications ECE3003**

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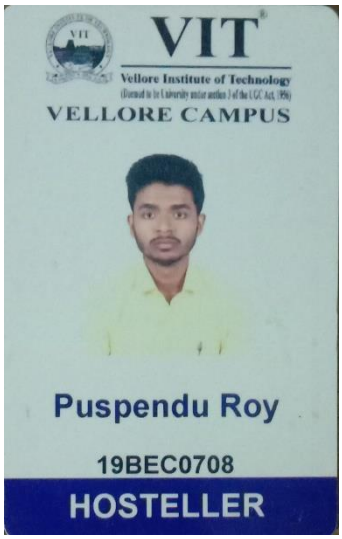

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INTRODUCTION

In Earth quake many people lose their life due to delay in the communication between the rescue team and the place where the earth quake occurs due to this miscommunication lots of people lose their lives, so we have to create a system that can provide a quick and fast communication between the rescue team and the place where earth quake occur. In recent massive earth quake which hit in Assam with magnitude of 7.5 that cause many building in Tezpur, the district headquarters of Sonitpur, Guwahati and other get break and lots of people lost their life in this earth quake .The main reason that they lost their life is due to the late communication between the rescue team and the place where earthquake occur and another reason that they lost their life is that they take precaution very late if on time they will take necessary precaution their life might be save so for that we create a system that will detect the vibration whenever earth quake come and when the value go above threshold value then it will show the indication at this particular place where earth quake come .To achieve the fast communication between the rescue team and the place where earth quake come we use gsm module to send the SMS of latitude and longitude of the position where earth quake come to the rescue team so that they can take the necessary action and provide the necessary support .

MOTIVATION

The main motivation of doing this project is the case of Assam where earth quake hit the magnitude of 7.5 and destroy many of the building. Due to this huge attack of the earth quake many of them lose their life and due to that many of them lose their source of income who have a small shop from where they get their family income and many of their loses their life due to late arrival of rescue team.

So to combat all these challenges and to alert the people before time we create a project that will alert the people whenever earth quake vibration is detect and instantly send the latitude and longitude of the affected area to rescue team so that they can come before time and save the people lives

LITERATURE SURVEY

Lots of work has been done in this field and among all of these Rahinul Hoque al.[1]they build a model with an Arduino at mega and use a ZigBee wireless network to connect with other sensor node this project getting data from various piezoelectric sensor node these piezoelectric sensor measure the vibration in terms of acceleration and pass it to different location and if these node get an data that crosses the threshold value of acceleration then it will be pass to all other area through gsm module and then in lcd they will display the message that earth quake come. But this method does not provide a very quick communication with rescue team so to provide an quick communication between rescue team so for that we build an system that will send the location of latitude and longitude to the rescue team so that they can take necessary action on it Ashutosh Gupta all.[2] in their work they detect the human being those are buried under the some heavy material they use infrared signal to detect the human presence under the heavy material such as concrete of building etc they use IR ray to measure their heart rate if the heart rate is running ,the infrared will send a signal of presence of heart rate. But this system does not alert the local people at early So that's why they did not take the necessary action to protect their life and also this will not instantly notify the rescue team to take necessary action at particular place where earth quake come Swapnil Sayan Saha .al[3] This project show the detection of gas leak and Electric fire that cause due to the earth quake .They detect these fault using a microcontroller and gas sensor but this work does not show how to alert the people whenever earth quake come and in this paper they also did not mention how to communicate with a rescue team quickly .

So due to all these draw back we proposed a system that can provide alertness to the nearby people and also send the latitude and longitude of the position to the rescue team .

BACKGROUND

As lots of lives lost due to the earth quake due to delay in providing rescue team and alert the people at the time so here in this project we have developed an system that can alert the people as well as alert the rescue team to take necessary action

In this project we use a device vibrational sensor that will detect the vibration of earth quake so whenever the value of the vibrational sensor goes above the threshold vale then it will do two things first send a signal to the 8051 micro controller then the micro controller will switch on the led to indicate that earth quake has been detected and then second it will send signal to the Arduino to

activate the GPS module so when GPS module get activated it will collect latitude and longitude of the position basically GPS help to get the location of the place in terms of latitude and longitude and then after collecting the location information Arduino will activate the gsm module and send the location information to rescue team. GSM module is used to send the SMS messages from one place to other

Emir Husni all.[4] in there research work they uses a vibrational sensor to detect the earth quake and p wave data detected by the ADXL33 sensor and send an alert signal to the nearby user this research article support our work as they are also using vibrational sensor to detect the p wave and alert the user . Sayan Saha .al[3] also uses a vibrational sensor in there work to detect the earthquake and prevent all the hazardous that has been caused due to electric fire gas leakage etc at the time of earth quake This thesis also support our work and modification we hade in our work is that quickly inform the rescue team for rescue operation

OBJECTIVE

The main objective of this project is to make the communication fast at the time of natural disaster such as earth quake so that the people who get affected from this earth quake can get all the facility quickly so that their life will be safe

Second objective of this project is to alert the people of nearby places where earth wake come so that they will take necessary precaution such as if they are using lift they come down to the ground floor and sit under the table if someone using the lift then they should stop the lift and quickly come to the ground floor.

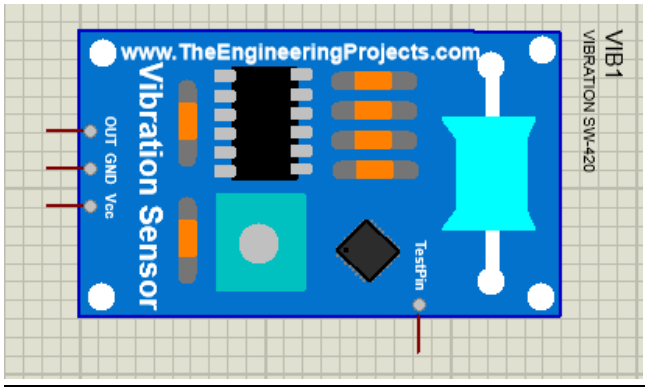
PROJECT DESCRIPION AND GOAL

The goal of this project is to alert the user at the time of earth quake and instantly call the rescue team for the help

In this project we have used two micro controller one is 8051 and another one is Arduino. 8051 microcontroller is used to alert the people whenever earth quake come by blinking the led and another micro controller arduino is used to send the location information of the affected area to the rescue team

TECHNICAL SPECIFICATION

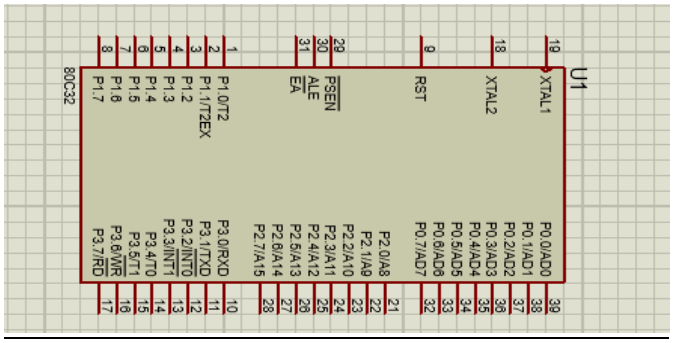
VIBRATIONAL SENSOR



The **vibration sensor** is also called a piezoelectric **sensor**. These **sensors** are flexible devices which are used for measuring various processes. This **sensor** uses the piezoelectric effects while measuring the changes within acceleration, pressure, temperature, force otherwise strain by changing to an electrical charge

IT is used to detect the vibration of the earth if the vibration crosses the threshold value then it will send a signal to 8051 microcontroller to turn on the led and it will also send a signal to Arduino to activate the GPS module and GSM module to send the location of latitude ands longitude to railway authority

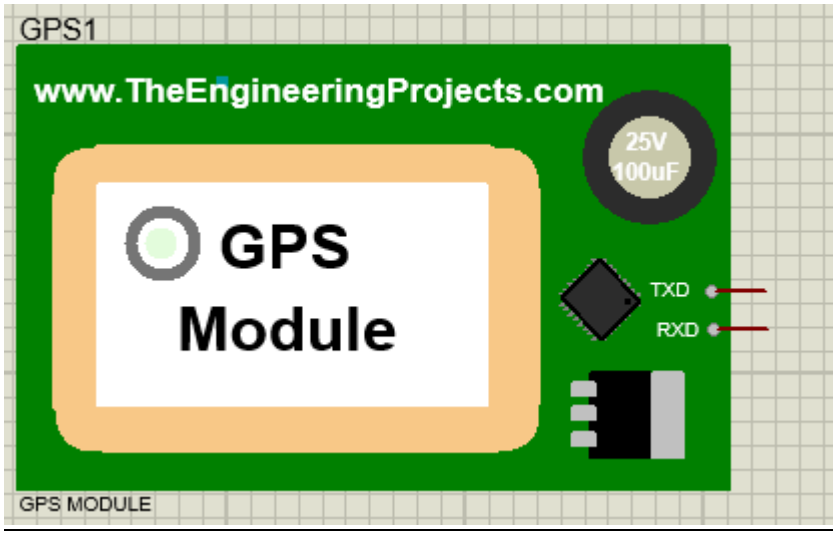
8051 MICROCONTROLLER



8051 microcontroller is designed by Intel in 1981. It is an 8-bit microcontroller. It is built with 40 pins DIP (dual inline package), 4kb of ROM storage and 128 bytes of RAM storage, 2 16-bit timers. It consists of are four parallel 8-bit ports, which are programmable as well as addressable as per the requirement.

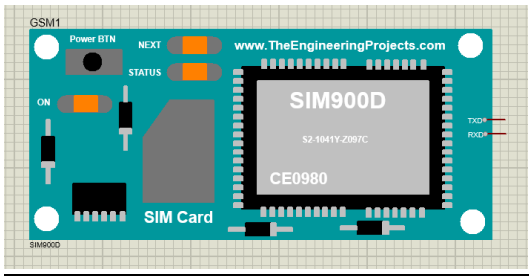
8051 microcontroller is used to receive a signal from the vibrational sensor to switch on the led whenever it will get the signal from vibrational sensor.

GPS MODULE



GPS receivers are generally used in smartphones, fleet management system, military etc. for tracking or finding location. Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. GPS is also known as Navigation System with Time and Ranging (NAVSTAR) GPS.GPS receiver needs to receive data from at least 4 satellites for accuracy purpose. GPS receiver does not transmit any information to the satellites. This GPS receiver is used in many applications like smartphones, Cabs, Fleet management etc. Whenever it get signal from Arduino it will be activate and get the location of the position

GSM MODULE



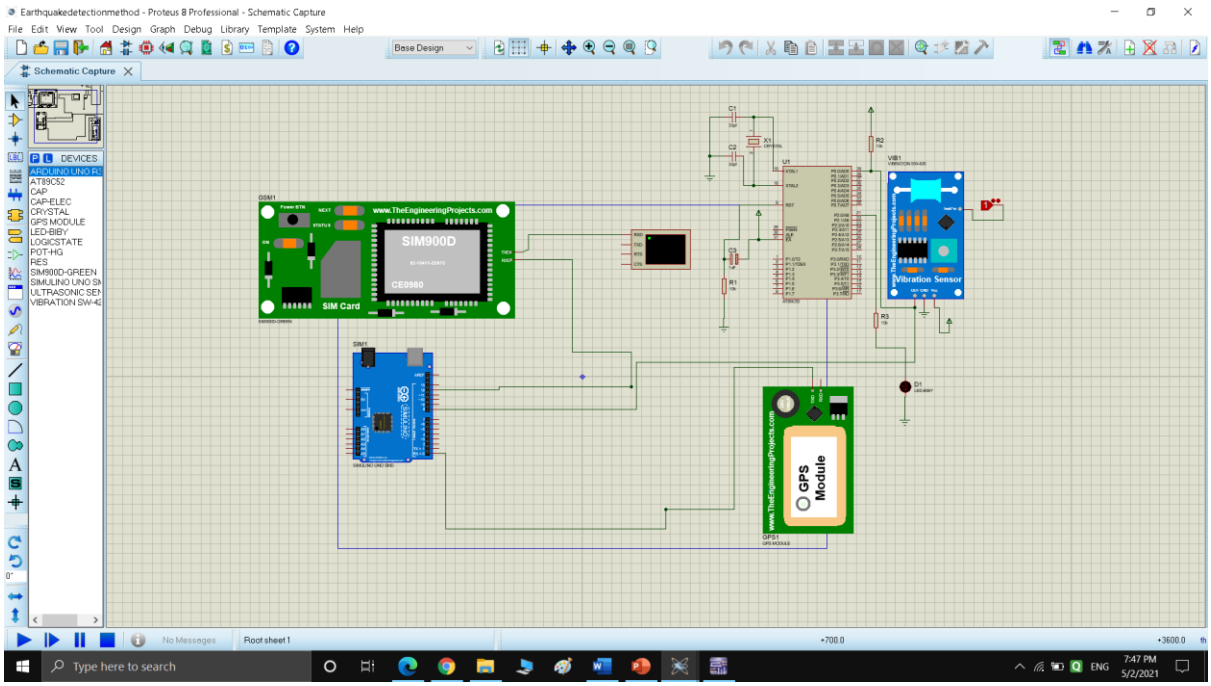
A GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system

With the help of this GSM/GPRS Module, we can do the following tasks.

- ❑ Make, receive or reject voice calls
- ❑ Send, receive or delete SMS messages in the SIM Card
- ❑ Add, read and search the contacts in the SIM Card
- ❑ Send and receive data to / from the GSM/GPRS Network through GPRS

GSM module is used to send the SMS of the location where earth quake is detected

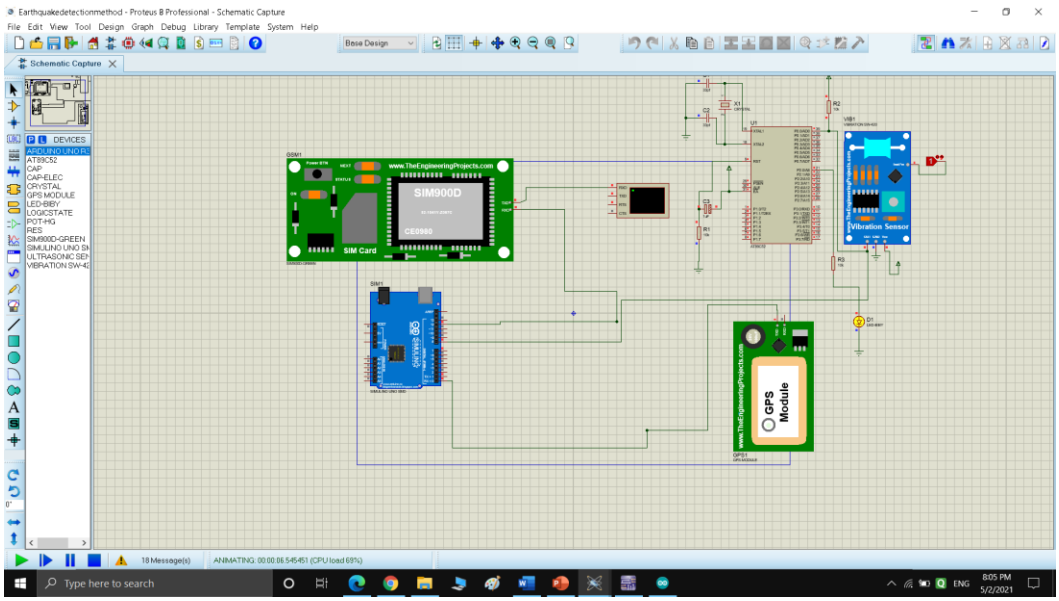
DESIGN APPROACH



In the model 8051 is connected with vibrational sensor so whenever vibration sensor value goes above the threshold value then it will send a signal to 8051 microcontroller pin at port P0.0 and then 8051 will set the port P2.0 to be high where led is connected then this vibrational sensor also send signal to Arduino when Arduino revived signal from the vibrational sensor then it will activate the GPS module which is connected at pin number 0 that is Rx of Arduino board after getting the location data it will activate the GSM module which is connected at the pin 12 to send the message to rescue team

PROJECT DEMOSTRATION

When an earth quake come led will start to blink



A message of location through GPS will be sent through gsm module to rescue team that earthquake detected at given position

Virtual Terminal

```
AT+CMGF=1
OK
AT + CMGS = "+91xxxxxxxxxx"
Eath quak detected at the given location
Latitude = 30.240455 Longitude = -97.817710
```

INDIVIDUAL CONTRIBUTION

Puspendu Roy:

Role in the project was to work with the 8051 microcontroller and the vibrational sensor. Research about the working of the vibration sensor the circuit and the pin details and the pin diagram of the 8051 microcontroller. Responsible for writing the code for interfacing the vibrational sensor with 8051 microcontroller and forward the message ahead to the Arduino to activate the GSM and GPS module.

Ayush Ranjan:

Role in the project was to work with the GPS module. For Researched about the working of the GPS module the circuit and the pin details and the output format of the message received by the GPS module. Responsible for writing the code for interfacing the GPS module with Arduino and forward the message ahead to be displayed using the GSM Module.

Merwin Sankar JS:

Role in the project was to work with the GSM module. Researched about the working of the GSM module the circuit and the pin details, AT commands and ways of passing the SMS. I was responsible for writing the code for interfacing the GSM module with Arduino and send the message of GPS module to a virtual terminal.

CONCLUSION

In this project we created a system that will detect the earth quake and alert the nearby people So that lots of people life can be save and they can take necessary action that is required at the time of earth quake

It also provide an fast communication between the rescue team and the place where earth quake detected whenever earth quake crosses a threshold value then it will send a signal to Arduino to send the location detail to the rescue team .So that rescue team can take necessary action to protect their life

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