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Magnetic Levitation Building Preventing from Earthquake

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ABSTRACT: Earthquakes are unprecedented natural calamities that can cause negative effects on both our properties and lives. An earthquake (also known as a quake, tremor or temblor) is the shaking of the surface of the Earth, resulting from the sudden release of energy in the Earth's lithosphere that creates seismic waves. The earthquakes can wipe out many buildings in a same place with its effects on ground. The mankind has faced many challenges in its evolution. This little play of mother earth is also to make us smart to understand her. Our project deals with the magnetic levitation effect to save building at the times of earthquakes.

I. INTRODUCTION

EARTHQUAKES, which often cause serious casualties and property damage are considered major disasters since they can destroy buildings and greatly affect human lives and environments.

An earthquake causes random movements of the ground, in all possible directions emanating from the epicentre. It is always accompanied by a horizontal vibration of the ground. The vibration of the soil vibrates the structures that rest on the ground, developing forces of inertia in the structure. As the earthquake changes direction, it can cause stress reversal in the structural components, that is, tension changes to compression and vice versa. An earthquake can generate large stresses, which can lead to large deformations, cracks and drifts, making the structure is not functional and unusable. The social, structural and economic damages caused due to an earthquake can be vastly reduced by preparing for such a calamity since earthquakes are almost unpredictable. From the engineering point of view, to prevent loss of life and property damages due to earthquakes, buildings are to be designed as earthquake resistant structures. In conventional systems, seismic energy is dissipated using inelastic mechanisms like flexural and shear hinging of elements like beams, columns and walls, axial tension yielding, brace buckling etc.

A consensus has been reached that more than 90% of all earthquake casualties are caused by the collapse of buildings. Therefore, studies on the impact of earthquakes on buildings have continued; these studies have focused on topics such as earthquake risk assessment of buildings post-earthquake building damage assessment and collapse prevention of buildings.

At present, the structures and facilities in most countries, including China, are mostly composed of concrete since it boasts a wide range of composite materials, low cost, high compressive strength, fire resistance, resistance to weathering, and low maintenance cost. However, its tensile strength is poor and consequently cracks easily. Surface cracks on buildings represent the accumulation of damage during normal use, but they are also external manifestations of a certain degree of danger. The characteristics of fractures reflect the current working and structural status of the building facility. That is, if the value of a structural fracture on a building exceeds the safety threshold, it will not only

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affect the aesthetics and durability of the building but also endanger the safety of people within and the surrounding property. Therefore, the information contained within building cracks is critical for the early warning of structural instability.

II. LITERATURE REVIEW

Water is one of the most important substances on earth. People now days always want something that can make their life easier. In this thesis is used to define the water monitoring systems such as Tank water level sensing monitoring, water pollution monitoring and water pipeline leakage sensing monitoring. By using Wireless Sensor Technology we avoid the huge amount of water is being wasted by uncontrolled use of large apartments/offices. The microcontroller (PID) based Water level monitoring is used to indicate the level of water in the tank to agent. Sensor Based Water Pollution Detection, it will check the water quality by using these parameters such as the pH level, turbidity and temperature are measured in real time by the sensors and it will monitoring by an agent. Leak detection in water pipelines, we use the pressure into the pipe using on force sensitive resistors (FSR) generated from a leak is detected, it will be indicated by an increase in the LED meter and a rushing sound will be heard in the headset. This thesis our motivation is to prevent the water by using technologies and the monitoring system uses daily life device like laptop or mobile phone.

An extremely growth in an industrial and infrastructural frameworks creating environmental affairs like atmospheric changes, malfunctioning and pollution. Pollution is becoming serious issue so there is need to build such a flourishing system which overcomes the problems and monitor the parameters that affecting the environmental pollution. The solution includes the technology Internet of Things (IOT) which is a hook up of computer science and electronics. It can provide means to monitor the quality of environmental parameters like Air, Noise, Temperature, Humidity and light. To monitor pollution levels in industrial environment or particular area of interest, wireless embedded computing system is proposed. The system is using a prototype implementation consists of sensing devices, Arduino uno board, ESP8266 as Wi-Fi module. These sensing devices are interfacing with wireless embedded computing system to monitor the fluctuations of parameters levels from their normal levels. The aim is to build powerful system to monitor environmental parameters.

III. WORKING PRINCIPLE

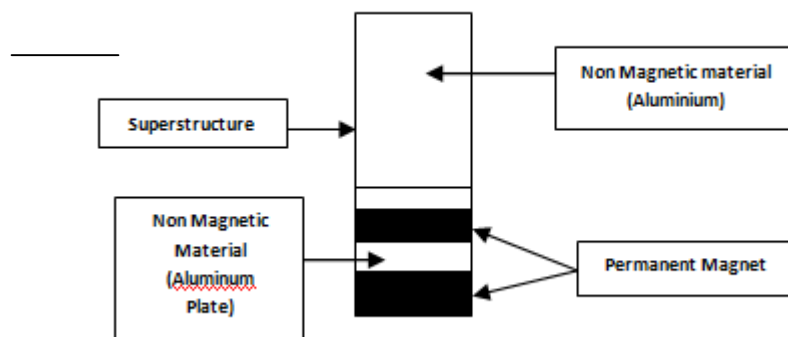


Fig no: 4.1

In this project we can use ARDUINO UNO as main controller monitoring the vibration sensor and pressure sensor level and controlling air pump with the help of solenoid. Here using 5v solenoid as relay if vibration sensor detected a abnormal vibration level above the normal vibration the solenoid will be activated and air pump also triggered. So air flow will be send to pneumatic piston it will release the building and magnetic repulsion building will

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be lifting in magnetic force so vibration is reduced. After vibration sensor is normal data will send ARDUINO UNO will be activate solenoid and air pump triggered so the pneumatic piston will return to normal position.IOT will monitoring an all the data and storing in cloud. LCD will monitoring in all the vibration sensor and solenoid activated or not condition.

An electric current to generate a magnetic field and thereby operate a mechanism which regulates the opening of fluid flow in a valve. Solenoid valves differ in the characteristics of the electric current they use, the strength of the magnetic field they generate, the mechanism they use to regulate the fluid, and the type and characteristics of fluid they control.

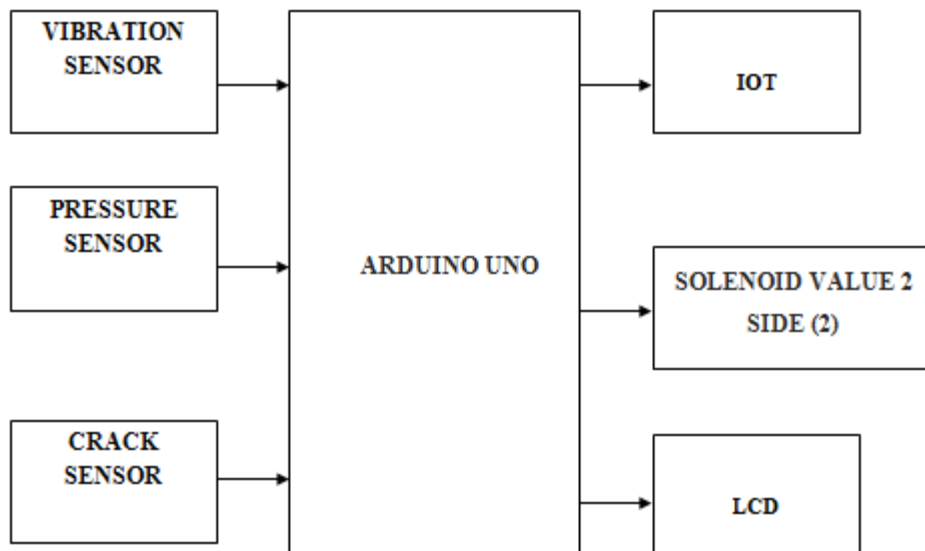


Fig no:4.2

IV. HARDWARE DESCRIPTION

- A. **Arduino UNO:** Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 Analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.
- B. **VIBRATION SENSOR:** Vibration sensor usually at any angle switch is ON state, by the vibration or movement, the rollers of the conduction current in the switch will produce a movement or vibration, causing the current through the disconnect or the rise of the resistance and trigger circuit. The characteristics of this switch is usually general in the conduction state briefly disconnected resistant to vibration. It is briefly the buzz film used in the conventional alarm device, the complex structure of the magnet plus the spring, and thus on the electric car alarm in recent years extensive application.

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- C. **PRESSURE SENSOR:** A pressure sensor measures pressure, typically of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed
- D. **LCD(Liquid Crystal Display):** LCD screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. The data register stores the data to be displayed on the LCD.
- E. **SOLENOID VALVE:** A solenoid valve is an electromechanical device in which the solenoid uses Electric current to produce magnetic field and thereby operate a mechanism which regulates the opening of fluid in the valve.

V. PROPOSED SYSTEM

The main motive of our paper is to introduce an idea that can help to ease the way to protect from earthquake. In this project we can build an building in two repulsion magnetic base levitating building. Here LCD is used to show user how the crack and earthquake level. There is a control earthquake vibration with wall and floor crack detection. It is cost effective. So everyone can afford it.

VI. CONCLUSION

Comparing with collection and forwarding information or data of traditional base station (gateway), this system has low-cost, low power consumption, and easy to maintain. This paper designs a wireless sensor network system using microcontroller as a base station, sensor node as combination of sensors. Hence, we can create sensor-logging application, location-tracking applications, and a social network of things with status updates, so that you could have your location parameter control itself based on your current location. One major advantage of the system lies in the integration of the gateway node of wireless sensor network, database server, and web server into one single compact, low-power, credit-card-sized computer, which can be easily configured to run without monitor.

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