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Paper Authors

**S. Raja Sekhar , R. Krishna Sai, Sk.Sameer, Y.V.N.Tulasi**



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## Iot Based Self Protection Bed From Earthquake

\*S. Raja Sekhar , \*R. Krishna Sai, \*Sk.Sameer, \*\*Y.V.N.Tulasi

\*B.Tech Student,Dept Of Cse, Seshadri Raogudlavalleru Engineering College

\*\*Assistant Professor, Dept of CSE, Seshadri Rao Gudlavalleru Engineering College

[Sandrarajasekhar8@Gmail.Com](mailto:Sандрarajasekhar8@Gmail.Com),

[Krishnasairamini64@Gmail.Com](mailto:Krishnasairamini64@Gmail.Com), [Sksameer429@Gmail.Com](mailto:Sksameer429@Gmail.Com), [Tulasi.Kp1@Gmail.Com](mailto:Tulasi.Kp1@Gmail.Com).

**Abstract:** Natural Calamities Like Earthquake Causes Severe Damage. When A Severe Earthquake Occurs, It Is Impossible To Escape From The Collapsed Houses Because The Residents Are Crushed There Under. Earthquake Account For The Majority Of Deaths From Range Of Natural Disasters Which Accounts To About 60,000 People A Year Worldwide, Around 90 Percent Of Which Occur In The Developing Countries. This Invention Will Be Developed In Consideration Of The Above, And An Object There To Provide An Earthquake-Proof Bed Able To Safeguard Human Beings During Sleep, Even In A Severe Earthquake. A Further Object Of This Invention Is To Provide An Earthquake Proof Bed Providing Required Facilities Such As Tools For Escaping, Food, Aradio, A First Aid Kit, Oxygen Cylinder, Location Tracker, Door That Can Be Opened Automatically Thereby The Occupant Can Rescue Himself Without The Assistance Of Other Persons.

**Keywords**– Earthquake, Human Beings, Earthquake-Proof Bed, Location Tracker, Rescue.

### 1. Introduction

The Most Well-Known Effect Of Earthquakes Is Groundshaking. It Is Caused By Seismic Waves Passing Through The Ground, And It Can Be Relatively Soft In Small Earthquakes Or Extremely Powerful In Huge Earthquakes. It's Worth Noting, Though, That While Earthquakes Kill A Lot

Of People, None Of Them Are Killed Directly By The Shaking. People Are Killed Only Because We Continue To Construct Buildings, Highways, And Other Infrastructure. It's Not The Earthquake's Fault; It's Ours.

Liquefaction And Subsidence Of The Ground Are Significant Impacts That Are Frequently The Source Of Significant Damage In Earthquakes, Especially In Unconsolidated Lands.

When Sediment Grains Are Literally Made To Float In Groundwater, The Soil Loses All Of Its Firmness, Which Is Known As Liquefaction. Subsidence Is A Term Used To Describe A State Of Being

As In The 1964 Niigata Earthquake In Japan, Buildings Have Tipped Over And Plunged Partially Into Liquid Soils.

Through Liquefied Soils, Underground Gas Tanks And Septic Tanks Have Been Reported To Float To The Surface.

In The 1995 Kobe Earthquake, Liquefaction And Related Impacts Caused More Than \$20 Billion In Damage, And Similar Levels Of Damage Are Likely In Us Port Infrastructure During A Big Earthquake.

Earthquakes Produce Landslides By Both Direct Rupture And Persistent Shaking Of Vulnerable Slopes. They Can Easily Damage Structures In Their Path, As Well As Obstruct Roads And Railroad Lines And Take Hilltop Residences With Them.

On Rare Occasions, Such As The Hebgen Lake Earthquake (Magnitude 7.1) In Montana On August 17, 1959, They Can Even Dam Rivers.

Following The Loma Prieta Earthquake, A Major Landslide Across Highway 17 In The Santa Cruz Mountains Occurred.

The Concrete Slabs In The Foreground Are Broken Pieces Of The Highway's Centre Barrier.

Following The Earthquake, The Road, Which Runs From Santa Cruz To Silicon Valley, Was Closed For Several Weeks.



**Fig 1. Earthquake Consequences**

## 2. Proposed System

Here Is An Idea That Incorporates A Bed System That Guard People During An Earthquake. When The Unsuspecting Resident Is Sleeping Soundly In Bed He Can't Get To Know The Situation. Usually Many Of Us Don't Know What Is Happening Around Us While In Deep Sleep. This Earthquake Survival Bed Is Made Of Strong Wood In A Shape Of Cuboid Which Looks Like Usual Bed. The Lid Which Will Be Closed Will Not Harm The Resident On The Bed, Because The Bed Will Be Maintained At Certain Height. In The Aid Chamber, The Person Can Self-Rescue By Using Sensors To Open The Door And Get Out Of Bed Without The Assistance Of Other Persons.

- Includes

The Adxl345 Is A 3-Axis Mems Accelerometer Module With I2c And Spi Interfaces That Is Low-Power.

These Modules' Adafruit Breakout Boards Have On-Board 3.3v Voltage Regulation And Level Shifting, Making Them Easy To Connect To 5v Microcontrollers Like The Arduino.

The Arduino Uno Is The Perfect Board For Beginners Who Want To Learn About Electronics And Programming And It Also An Open-Source Microcontroller Board Designed By Arduino.

The Servo Motor Is A Small Yet Powerful Motor That Can Be Utilized In A Variety Of Applications, Including Precise Position Control.

A Signal From An Arduino Can Be Used To Control This Motor.

The Servo Motor Is Used In Our Project To Promptly Close And Open The Door Based On The Signal From The Arduino And The Ir Sensor.

An Infrared (Ir) Sensor Is A Type Of Electrical Gadget In Which It Determines And Calculates The Infrared Radiation In Its Backdrop.

When An Object Came Near The Sensor, The Led's Infrared Light Reflects To It And Is Acknowledged To The Receiver.

We Employ An Active Ir Sensor As A Proximity Sensor In Our Project, Which Detects Debris In Front Of The Emergency Door.

If There Are No Obstructions Or Debris In Front Of The Emergency Door, The Emergency Door Will Open, Allowing The Person Inside The Bed To Protect Himself.

A Gsm Modem, Also Known As A Gsm Module, Is A Gadget Which Connects A

Remote Network Using Gsm Mobile Phone Technology.

It Enables You To Integrate Voice, Text, Sms, And Data Into Your App. This Shield Is Designed To Be Used With An Arduino Or Other Comparable Device.

It Is Utilized In Our Programme To Send A Message To The Appropriate Number Informing Them About The Earthquake's Occurrence And Its Default Position, Which Was Already Saved In The Code.

## **2.1 working Procedure:**

Here Is An Idea That Incorporates A Bed System That Guard People During An Earthquake.

When The Unsuspecting Resident Is Sleeping Soundly In Bed He Can't Get To Know The Situation. Usually Many Of Us Don't Know What Is Happening Around Us While In Deep Sleep.

This Earthquake Survival Bed Is Made Of Strong Metal In A Shape Of Cuboid Which Looks Like A Usual Bed. Even We Can Use Wood Instead Of Metal. If We Use Cypress Wood From 30-40 Years Old Tree It Can

Resist 59 Metric Ton's Of Falling Debris And Can With Stand 65 Tons Of Weight.

The Lid Which Will Be Closed Will Not Harm The Resident On The Bed, Because The Bed Will Be Maintained At Certain Height.

This Invention Was Developed In Consideration Of The Above And Objective There To Provide An Earthquake proof Bed Able To Safeguard Human Beings During Sleeping, Even In A Severe Earthquake.

The Way It Works Is--When An Earthquake Hits, Sensors In The Bed Detect The Ground's Movement And Then, A Lid Shuts The Top, Protecting The Occupant Even If The Building Collapses. This Mechanism Will Be Done By A Vibrating Sensor Which Provokes The Arduino To The Movement

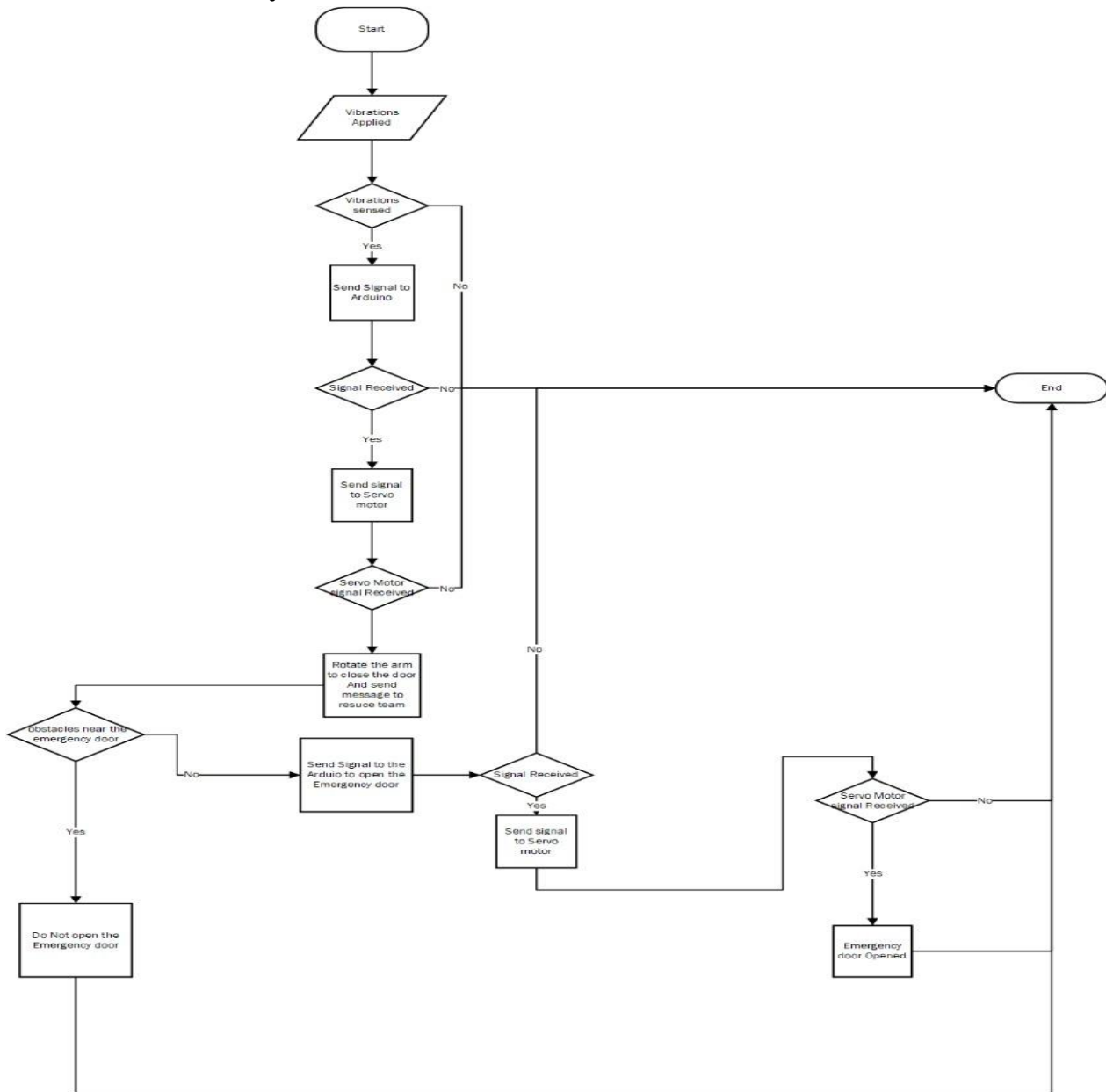
Then The Servo Motor Will Be Activated By The Arduino To Close The Lid Which Is Attached To The Bed By Using Gravity. We Make Sure That The Door Is Strong Enough To Resist Collapsed Roofs Of Building.

Usually, They Have A Servo Arm Can Turn 180 Degrees. Using The Arduino, We Can Tell A Servo To Go To A Specified Position And It Will Go There As Simple As That.

Gsm Module Is Used To Send The Alert Message To The Respective Rescue Department With A Default Location Registered.

And Then We Have An Ir Sensor Which Is Used To Detect The Objects Near The Door There By The Occupant Can Rescue Himself Also Without Depending On Others. Ir Sensor Will Be Assisted By Another Servo Motor To Open The Door.

## 2.2 workflow Of The System:



**Figure 2. Flow Chart Of Working Of Self Protection Bed From Earthquake**

## 3. Result And Conclusion:

Irreparable Damage Being Caused In Nepal, Myanmar, Afghanistan, China.

### 3.1 result

We've All Been Scared Of An Earthquake Destroying Life As We Know It. Even More So Now, With The Recent Incidents Of

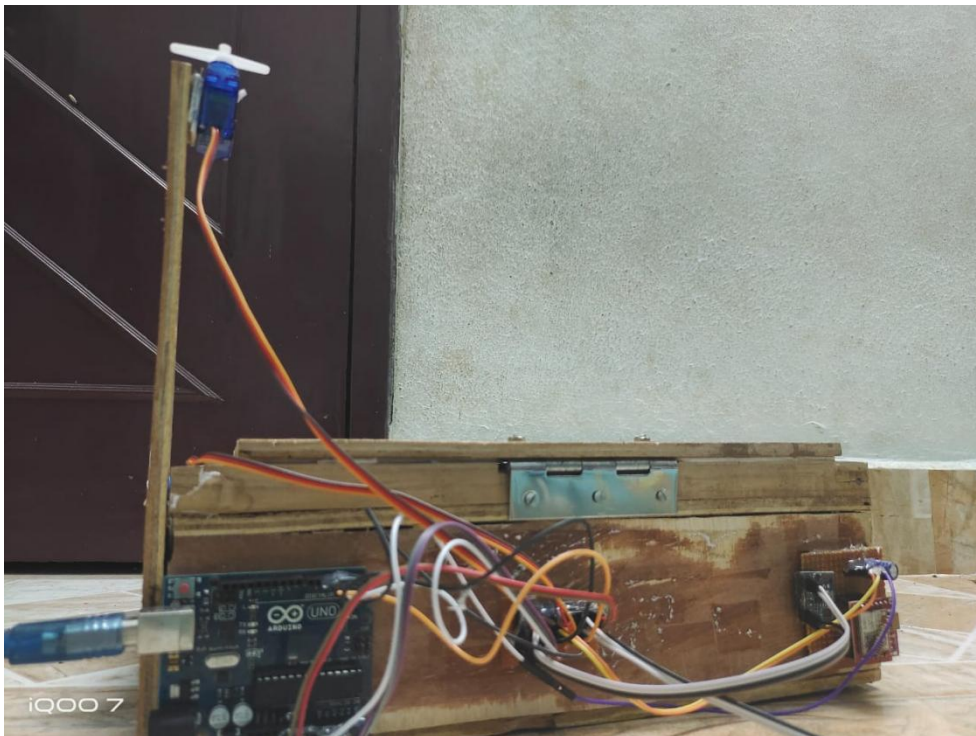
However Irreparable That Damage Might Be, When The Earthquake Actually Hits, All

One Wants To Do Is Save Themselves And Their Loved Ones.

In An Effort To Make People In High-Seismic Zones Sleep Better, We Come Up With The Design And Plan To Create A Bed That Can Protect Its Sleeping Owners By Folding Them Up In A Steel/Wooden

Box When The Earthquake Hits.

And That's Not All. The Box The Occupant Will Be Kept Safe In Will Also Be Stocked With Food, Bottled Water, First Aid And Even Gas Masks Called Aid Chamber--In Case Help Arrives Late.



**Figure 3. Hardware Setting Of The System**

When The Earthquake Occurs A Message Will Be Sent To The Rescue Team, For The Rescue Of The Incumbent.



3-5 11:07 AM

Alert  
Earthquake occurred  
at Gudlavalleru  
rescue required



Text message



**Figure 4. Alert Message**

### 3.2 Conclusion:

With This Project, We Can Save People Who Is Unconscious When They Are In Sleep. Although We Can`T Save Every Person, We Can Save At Least The People Who Are Sleeping On This Bed. Even Though Our Project Might Not Seem To Be Effective As A Prototype When It Comes To Production Or A Business Purpose It Can Serve Better. Even Though It Costs High It Can Save A Life.

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