

Trussworthy

Vibration anomaly detector



IOT Based Automatic Crack Analysis For Structures Using Vibrations

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Overview

- ▶ Concept
- ▶ Purpose
- ▶ Materials Used
- ▶ Research Method
- ▶ Results
- ▶ Future Scope



Concept based on:

- ▶ Natural Vibrations of Structures on application and movement of Load over It.
- ▶ When cracks develop in a structure the rate and magnitude of vibrations changes linearly and we tap into this energy to detect structural damage.





BUILDING COLLAPSE

Across India 2600 people die every year in building and other structural collapses

At least 20 people died in two separate building collapses in Delhi and Chennai on Saturday. Across India, the annual figures are even more appalling.



Lightshot Screenshot

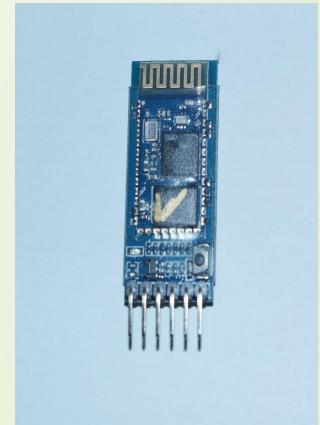
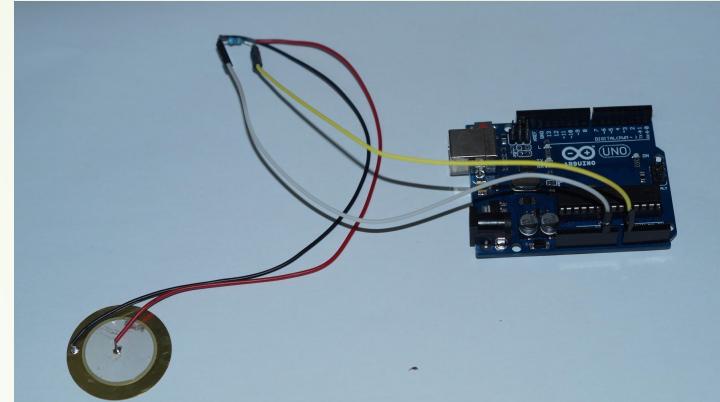


Aim:

- ▶ Structure Maintenance and Proper warning signs towards unstable structures
- ▶ Early and quick reaction from the maintenance teams
- ▶ Proper Recorded data of structural stability and durability

Materials used

- ▶ Piezo Electric Sensors
As Vibration sensors
- ▶ Bluetooth Module
- ▶ An ARDUINO
- ▶ LED(red) and Buzzer



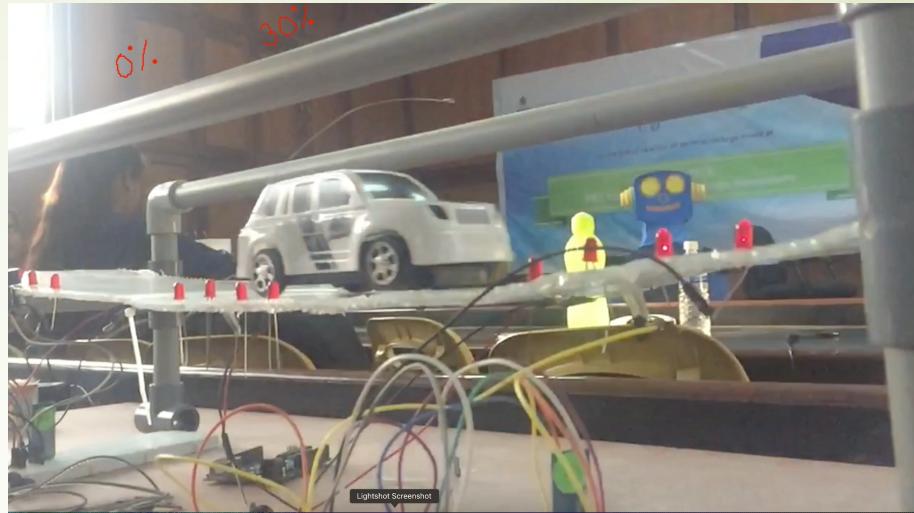
METHOD

Developed a miniature bridge of moderate structural strength with piezo sensors attached to it and used a remote controlled toy car as the moving load

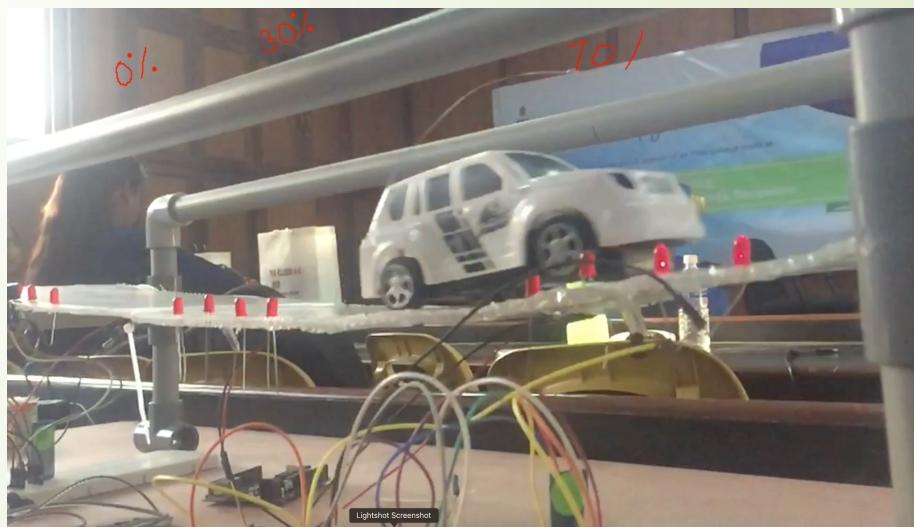
- ➡ This is phase 1 where the road has 0% deformity.



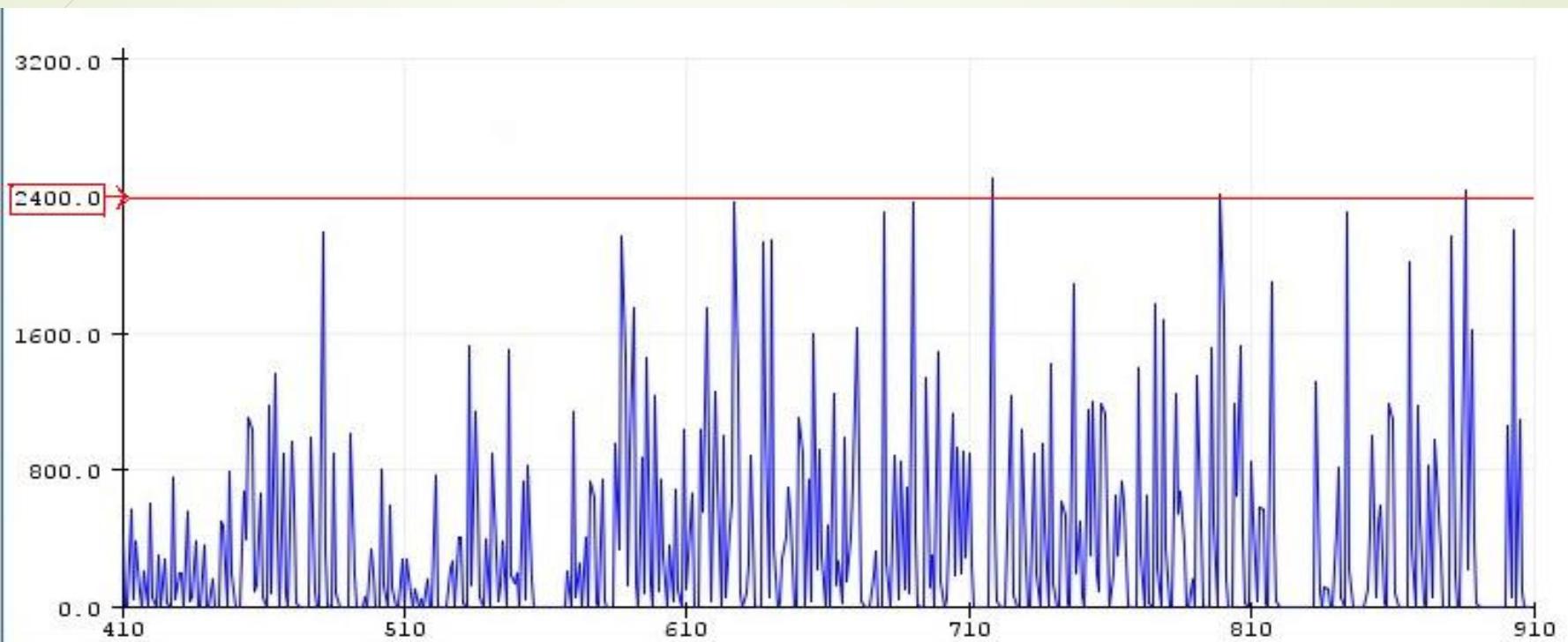
► This is phase 2 where the road has 20 % deformity



► This is phase 3 where the road has approximately 50% deformity



Results



Text Message
Thu, 1 Mar, 11:54 PM

bridge in danger

bridge in danger



What's next?

- ▶ Moving this device into a self sustaining environment
- ▶ Develop a computer application to upload a global data sheet for every structure using this device.