

Bridge Disaster Monitoring & Alert System

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Abstract: Structures, including pipelines, aircraft, ships and civil infrastructures, such as bridges, buildings, dams, among others, are major parts of society's economic and industrial success. Bridges are one of the critical cross points of a country's transport network but they are expensive to build and maintain. It is basically imperative to keep connect harms from regular debacles, for example, hurricane surge, seismic tremor, and so on. As needs be, the consideration on water powered brought about scaffold disappoinment has been gotten because of scour issues. In any case, in-situ connect scour observing is still one of the rough works for analysts in their field applications. It is important to guarantee that the scaffold checking framework under normal fiascos can work well. By sending cautioning signals, the ongoing data can give designers to settle on right choice and take fitting activities in time while the extension harm happens. This review connected the inventive scour observing procedures which have been outlined and created in the research facility, and can be introduced and tried in the field. An inventive remote sensor systems was additionally utilized to build the scaffold observing framework with fluctuated sensors.

Keyword: ARM1, GSM2, Sensors3, ZIGBEE4, assembly language5 etc.

INTRODUCTION

Connect condition observing frameworks prompts to the capacity of security support and expanding the life time of ongoing extensions. Long haul connect condition checking framework have been executed to give secured and wellbeing operation. Notwithstanding that it likewise gives the usefulness of an early caution on the harm of the extensions. The current advancement of scaffold observing predominantly concentrate on the uncommon structure and transmitted and defenseless part of the extension. The innovation of remote sensor system and exploits the qualities of numerous jump hand-off to scatter ecological information. Moreover, it makes utilization of sensor hubs as a reinforcement plan of extension observing. For short separation (among sensors in the scaffold) is utilized GSM system, and GSM is utilized for long separation (between the extension and the administration Center) information correspondence. This innovation can be called MBM (Monitoring Based Maintenance) that empowers the extension support engineers screen the state of the scaffold progressively. The sensors introduced on different parts of the extension as appeared in Fig. screens the twist, shaft supportability, weight of the vehicles and so on. Anytime of time if any of these parameters cross their limit esteem the correspondence framework advises the administration focus giving an alert for taking prudent steps. The correspondence built up between the middle of the road module and the database focus is utilizing GSM innovation.

LITERATURE REVIEW

According to with the assistance of the remote innovation numerous issues because of information links and costly optical link are presently minimized and disposed of.

Sensor and ZIGBEE module joined gets to be u-hub (omnipresent hub). ZIGBEE is turned out to be fabulous arrangement in short separation remote information correspondence. For long separation information exchanging CDMA which is a cell phone transporter arrange in Korea is utilized rather than optical link which is costly in establishment and support.

A multi-useful remote scaffold observing framework has been created for simultaneous arrangement of accelerometers, strain transducers, and temperature sensors. The mixture detecting capacities of these hubs fulfills the prompt necessities for financial, low upkeep stack evaluations and fleeting element estimations notwithstanding giving the equipment usefulness to improvement of a long haul ceaseless scaffold checking framework.

3. Adjustment This framework incorporates the GSM module for long and short separation remote information correspondence which is cell phone transporter arrange [1]. This framework additionally utilizes four sensors and interface LCD (Liquid Crystal Display) for showing yield of all sensors.

4. Innovation Development of (Sensor + GSM module). The yield information from the sensors are in a type of voltage, or resistance, or heartbeat relying upon the sort of sensors. The tactile yields are simple information which should be changed over into computerized frame. An A/D converter for every sort of sensor is produced in this exploration work. In this way, the A/D converter peruses simple information from the sensor and conveys the information to the GSM module which sends the information to other the GSM modules remotely Asensor module with the A/D converter and GSM module is called u-hub. Advancement of USN (Ubiquitous Sensor

Network) The term USN (or remote sensor system) is a blend of the remote correspondence system and sensor innovation. Sensors and system modules are consolidated into one unit, which regularly called universal sensor, and correspondence organize conveys sensor information remotely. Accelerometer sensor can gauge level of speeding up where it is mounted. For temperature detecting here we utilize thermometer LM35 sensor. To quantify strain here utilizations Load Cell which change over a constrain into electrical flag. Anemometer is utilized to quantify the wind speed.

BLOCK DIAGRAM OF SYSTEM:-

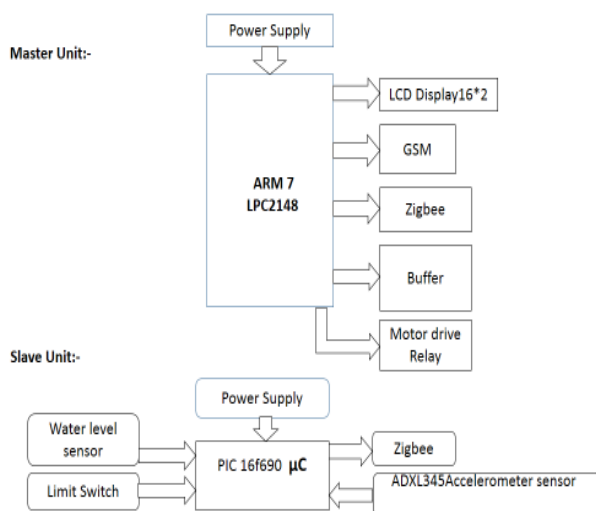


Fig.1 Block diagram of system

WORKING OF BLOCK DIAGRAM:

In this venture we will utilize one master unit and no of slave units all sensors which will use to detect connect crumple (constrain switch) and waterway water level are associated with slave unit. The point of confinement switch here use in a scaffold fall sensor by sense the any harm of extension and send the information to microcontroller. Water level sensors are joined to over the extension. The water level goes to an above scaffold then these sensor send the data to a controller and to the ZIGBEE through send data ace mode and after that the extension entryway will be naturally shut.

Accelerometer sensor is pronounce the any twist on steel in scaffold concrete. By utilizing ZIGBEE module all slave units speak with ace and information will show on LCD show of ace unit. Master unit comprise of LCD show which show contrast parameter or status of all sensors of slave unit them GSM module. GSM modules are send the back rubs in individual designer and emergency vehicle. Here PIC 16fXXX microcontroller we'll utilize it is 20 stick IC having one UART to speak with GSM ZIGBEE.5v and 12v power supply is required to run an entire venture. On the off chance that extension fall distinguishes by utilizing unit switch or stream water level change. The security level them cradle will blow &GSM

will send SMS to educate about that change to control room.

BRIDGE TEST BED PROTOTYPE:

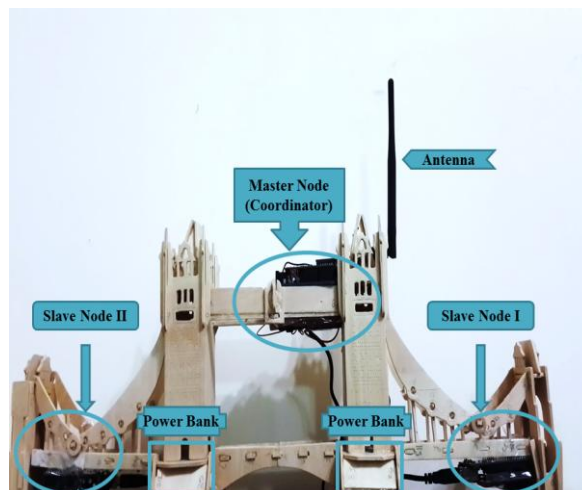


Fig. 2 Bridge test bed prototype

A scaffold model was implicit the research facility environment as appeared in Fig. Since the two slave hubs are mounted in two basic areas on the scaffold, this has an additional benefit for offering an extensive variety of gathered information. For the field test, the goal was to utilize our proposed framework to screen constant extension temperature and increasing speed of the structure to discover its last status then ready customers through electronic application.

SYSTEM ARCHITECTURE:

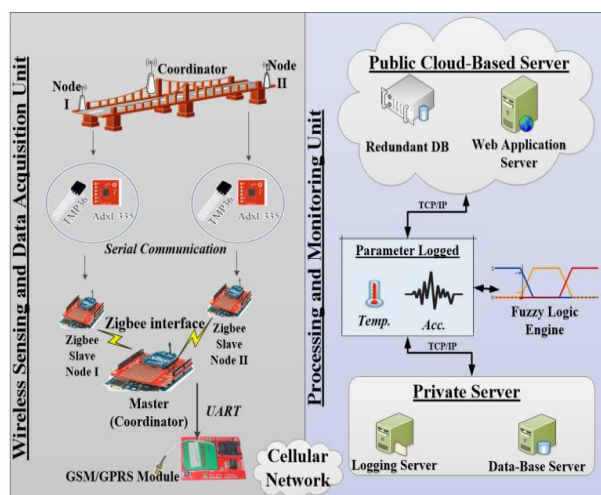


Fig.3 Overall system architecture

SYSTEM HARWARE BASIC BUILDING BLOCKS:

To plan a remote checking framework for expressway spans, useful and non-utilitarian prerequisites ought to be indicated. For instance, the framework ought to utilize cost full of feeling off-the-rack segments, a two ways remote interchanges, Google maps to show the extension's



ongoing status and a capacity gadget for authentic database. The framework ought to likewise be anything but difficult to work and keep up, send early warning signs to the administrator cell phones and the checking station. To fulfill the above prerequisites, the proposed equipment framework must have two primary units: a) remote detecting and information acquisitions unit b) handling and checking unit. A square graph of the proposed framework is displayed in Fig. 2.

BRIDGE DATA ACCUSATIONS SYSTEM:

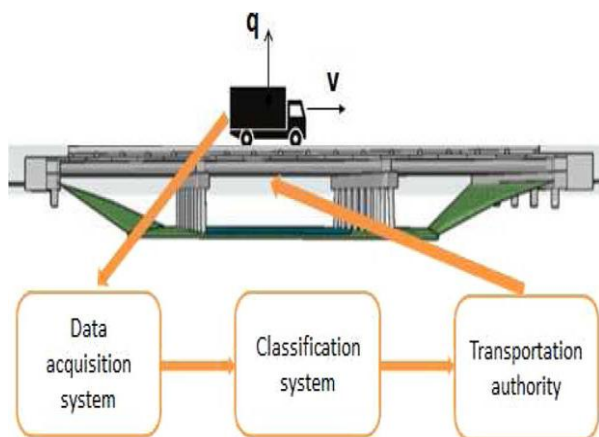


Fig.4 bridge data accusations system

Fig. shows the indirect bridge structural health monitoring system. Acceleration signals are collected from a moving vehicle and sent to a classification system, which identifies the bridge status and reports it to a transportation authority.

Acceleration signals collected from existing structures are often non stationary and have relevant information that is present in localized time-frequency regions; long-term behavior such as the natural frequency and the harmonic frequencies can be observed in the frequency domain, while the short-term behavior such as bumps and local roughness can be observed in the time domain. It is well known that multi resolution techniques, such as wavelets, are suited to the analysis of such signals, allowing for signal-adapted decompositions.

ALGORITHM:

1. Start
2. Initialized on LCD
3. If movement is Occur
4. Sensor
5. Display On LCD
6. Closed Gate
7. Alarm
8. Send SMS

FLOWCHART:

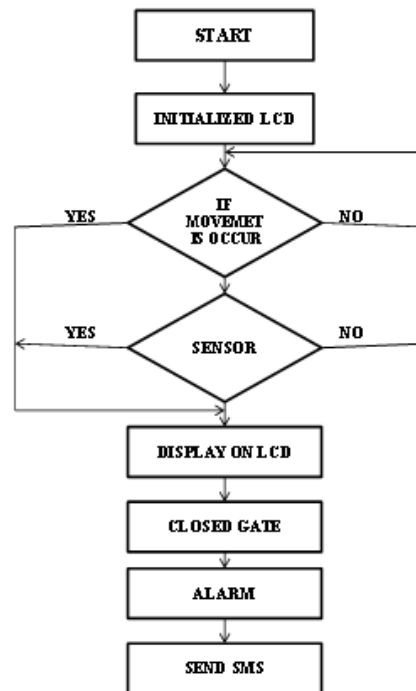


Fig.5 flowchart

ADVANTAGES:

1. Improved understanding of structural behavior.
2. Early damage detection.
3. Assurances of a structure’s strength and service ability.
4. Improved maintenance.
5. Multi Sensors are used for detecting the different disaster.
6. Better accuracy in result.

APPLICATIONS:

1. It is used to find out the mechanical strain on the bridge.
2. It is used Long-term health.
3. It can be used for structural health, bridge safety, damage detection.
4. It can avoid accidents caused by the extreme weather conditions.
5. It is useful for monitoring the faults of bridge occurred.
6. Quickly alert the people.
7. It also use in building collapse.

CONCLUSION

In this venture, a financially sarvy and ongoing observing procedure is embraced to follow the scouring profundity of scaffold heap establishment. A basic mechanical rule consolidated with a computerized I/O switch frames a scour-detecting gadget. This strategy has focal points of constant disturbing and little calculation, which gives a productive and viable calculation for ongoing disturbing of outrageous occasions in auxiliary wellbeing observing.



The framework used ZIGBEE based information securing unit, a GPRS correspondence arrange and a fluffy rationale calculation. The reproduction and the real continuous outcomes were coordinated with adequate blunder that did not adjust the wellbeing status of the extension.

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