ABSTARCT

Structural Health Monitoring is an important factor arising in the technological world. In the existing there is no adequate method for ensuring whether the bridge is safe for traveling or not, there are only assumptions that the bridges are safe for traveling. The proposed Bridge Healthy Monitoring System is one of the concepts of structural safety monitoring system. In this project we can ensure the safety and health of a bridge and make it known to the public that it is in the best condition to be used. There will be databases to store the collected values. These collected values can be used for monitoring and surveillance. This data can also be used for future reference and further a developed system used for predicting the arising problems which may or may not happen. A further system may be able to predict the occurrence of accidents and take measures to reduce them. These days there are recent issues of bridges collapsing due to lack on time monitoring. This problem can be avoided using this project prototype.

INTRODUCTION

Bridge Healthy Monitoring System offers an on-time surveillance and monitoring of a bridge. Bridges connect lands and make transportation possible which makes it an important feature of transportation. As importance of bridges increases the reasons to ensure safety of the bridge also increases.

Thus, this project gives a solution to reduce the problems in the construction and management of a bridge based on IoT. In the current system there are no accurate method to ensure the safety of the bridge. And the public is not aware of the conditions of the bridge which they are using daily. In the present situation we can only know the condition of the bridge after an accident take place.

The developing system provides an overall monitoring and surveillance of the bridge. Several sensors are used to detect the conditions of the bridge, these sensors can be also used to detect the changes in environmental conditions. The structure of the bridge may vibrate under the action of moving vehicles, earth quake and flood conditions. All these collected data can be used for bridge safety management in occurrence of a disaster and disaster rescue. In further analyses these data can also be used to predict certain accidents and will be able to avoid them. In the existing system there are only a few numbers of factors to ensure the safety of the bridges. And some of these factors are purely natural which are hard to control. These can only be predicted and prevented up to a certain amount. Human life and property will be in a severe situation when a bridge collapse. Also, all the hard work of various labours and the money invested for the construction of the bridge may go to vain.

Wireless Network Sensors are used to develop this IoT based system. Using WSN various types of data can be collected such as water levels, tilt conditions, strain, cracks and, vibrations. All these data are collected and stored respectively and analysed when required. There are databases provided to store these analysed data. All sensors collect the real time value and send it to the server. If the sensor value is above the limit, then the system will close the road using servo motor and display information on LCD and dashboard to notify the people. The condition of the bridge will be displayed for the public to view. Thus, making them aware of the condition of the bridge. There will also be authorities monitoring the bridge conditions when they log in to the system. The sensor technologies will make the monitoring process more accurate and faster. The most important is to reduce the accidents which may occur on the bridge that may put people’s lives in jeopardy.

BLOCK DIAGRAM

LCD

Servo motor

Vibration Sensor (Measuring vibrations)

Monitor System (Dashboard)

ESP8266(Microcontroller)

Accelerometer (Detect tilt in 3 axis -XYZ)

Ultrasonic Sensor (Crack Detection)

Soghe water sensor (wate level indicator)

Load cell (Strain sensor)