

Development of an IoT-based Bridge Safety Monitoring System

ABSTRACT

Different disasters and damaged sites require different professional disaster rescue knowledge and equipment in order to achieve optimal rescue results. However, lack of information about the damage site can impede information management at the rescue center and rescue operation, resulting in poor rescue efficiency or even preventable casualties. In this system, an IoT-based bridge safety monitoring system is developed using the ZigBee technology. This system is composed of: (1) monitoring devices installed in the bridge environment; (2) communication devices connecting the bridge monitoring devices and the cloud-based server; (3) a dynamic database that stores bridge condition data; and (4) a cloud-based server that calculates and analyzes data transmitted from the monitoring devices. This system can monitor and analyze in real time the conditions of a bridge and its environment, including the waters levels nearby, pipelines, air and other safety conditions. The detected data and images are transmitted to the server and database for users to have real-time monitoring of the bridge conditions via mobile telecommunication devices.

EXISTING SYSTEM

Generally many disasters occurred during floods. The bridges will get damaged . If the higher authorities didn't recognize it then people who are going in that way may lose their lives. Many people lost their lives. As authorities are staying far away from the bridges it is difficult for them to notice the problem. Rescue operations are going slowly as they didn't know when the incident occurs. Different disasters and damaged sites require different professional disaster rescue knowledge and equipment in order to achieve optimal rescue results. However, lack of information about the damage site can impede information management at the rescue center and rescue operation, resulting in poor rescue efficiency or even preventable casualties. However there are many drawbacks like power consumption of equipment is high and cost of the equipment is high.

DRAWBACKS

- Failure to collect data or monitor on-site conditions in real time and failure to comprehensively record or analyze the collected data of on-site conditions in real time, resulting in poor disaster rescue efficiency.
- The cost is high.
- Power consumption is more.

PROPOSED SYSTEM

In this system, an IoT-based bridge safety monitoring system is developed using the ZigBee technology. This system is composed of: (1) monitoring devices installed in the bridge environment; (2) communication devices connecting the bridge monitoring devices and the cloud-based server; (3) a dynamic database that stores bridge condition data; and (4) a cloud-based server that calculates and analyzes data transmitted from the monitoring devices. This system can monitor and analyze in real time the conditions of a bridge and its environment, including the waters levels nearby, pipelines, air and other safety conditions. The detected data and images are transmitted to the server and database for users to have real-time monitoring of the bridge conditions via mobile telecommunication devices.

ADVANTAGES

- Rescue operations are done quickly.
- Low power consumption.
- It provides high safety.

SYSTEM EQUIREMENTS

H/W System Configuration:-

- Processor - Pentium –IV
- RAM - 4 GB (min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard

- Mouse - Two or Three Button Mouse
- Monitor - SVGA

S/W System Configuration:-

- Operating System : Windows 7 or 8 32 bit
- Application Server : Tomcat5.0/6.X
- Programming Language : Java
- Java Version : JDK 1.6 and above