

## **IoT-Based Bridge Health Monitoring System Using Cloud**

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### **Abstract:**

Bridges are critical transportation infrastructures that require continuous health monitoring to ensure public safety. Traditional inspection methods are manual, time-consuming, and prone to human error. This project proposes an IoT-based smart bridge monitoring system using vibration and strain sensors to detect abnormal stress, cracks, and vibration patterns.

Sensor data is transmitted to a microcontroller (e.g., NodeMCU/ESP32), which uploads the readings to a cloud platform such as ThingSpeak or Blynk. When irregularities exceed predefined thresholds, the system sends instant alerts to maintenance authorities via mobile notifications or email. This real-time monitoring facilitates predictive maintenance, reduces manual inspections, and prevents potential bridge failures through timely intervention.

### **References:**

1. Priya, Ravichandran Muralidharan, Pranav S, Sakthivel Sundar, "IoT-Based ECG Monitoring System for Remote Healthcare Applications," 2024.
2. Felipe Minoru Costa Monobi, Andressa Corrente Martins, "Development of an IoT-Based Sensing System for Structural Health Monitoring Using Low-Cost Accelerometers," 2024.