

Internet of Things Based on Bridge Slope Detection

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Abstract. The slope of the bridge is affected by stress, strain, deflection, temperature, and time-dependent properties such as creep and shrinkage in the structure, resulting in changes in the slope of the bridge. This research creates a system that continuously sends data to a wireless system and detects conditions concerning changes that happen on a specific bridge when pitch varies from the typical state. The accelerometer will measure its acceleration directly when moving horizontally and is placed on the Earth's surface to detect an acceleration of the Earth's gravity at its vertical point for acceleration caused by horizontal movement. This research detects the slope of the bridge with the internet of things. The results of this study show that the accelerometer sensor system reads changes in slope, which then sends the data to the network and is received on a cellphone or computer. It uses the Message Queuing Telemetry Transport protocol with a simple and lightweight publish model and is designed for devices with limited capabilities and small bandwidth, high latency, or networks with low bandwidth. The results of this study prove that the system has succeeded in detecting changes in angle from 0° to 44.03°. The differences between accelerometer and protractor measurements ranged from 0.03 percent to 4.8 percent. The Parameters measured in this study were that the output of this system was [93-96] bps, QoS was 0%, and the delay was [1.54–1.46] seconds. And the results obtained prove that this system has excellent performance.

Keywords: Wireless Sensor, Bridge, Mqtt, Iot