ABSTRACT

Buildings are crucial infrastructure for society. Damage from human actions or disasters can greatly impact the community. Without maintenance, buildings degrade rapidly. Thus, to monitor building vibrations, the solution involves using an MPU6050 sensor, ESP32 nodeMCU, and web server. Tests were done by placing the prototype on the 1st and 2nd floors, subjecting them to loads to monitor vibration acceleration via an accelerometer and angular rotation with a gyroscope. This data reveals the building's vibration patterns. The recorded acceleration data for the 1st and 2nd floors at rest were 9.14-9.41 m/s² and 9.91-10.07 m/s². Under a 1-person load, the 1st floor's acceleration was 10-10.13 m/s², and the 2nd floor's was 9.88-10.16 m/s². With 2 people, the 1st floor's acceleration ranged from 10.06-10.28 m/s², while the 2nd floor's was 10.29-10.33 m/s². For 3 people, the 1st floor's value was 10.48-10.72 m/s², and the 2nd floor's was 10.29-10.33 m/s². The data shows that the 2nd floor responds more to vibration than the 1st floor, at rest and under load. Vibration acceleration increases with load or source but not linearly. The MPU6050 sensor data is accessible on a web server anytime.

***Keywords**: accelerometer, building structure, MPU6050, nodeMCU ESP32, vibration acceleration, web server.*