

A Building Structure Health Monitoring Device Based on Cost Effective 1-Axis Accelerometers

Authors : Chih Hsing Lin, Wen-Ching Chen, Ssu-Ying Chen, Chih-Chyau Yang, Chien-Ming Wu, Chun-Ming Huang

Abstract : Critical structures such as buildings, bridges and dams require periodic inspections to ensure safe operation. The reliable inspection of structures can be achieved by combining temperature sensor and accelerometers. In this work, we propose a building structure health monitoring device (BSHMD) with using three 1-axis accelerometers, gateway, analog to digital converter (ADC), and data logger to monitoring the building structure. The proposed BSHMD achieves the features of low cost by using three 1-axis accelerometers with the data synchronization problem being solved, and easily installation and removal. Furthermore, we develop a packet acquisition program to receive the sensed data and then classify it based on time and date. Compared with 3-axis accelerometer, our proposed 1-axis accelerometers based device achieves 64.3% cost saving. Compared with previous structural monitoring device, the BSHMD achieves 89% area saving. Therefore, with using the proposed device, the realtime diagnosis system for building damage monitoring can be conducted effectively.

Keywords : building structure health monitoring, cost effective, 1-axis accelerometers, real-time diagnosis

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