Abstract

A bridge is a construction structure that functions to connect two parts of a road that are cut off due to a path break such as a river flow, a problem that often occurs in bridge construction is structural failure in the construction of the bridge, so tools are needed to detect conditions on the bridge. Sensor Sun Small Programmable Object Technology (SunSPOT) is an embedded device that can be programmed with Java, which is used for collecting dynamic structural response vibrations to the bridge to be tested using the accelerometer sensor found in SunSPOT. Ibrahim Time Domain (ITD) is one of the first techniques formulated for multiple output modal analysis based on the impulse response function, this method is used to determine the condition of the bridge based on the time and frequency domains which will later be compared to the data that produces normal vibrations with the resulting data vibration damage. The test results of this study state that the detection of bridge conditions using the Ibrahim Time Domain (ITD) algorithm obtains the average frequency value and the maximum frequency value of each sensor, where the maximum value of the frequency of each sensor is compared with the two bridge conditions, namely normal conditions and damage. . Then data from normal vibration results and data from vibration damage results obtained a bridge condition level of 82% (8 sensors). It can be concluded that the condition of the bridge has decreased by 18%, and for 4 sensors it results in a bridge condition level of 63%. It can be concluded that the condition of the bridge has decreased by 37%.

Keywords: Ibrahim Time Domain, Bridge, Damage Detection, SunSpot