

عنوان مقاله:

INEXPENSIVE DAMAGE DETECTION OF CABLE-STAYED BRIDGES USING SIGNAL PROCESSING AND MACHINE LEARNING

محل انتشار:

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خلاصه مقاله:

Nowadays, with the help of the structural health monitoring methods, it is feasible to detect the occurrence of loss at the very early stages and to preventing from the financial and human losses. However, one of the main obstacles to the prevalence of such methods in the country is the high cost of health monitoring systems. The purpose of this study is to providing and detecting an inexpensive method for loss of bridges using signal processing and machine learning techniques. In order to reduce the costs, the number of sensors for monitoring the structure vibration has decreased. Since the reduction of the sensors number might reduce the accuracy level of the structure damage indexes health monitoring, the most up to date signal processing methods are used. In the first step of the paper, several time-frequency signal processing techniques are compared and EWT is selected as the best method. In the next step, after decomposition of signals by time-frequency techniques, a new damage index is introduced base on cross wavelet transform (CWT) and then calculated damaged indices are classified using support vector machine (SVM) to be able to distinguish healthy and damage states. The results indicate that the above method with high accuracy can detect the damages in the structure.

کلمات کلیدی:

Structural health monitoring, Damage detection, Signal processing, Cross wavelet transformation, Support vector machine

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