عنوان مقاله:

Prediction of the natural frequency of cantilever beams Using artificial neural networks

محل انتشار:

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خلاصه مقاله:

Available methods for calculating frequency in cantilever beams have much complexity, in this study. we try to present a new method for calculating natural frequency in cantilever beams. For this purpose, we use the Finite Element method, dynamic analysis and Artificial Neural Networks (ANNs) techniques to calculate natural frequency in cantilever beams. We use Abaquse Software as finite element software to analysis 100 samples of cantilever beams, the results will be used as a training and testing data sets in Artificial Neural Networks. In ANN we use Multilayer feed-forward network and Back-propagation algorithm, we used of different transfer functions and build 45 different networks to find the best network with better performance. Mean Square Error (MSE) have been used to evaluate the performance of our network. In the end, we do a comparison of natural frequency which predicted with Artificial Neural Network techniques and the natural frequency with calculated with the theoretical formulation and FEM methods, result shown the error is quite low

کلمات کلیدی:

Natural frequency، Artificial Neural Networks، Mean Square Error، cantilever beams، finite element