عنوان مقاله:

Structural Health Monitoring Based on Smart Fuzzy Network Using FEM Database

محل انتشار:

چهاردهمین کنفرانس سیستم های فازی ایران (سال: 1394)

تعداد صفحات اصل مقاله: 7

نویسندگان:

Amir Bahadorifard - *M.Sc., Department of Mechatronic Engineering, Islamic Azad University, South of Tehran Branch*

Ahmad Soleymani - *M.Sc., Department of Aerospace Engineering, Shahid Beheshti University, GC Tehran, Iran*

Taghi Shojaee - *PhD Candidate, Department of Mechanical Engineering, Iran University of Science and Technology*

خلاصه مقاله:

The term Structural Health Monitoring (SHM) which describes the diagnosis of the damage condition in a structure is necessary for having a reliable structure. However, due to a wide variety of unforeseen circumstances, it will never be possible to design and build structure that has no probability of failure and also for the same reason using classic numerical algorithms can t give us a versatile view to predict the damage condition. However fuzzy logic algorithms because of its own uncertainties can be a more suitable tool for effectively handling the complexities of real structures. The general method of this research is about designing an unsupervised learning smart fuzzy network. Database required for training this network is gathered from the Finite Element Model (FEM) of structure so it can compute place and amount of damage. Inputs of this system are converted to triangular fuzzy sets through a continuous fuzzifier and center of gravity defuzzifier is done on the outputs. For assuring that even small changes of damage can be monitored, a minimum correlation Inference is the inference engine of network. At last the designed network is used for a cracked fixed–free beam. Inputs are natural frequencies which are obtained from simulation environment.

کلمات کلیدی:

Structural Health Monitoring (SHM), Smart Fuzzy Network, Minimumcorrelation Inference, Natural Frequency, FEM