

A Naïve-Bayes classifier for damage detection in engineering materials

ABSTRACT

This paper is intended to introduce the Bayesian network in general and the Naïve-Bayes classifier in particular as one of the most successful classification systems to simulate damage detection in engineering materials. A method for feature subset selection has also been introduced too. The method is based on mean and maximum values of the amplitudes of waves after dividing them into folds then grouping them by a clustering algorithm (e.g. k-means algorithm). The Naïve-Bayes classifier and the feature sub-set selection method were analyzed and tested on two sets of data. The data sets were conducted based on artificial damages created in quasi isotopic laminated composites of the AS4/3501-6 graphite/epoxy system and ball bearing of the type 6204 with a steel cage. The Naïve-Bayes classifier and the proposed feature subset selection algorithm have been shown as efficient techniques for damage detection in engineering materials.