عنوان مقاله:

Manifold Learning Algorithms Applied to Structural Damage Classification

محل انتشار:

مجله مکانیک کاربردی و محاسباتی, دوره 7, شماره 0 (سال: 1400)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

A comparative study of four manifold learning algorithms was carried out to perform the dimensionality reduction process within a proposed methodology for damage classification in structural health monitoring (SHM). Isomap, locally linear embedding (LLE), stochastic proximity embedding (SPE), and laplacian eigenmaps were used as manifold learning algorithms. The methodology included several stages that comprised: data normalization, dimensionality reduction, classification through K-Nearest Neighbors (KNN) machine learning model and finally holdout cross-validation with ۲۵% of data for training and the remaining ۷۵% of data for testing. Results evaluated in an experimental setup showed that the best classification accuracy was ۱۰۰% when the methodology uses isomap algorithm with a hyperparameter k of ۱۷۰ and ۸ dimensions as a feature vector at the input to the KNN classification machine.

کلمات کلیدی:

Structural Health Monitoring, Manifold learning, feature extraction, machine learning, dimensionality reduction, Damage classification