

عنوان مقاله:

Prediction of seismic-induced structural damage using KNN

محل انتشار:

هشتمین کنفرانس بین المللی پژوهش در علوم و مهندسی و پنجمین کنگره بین المللی عمران، معماری و شهرسازی آسیا (سال: 1402)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Seismic-induced structural damage prediction plays a crucial role in assessing the vulnerability of buildings and ensuring the safety of occupants during earthquakes. In this paper, we propose a predictive model based on the K-Nearest Neighbors (KNN) algorithm to accurately forecast the level of structural damage caused by seismic events. The study begins by collecting a comprehensive dataset that includes relevant information about seismic events, building characteristics, and the severity of damage. The dataset is preprocessed to handle missing values, outliers, and normalize numerical features. Feature selection techniques are applied to identify the most influential attributes that strongly correlate with structural damage. The dataset is then divided into training and testing sets, with the training set used to train the KNN model. The KNN algorithm calculates the distance between a given data point and its k nearest neighbors in the training set, assigning the majority class label to the input data point. The model is evaluated using various performance metrics, including accuracy, precision, recall, and F1 score, on the testing set. To optimize the KNN model, hyperparameter tuning is performed by experimenting with different values of k. The optimal configuration is determined based on the highest prediction accuracy achieved. The trained and optimized KNN model is then used to predict the level of structural damage for new seismic events.

کلمات کلیدی:

damage prediction, KNN, Model training

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