عنوان مقاله:

Generation of Near-Fault Artificial Records using Artificial Intelligence

محل انتشار:

دهمین کنگره بین المللی مهندسی عمران (سال: 1394)

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خلاصه مقاله:

Due to the scarcity of ground motions, it is vital to generate appropriate artificial records in order to perform nonlinear dynamic analysis, particularly in near-field regions. In this paper a novel methodology is proposed to generate pulse-like ground motions. The generation process includes simulation of nonpulse-type high frequency component of ground motions and directivity pulses separately and then combining them to accomplish final pulse-like ground motion. Neuro-fuzzy networks have been used to produce spectrum compatible nonpulse-type ground motions. A smoothening approach is taken in order to extract directivity pulses from training records. PSO is employed to train Neuro-Fuzzy networks using optimized rules and membership functions. Wavelet transform is used to decompose accelerograms to special range of frequencies. PCA is used as a dimension reduction technique in order to improve training efficiency. At the end, an example is provided to show the efficiency of the proposed method

کلمات کلیدی:

Near-fault, Artificial record, Neuro-Fuzzy, Wavelet transform

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