

Optimization of Structures Subjected to Earthquake

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Abstract : To reduce the overall time of structural optimization for earthquake loads two strategies are adopted. In the first strategy, a neural system consisting self-organizing map and radial basis function neural networks, is utilized to predict the time history responses. In this case, the input space is classified by employing a self-organizing map neural network. Then a distinct RBF neural network is trained in each class. In the second strategy, an improved genetic algorithm is employed to find the optimum design. A 72-bar space truss is designed for optimal weight using exact and approximate analysis for the El Centro (S-E 1940) earthquake loading. The numerical results demonstrate the computational advantages and effectiveness of the proposed method.

Keywords : optimization, genetic algorithm, neural networks, self-organizing map

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