

Prediction of Structural Response of Reinforced Concrete Buildings Using Artificial Intelligence

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Abstract : This paper addressed the use of Artificial Intelligence to obtain the structural reliability of reinforced concrete buildings. For this purpose, artificial neuronal networks (ANN) are developed to predict seismic demand hazard curves. In order to have enough input-output data to train the ANN, a set of reinforced concrete buildings (low, mid, and high rise) are designed, then a probabilistic seismic hazard analysis is made to obtain the seismic demand hazard curves. The results are then used as input-output data to train the ANN in a feedforward backpropagation model. The predicted values of the seismic demand hazard curves found by the ANN are then compared. Finally, it is concluded that the computer time analysis is significantly lower and the predictions obtained from the ANN were accurate in comparison to the values obtained from the conventional methods.

Keywords : structural reliability, seismic design, machine learning, artificial neural network, probabilistic seismic hazard analysis, seismic demand hazard curves

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