

Research on seismic response prediction method of railway bridge based on deep learning

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ABSTRACT

The earthquake near the fault is very dangerous, so it is necessary to quickly predict the possible seismic response of the bridge structure based on the recorded seismic action, so as to judge the post-earthquake damage of the structure in the shortest time. A Gated Recurrent Unit (GRU) method is proposed to predict the seismic response of railway Bridges caused by near-fault earthquakes. Then, the GRU model is compared with classical Recurrent Neural Network (RNN) and Long Short-Term Memory Neural Network (LSTM) through numerical model examples. The feasibility and accuracy of the proposed GRU modeling method are verified by comparing the proposed method with the classical method according to the relevant evaluation indexes. The results show that GRU neural network can quickly and accurately predict the seismic response of railway Bridges under the action of near-fault ground motion, and the proposed method still has good robustness in the face of highly nonlinear information.

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The 2024 Structures Congress (Structures24)
19-22, August, 2024, The K hotel, Seoul, Korea

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