

On The Drop-Out Mechanism In Dealing With Shm Incomplete Data

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Drop-out refers to dropping out units (both hidden and visible) in a neural network. Drop-out randomly ignores some units during training by enforcing the weights as 0 to reduce the connections in the neural network and thus to prevent overfitting. In SHM data analysis, missing data problems can be frequently encountered, which made a well-trained model highly un-robust. Here we introduce the drop-out mechanism in the input layers: by randomly ignoring the units in the input layer to simulate the missing data in the inputs, we enforce the model to learn the invariant patterns in a missing data condition. The proposed method is then conducted and validated on the dataset released in the 1st IPC-SHM (International Project Competition for Structural Health Monitoring), the monitored cable tension data is obtained from a group of 14 cables of a double-tower double-cable-plane cable-stayed bridge in 10 days.