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Automated Data Interpretation for Modal Identification of a Truss Bridge

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Various kinds of uncertainty involved in bridge field test data leads to a number of extraneous modes which are difficult to be separated from real structural modes, thus making automatic data interpretation be a challenge in structural identification (St-Id) area. A practical St-Id procedure consisting of multi-level data pre-processing techniques and a vector backward auto-regressive (VBAR) method is proposed in this article for automatic data interpretation. In contrast to the difficulty to manually separate structure modes from extraneous modes in most traditional modal identification methods, the VBAR method provides a deterministic way to automatically distinguish them. The proposed data pre-processing strategies play a key role to mitigate uncertainty and improve data quality. Without them, the subsequent data post-processing may meet problems. Ambient test data of a cantilever beam is studied to show how the proposed St-Id procedure automatically interprets test data. St-Id of a long-span truss bridge using field test data is performed to illustrate that the proposed method is effective for real bridge identification.

Ключевые слова:

Содержание.

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