

## MST-GAN framework for estimating spatio-temporal frequency variation under vehicle bridge interaction

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### ABSTRACT

Railroad bridges are subject to large and directional forces, which their interactions cannot be ignored. Such interaction induces the temporal variation of fundamental frequencies, resulting structural inspection using conventional approaches challenging. Thus, the presented study develops a deep learning algorithm to evaluate the real-time spatio-temporal frequency variation of a railroad bridge. In this study, Modified Stockwell Transform (MST) is used to describe spatio-temporal frequency variations. Using MST under various scenarios, a conditional Generative Adversarial Network based algorithm is developed to extract interacting frequencies. Laboratory scale tests are performed to experimentally validate the framework.

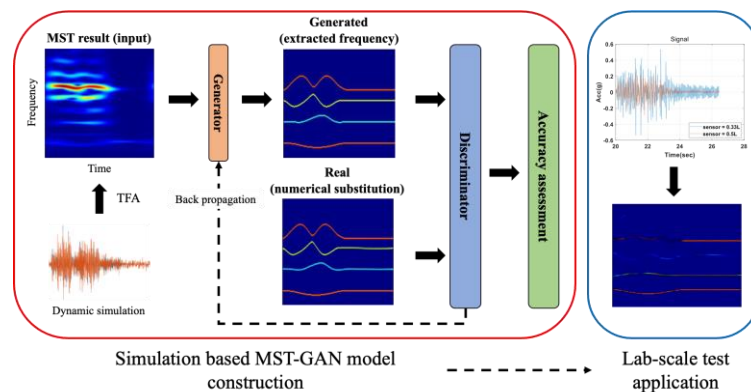


Fig. 1 Framework of the proposed MST-GAN Model.

### REFERENCES

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