

## **A Machine-Learning-Based Flaw Detection Method for Inspection Data of Bogie Parts**

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Nondestructive inspections such as magnetic particle testing and ultrasonic testing are used to inspect railway vehicle bogie parts. However, identifying flaws from images or waveforms requires significant experience. Therefore, we developed a machine-learning-based method to automatically detect flaws. In magnetic particle testing, false indications caused by surface roughness require discrimination. Our model extracts suspected regions and identifies connected ones as flaws, achieving an accuracy of about 70%. In ultrasonic testing, where surface-shape echoes are confused with flaw echoes, a model trained on simulated waveforms detected internal flaws with an accuracy exceeding 95%. These methods enable uniform identification and de-skilling of flaw detection.