

Intelligent Health Monitoring & Damage Detection for Long-span Bridges

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Abstract: Artificial Intelligence has taken revolution for structural health monitoring. In this lecture, the state-of-the-art machine learning (ML)-based health diagnosis techniques for long-span bridges are first introduced, which includes the algorithms of vehicle load spatio-temporal distribution identification, anomalous data diagnosis and recovery, dense displacement identification, multi-type surface damage recognition, concealed local and global damage detection, and vortex vibration identification and prediction. Then the big data health intelligent diagnosis software for long-span bridges is demonstrated, and the engineering application of the ML-based health diagnosis algorithms and software are also summarized. Finally, the future development direction of artificial intelligence in structural health monitoring is discussed.

Keywords: Artificial intelligence, Machine learning, Structural health monitoring, Damage detection, Long-span bridges