

Automatic Identification Of Vortex Induced Vibration Of Long-Span Bridges Using Kernel Mean Matching Method

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The machine learning algorithms are used to sensitively capture the characteristics of vortex induced vibration (VIV) in the massive historical data accumulated by structural health monitoring (SHM) system for several years, and has gradually become a promising method of VIV identification. The algorithms proposed by previous researchers require historical VIV data to set the threshold or parameters to identify VIV in real-time. However, most long-span bridges do not record a large amount of VIV data, because VIV can only occur in a specific wind environment, so it is rare, or the bridge has not been equipped with SHM system before. This study proposes an automatic VIV identification method using kernel mean matching (KMM) method, which can identify VIV in real-time without parameters setting and VIV historical data collecting. The strong generalization ability and high accuracy and efficiency of the proposed method is verified on the SHM dataset of a long-span suspension bridge in China.