

Optical and Vision-based Measurement Methodologies and Systems for Condition Monitoring

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ABSTRACT:

Optical coherence velocimeter (OCV) and artificial fringe pattern vision-based dynamic measurement are two emerging measuring techniques for vibration and acoustic monitoring with high sensitivity and precision. Originating from optical coherence pattern, the artificial fringe pattern based technique could achieve two-dimensional and three-dimensional vibration measurements with simple setup using a camera and a printed or projected pattern. The multi-point OCV system is more complicated than the vision one, however, it demonstrated higher precision down to nano meter, and higher robustness even under strong environmental disturbance. This talk will introduce the theory of optical and vision-based vibration measurement methodologies, as well as the experimental setups for real-time vibration condition monitoring. Finally, by comparing and analyzing the performance of these vibration monitoring methods, the importance and advantages of optical and vision-based technologies are demonstrated.