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Kenote Speech: Vision-Based Non-Stationary Vibration Analysis

Abstract: It is of increasing importance to collect vibration signals for real-time monitoring the condition of machines and effectively diagnosing possible faults to make an efficient machine maintenance strategy. The machine always vibrates along a still location subjected to some kind of force. The quiet, invisible vibrations of machines carry a tremendous amount of information that can't be directly achieved by the people. The accelerometer is a useful sensor to measure the vibration signals, but it should be put attached with the object. The laser displacement meter is a non-contact sensor for vibration measurement but it relies on an active scanning method. This speech introduces a non-contact and passive vibration measurement approach by using a camera. This approach can relate subtle variations in camera video to the vibrations of recorded surfaces. The speech introduces the theoretical principle for visual vibration analysis, and presents a study on how to deal with non-stationary vibration analysis by using this approach. Finally, we provided some experimental results on the vision-based non-stationary vibration analysis.

Biography:

Qingbo He is a Professor with the State Key Laboratory of Mechanical System and Vibration, Shanghai Jiao Tong University. His current research interests include a combination of machinery dynamics, signal processing, and data mining for intelligent monitoring, diagnosis, and control in precision machines, systems, or processes. He has published more than 120 papers, including over 70 papers on well-known international journals. He was selected as a member of the Youth Innovation Promotion Association of the Chinese Academy of Sciences in 2016. He received the *New Century Excellent Talents in University Award* from the Ministry of Education of China in 2013, and the Best Paper Award from the 2016 International Symposium on Flexible Automation.