

Application of Adaptive Algorithm in Rotating Machinery Fault Diagnosis

黃晉緯、吳建達

E-mail: 9314547@mail.dyu.edu.tw

ABSTRACT

In this study, an application of adaptive order tracking fault diagnosis technique based on Recursive Least-Square algorithm, Kalman algorithm and variable step-size affine projection algorithm (VSS APA) is presented. Order tracking fault diagnosis technique is one of the important tools for fault diagnosis of rotating machinery. Conventional methods of order tracking are primarily based on Fourier analysis with reference to shaft speed. In this study, a high-resolution order tracking method with RLS algorithm or recursive Kalman algorithm or VSS APA is used to diagnose the fault in a gear set. The RLS algorithm, recursive Kalman algorithm and VSS APA can overcome the problems encountered in conventional methods. The problem is treated as the tracking of frequency-varying bandpass signals. Ordered amplitudes can be calculated with high resolution after experimental implementation. Experiments are also carried out to evaluate the proposed system in gear set defect diagnosis. The experimental results indicated that the proposed algorithms are effective in gear set fault diagnosis.

Keywords : Fault diagnosis; Order tracking; Recursive Kalman algorithm; RLS algorithm; VSS APA.

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