IDENTIFICATION DAMAGE OF MACHINE SIMULTANEOUSLY IN OUTDOOR WITH INDEPENDENT COMPONENT ANALYSIS

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Abstract

Using statistical properties of the independence by one sound source which does not affect other machines. Mixed signals can be separated with the method of Independent Component Analysis (ICA). In this research aimed to evaluate the performance of mixed signal separation technique motors simultaneously to time-domain (TDICA), Frequency-domain (FDICA) and Multistage-ICA (MSICA) due to the background noise captured microphone arrays arrested. In the industrialized there are three common conditions that can occur on a machine, that is normal (baseline), unbalance and bearing fault. In experiments carried out by adding background noise to the mixture of sound sources in the form of white, pink, bubble and factory noise with signal-to-noise ratio (SNR) of 0 dB to 40 dB with decreasing every 5 dB. From experimenting with different configurations, one motor and one sensor, with up to four motors and four sensors, TDICA produce signal estimate a better than other methods. This research could be separated at mixed-signal by looking spectrogram and MSE. Mixing the signal with noise having SNR 10 is the limit that can detect damage to the machine.

Key words : Microphone Array, Independent Component Analysis, FDICA, TDICA, MSICA, MSE, SNR