Automatic musical instrument recognition using modulation spectral analysis

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Abstract

In this paper, modulation spectral analysis is employed to extract discriminated features for musical instruments recognition. First we apply modulation spectral analysis on subband energy, to extract variant modulation spectral features, including subband average energy, subband energy standard deviation, extended subband energy, extended subband average energy, and extended subband energy standard deviation. Finally, the Eucidean distance is used to evaluate the distance between test note and each train note. In our experiments, eight instrumental classes, including alto saxphone, bass, cello, flute, oboe, trumpet, violin, and viola, were used to evaluate the performance. The proposed modulation spectral analysis of extended subband energy standard deviation feature achieve the highest recognition accuracy of 92.72% and 92.51% for IOWA and RWC databases.

Keyword：modulation spectral analysis, musical instrument recognition