Extraction of Individual Tracks from Polyphonic Music
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ABSTRACT

In this paper, we develop a method for the isolation of individual musical tracks from polyphonic tracks. The heart of the algorithm is the use of Independent Component Analysis to separate the track, after which the components are to be grouped into subspaces depending on the criteria desired and recombined to put them back in a listenable format.

ALGORITHM

1. Convert to frequency domain with a Short Time Fourier Transform.
2. Perform Singular Value Decomposition to factor the reslting Spectogram matrix.

3. Run Independent Component Analysis to extract the individual fundamental audio components
4. Classify the components into different categories based on amplitude envelopes.
5. Convert the classified components back to the time domain with an Inverse Short Time Fourier Transform
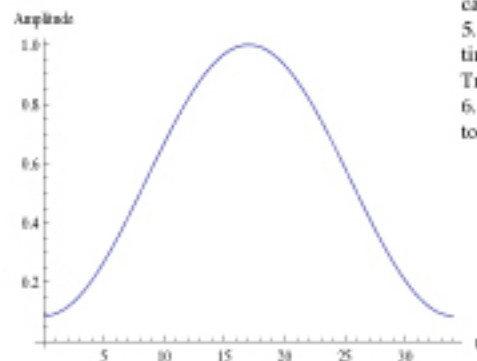6. Linearly recombine the newly classified sources to obtain the separated tracks.

Figure 1: Plot of the hamming window for $N = 35$