

SCORE-BASED ANALYSIS OF EXPRESSIVE PERFORMANCE

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Background

Many attempts have been made to develop an automatic transcription system, that is, a computer program which produces a musical score directly from audio data. In extracting the score, fine details such as expressive timing and dynamics are ignored. We consider the reverse problem, that of extracting the details of a performance from an audio recording, where the score is used to guide the analysis system. To our knowledge, the only researcher who has addressed this problem is Scheirer, who developed a prototype system in Matlab for his masters thesis. Other related works are the automatic accompaniment systems of Dannenberg and Raphael and the recent score following algorithm of Pardo and Birmingham. By aligning the performance with the score at each score event, these systems are implicitly generating a tempo curve, an important part of performance expression.

Aims

The aim of this work is to extend previous work on beat tracking and automatic transcription by taking advantage of the known score information, in order to develop a robust performance analysis system for solo piano music.

Method

An analysis of single piano tones was performed in order to develop bandpass filters with known response characteristics for piano tones, and these filters were used to obtain accurate estimates of performance parameters after the approximate score position was determined by using dynamic programming.

Results

Results are not yet available. The final paper will contain an analysis of the system on a large database of piano performances played on a Bösendorfer computer-monitored grand piano.

Conclusions

The use of score information facilitates analysis techniques which would not be practical to implement in an automatic transcription system, thus providing a finer analysis of the audio data.