

使用漸進式多重序列排比技術來進行多首音樂演奏版本的自動對齊與比較(Multi-Version Music Performance Comparison Based on the Progressive Multiple Sequence Alignment Technique)

劉志俊, 邱繼正

資訊工程學系

資訊學院

ccliu@chu.edu.tw

摘要

The analysis of music expression is one of the most important topics in traditional music research. In recent years, with the advances in content-based analysis of multimedia data, it has become a new research issue to apply information technology to assisting the analysis of music expression. In this paper, we propose an approach for multi-version music performance comparison based on the multiple sequence alignment technique. In this approach, the onset detection technique is first applied to the multi-version recordings of the same composition. The signal between two adjacent onsets is represented with its corresponding chroma vector. Thus a piece of music signal can be transformed into its associated chroma string. For automatical comparing with the multi-version music performances, the progressive multiple sequence alignment technique is applied to their corresponding chroma strings. After these chroma strings are aligned, dynamics and tempo comparisons among the multi-version performances can be carried out in various scale such as a note, a phrase, or the whole song. This paper focuses on the technique of multi-version music alignment, which is the core skill for computer-assisted analysis of music expression. Onset positions are both manually and automatically labeled for estimating the onset detecting errors. Ten versions of CD recordings on Sonatas and Partitas for Violin Solo, composed by Johann Sebastian Bach, are selected as the data set for the experiments. Based on the aligned results, a phynogenetic tree for the ten versions can be automatically generated based on the similarity among their corresponding chroma strings.

關鍵字：music interpretation, music expression analysis, content-based music analysis, chroma strings, multiple music alignment