

Towards Automatic Music Performance Comparison with the Multiple Sequence Alignment Technique

劉志俊

Bioinformatics

Computer Science and Informatics

ccliu@chu.edu.tw

Abstract

In this paper, we propose an approach towards automatic 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 music work. The signal between two adjacent onsets is represented with its corresponding chroma feature vector and symbolized as a chroma symbol. Thus a piece of music signal can be transformed into its associated chroma string. The progressive multiple sequence alignment technique is applied to these chroma strings to find a global alignment for multiple performances. 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. Nine 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. A phylogenetic tree for the nine performances can be automatically generated based on the distance matrix of their aligned chroma strings.

Keyword : Progressive multiple sequence alignment, chroma strings, music performance comparison, music interpretation, content-based music analysis.