Recherche de motifs pour l'étude critique de partitions musicales

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Abstract. Music score analysis is an ongoing issue for musicologists. Discovering frequent musical motifs with variants is needed in order to make critical study of music scores and investigate compositions styles. We introduce a mining algorithm, called CSMA for **C**onstrained **S**tring **M**ining **A**lgorithm), to meet this need considering symbol-based representation of music scores. This algorithm, through motif length and maximal gap constraints, is able to find identical motifs present in a single string or a set of strings. It is embedded into a complete data mining process aiming at finding variants of musical motif. Experiments, carried out on several datasets, showed that CSMA is efficient as string mining algorithm applied on one string or a set of strings.

1 Introduction

Musical motifs are pieces of music that can define a signature for a composer, a music score or a music style. They correspond to identical repeating music chunks or variations applied on a part of music. As music notes are characterized by three kinds of information (melodic, rhythmic and harmonic), musical motifs can also be melodic and/or rhythmic and/or harmonic and our goal is to extract such motifs, with variants, from music scores transcriptions. In data mining, this task corresponds to motif mining from a single sequence or a set of sequences called strings. In our framework, we are more interested in motif mining on strings than by pattern mining in sequences since we consider that a music score can be represented by one or several sequences, one sequence per instrument, and at each timestamp there is only one note in the sequence; the harmonic information is not considered. Moreover, a musical motif corresponds to a music chunk appearing at minimal number of positions through the music score. This motif can be melodic, rhythmic or both, depending on the nature of the music event features.