

Abstract for “Automatic Synchronization of Musical Data: A Mathematical Approach” (2004)

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Digital music libraries typically contain the same piece of music in different data formats (a printed score, MIDI files, and performances on CD recordings). The heterogeneity and complexity of such music data make content-based browsing and retrieval in digital music libraries a difficult task with many as yet unsolved problems. One important step towards a solution could be the use of synchronization algorithms which could automatically link data streams from different formats representing a similar kind of information.

We introduce algorithms which can automatically link any two data streams given in score, MIDI, or CD format (*.wav) representing the same polyphonic piano piece. This series of algorithms involves steps for extracting note parameters such as onset times and pitches from CD data. These discrete parameters make the physical audio data comparable with symbolic score data. We also give a summary and specification of further problems related to the synchronization problems discussed.

*Music Query: Methods, Models, and User Studies (Computing in Musicology 13), 9-34.
Published by CCARH and The MIT Press, 2004.*