

1116-62-2510

**Katherine M. Kinnaird\*** ([kkinnair@macalester.edu](mailto:kkinnair@macalester.edu)), Macalester College, Department of Mathematics, Statistics, and, Computer Science, Saint Paul, MN 55105. *Structure-Based Comparisons for Sequential Data*. Preliminary report.

We present *aligned hierarchies*, a low-dimensional representation for sequential data streams. The aligned hierarchies encode all hierarchical decompositions of repeated elements from a high-dimensional and noisy sequential data stream in one object. These aligned hierarchies can be embedded into a classification space with a natural notion of distance. We motivate our discussion through the lens of Music Information Retrieval (MIR), constructing aligned hierarchies by finding, encoding, and synthesizing all repeated structure present in a song. For a data set of digitized scores, we conducted experiments addressing the *fingerprint task*, a song comparison task in MIR, that achieved perfect precision-recall values and provide a proof of concept for the aligned hierarchies.

We also introduce *aligned sub-hierarchies* and *aligned sub-decompositions*. Both derived from the aligned hierarchies, these structure based representations for songs can be embedded into classification spaces and can address additional MIR tasks. We compare properties of the aligned hierarchies, aligned sub-hierarchies, and the aligned sub-decompositions. (Received September 23, 2015)