

Modeling Rhythm Similarity: Experiments with Afro-Cuban Timelines

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Abstract

A fundamental problem in computational musicology concerns the design of a mathematical measure of rhythm similarity. The applications of such a measure include music information retrieval as well as the phylogenetic analysis of rhythms. Two research projects currently under way at Harvard University that concern rhythm similarity are described. The first project involves human perception of rhythm similarity. Previously a group of six distinguished Afro-Cuban timelines had been compared with respect to a variety of mathematical measures of rhythm similarity in the context of phylogenetic analysis of rhythms [1]-[2]. For some applications it is desired to obtain a measure that correlates well with human perception of rhythm similarity. With this goal in mind, experiments were performed in which a group of listeners compared the same six timelines used in [2], and judged their similarity. The results obtained from these experiments are compared with those obtained with the mathematical measures. The second project concerns Mario Rey's musicological classification of two groups of Afro-Cuban rhythms as being derived from either the *Habanera* or the *Contradanza* [3]. Our goal is to measure the agreement of Rey's classification with respect to human perception and a variety of mathematical measures of rhythm similarity in order to test whether musicological rules that determine group similarity have perceptual and mathematical validity.

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- [3] M. Rey, "The rhythmic component of *Afro-Cubanismo* in the art music of Cuba," *Black Music Research Journal*, Vol. 26, No. 2, Fall 2006, pp. 181-212.