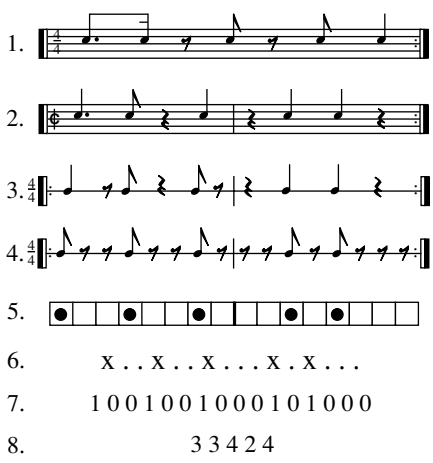

Fig. 1. Eight common ways of representing the clave *Son* rhythm.

planet, known mainly as the *Clave Son* from Cuba (TOUSSAINT, 2002).

The *Clave Son* rhythm is usually notated for musicians using standard music notation which affords many ways of expressing a rhythm. Four such examples are given in the top four lines of Fig. 1. The fourth line displays the rhythm with music notation using the smallest convenient durations of notes and rests. Western music notation is not ideally suited to represent African music (EKWUEME, 1974; AROM, 1991). The fifth and sixth lines show two popular ways of representing rhythms that avoid Western notation. The representation on line five is called the *Box Notation Method* made popular by Philip Harland at the University of California in Los Angeles in 1962, and is also known as TUBS (Time Unit Box System). The TUBS representation is prefereed among ethnomusicologists, and is invaluable to percussionists not familiar with Western notation (EKWUEME, 1974). It is also convenient for experiments in the psychology of rhythm perception, where a common variant of this method is simply to use one symbol for the beat and another for the pause, as illustrated in line six. In physiology, where the study of cardiac rhythms is important, as well as in computer science the clave *Son* would be written as the 16-bit binary sequence shown on line seven. Finally, line eight depicts the interval length representation of the clave *Son*, where the numbers denote the lengths (in shortest convenient units) of the intervals between consecutive beats (onsets). The compactness and ease of use in text, of this numerical interval-length representation, are two of its obvious advantages, but its iconic value is minimal.

This paper first reviews methods for visualizing and representing rhythms, and then compares various measures of rhythm dissimilarity, including the Hamming distance, the Euclidean interval-vector distance, the interval-difference distance measure of Coyle and Shmulevich, the swap distance, and the chronotonic distance measures of Gustafson and Hofmann-Engl. The question of which measure to use in a particular application has received a lot of attention in all areas that are concerned with the comparison of sequences.