Eric Cheng
2.22.06
ISE 599

Exploring Expressive Performance Trajectories:
Six Famous Pianists Play Six Chopin Pieces
Werner Goebl, Elias Pampalk, and Gerhard Widmer

In this paper, the authors present an exploratory approach to analyzing large amounts of expressive performance data. Using recordings of six famous pieces by six famous pianists, tempo and loudness information was derived semi-automatically, divided into musically relevant phrases, normalized, and smoothed in various grades. The data set was clustered to determine broad similarities and differences in performers' expressive strategies.

While there has been a considerable amount of music research in the last decades, the authors note that much of it has been restricted to one expressive parameter or to a few individual performances. The aim of this paper is to present an exploratory approach that allows for the analysis of larger amounts of data. They analyzed commercially available audio recordings of 3 Nocturnes and 3 Préludes by Chopin played by 6 renowned pianists: Claudio Arrau, Vladimir Ashkenazy, Adam Harasiewicz, Maria João Pires, Maurizio Pollini, and Arthur Rubenstein. A beat track was determined for all the recordings using an automatic beat-tracking computational tool. The pieces were then dissected into small segments according to their musical phrase structure. The two dimensional data for each phrase were displayed visually with tempo information on the *x* axis and loudness information on the *y* axis.

The clustering technique allowed the researcher to predefine input parameters of interest. In this study, the authors chose the following input parameters: the type of normalization applied to the data, the degree of smoothing, and the weighting between tempo and loudness. A graphical user interface allowed the authors to adjust these parameters and interactively explore their impact on the clustering process. The clustering process was carried out through the aligned self-organizing maps algorithm (SOM) which groups data into a predefined number of clusters that are displayed on a two-dimensional map. All the elements of a data cluster are similar to each other, and the distance between two clusters is inversely proportional to their similarity. The results were displayed in an interactive HTML page in which the user is given the option of controlling the various input parameters and seeing the resulting clusters.

The authors note that this method brought to light interesting comparisons among the different performers. There were several notably differing expressive strategies. Pires' resulting clustering seemed to be the exact opposite of Pollini's. Elsewhere, there were commonalities to be found among all the pianists. Most notably, there were a considerable number of common phrase shapes utilized by all performers.

There are several shortcomings to this approach. First, only overall loudness was measured, disregarding the loudness of individual voices, which is of obvious expressive importance in piano performance. Second, information was determined at a predefined track level,which can sometimes disregard potentially important musical events which occur at different scales. Also, there was a certain amount of interpolation used in the data processing in order to compare phrases of differing length.

Overall, the authors present an interesting approach to studying and comparing the performance strategies of many different pianists using a wealth of performance data. The problem with such a technique is that it seems somewhat unwieldy, leaving the researcher a wealth of information that he or she must delve into and interpret to make any musical sense of the results. The process does, however, provide a more precise way in which to compare and contrast different performances in a somewhat objective manner.