MUSICAL STYLE AND AUTHORSHIP CATEGORIZATION BY INFORMATIVE COMPRESSORS

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Background

Musical style and authorship detection is a cognitive human ability, depending on the degree of musical acculturation, experience and emotional sensibility of the listener. Although formal parameters characterizing a musical piece are not well defined.

Aims

This work is aimed to verify how informative entropy of a musical sequence may represent a formal descriptive parameter for musical categorization by evaluating the entropy distribution over the usual stylistic classes as artistic currents, historical periods and musicians' style.

Method

Recently, a novel parameter based on the compressibility of an informative sequence was introduced. The best compression rate of a data sequence is related to the self-similarity of the sequence and then to its complexity. Typical compression algorithms were applied both to audio and MIDI files of musical pieces written by several authors belonging to different stylistic currents. Finally, a distribution analysis of the compression ratios was performed in order to reveal a stylistic clusterization of the musical pieces.

Results

We observed a clusterization of compression ratios around some representative values, by assuming that musical pieces belonging to a specific author or artistic current reveal a similar amount of complexity. Clusters revealed a structured distribution depending on the similarity of artistic currents, providing a natural artistic distance among musical styles. Moreover, musical pieces not included in the previous cluster formation were correctly categorized and attributed to the related author in most of cases.

Conclusion

Formal description provided by entropy analysis may represent a powerful tool for the determination of a uniform class of musical stimuli useful in psychological cognitive tasks. Moreover, it may be related to the ability of a human listener to extract musical descriptive components.

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