A Markov Model for Analysis of Musical Genre

John O. Brickley and Wolfgang Q. Olsson

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1 Abstract

We hypothesize that treatment of individual measures of music[1], as the basic units of analysis across a large corpora of compositions, will allow generation of uniquely identifying probabilistic grammars. These grammars are composed of Markov-chains, which are generated by incrementing through each measure of a selected piece while tallying both that measure's features, and those of the measures which immediately precede and succeed it. Initially, the radius, or neighborhood, is set at $r = 1$ so that one prior and following measure is evaluated for each increment. The neighborhood is then increased, until the hypothesis can be confirmed or rejected. Confirmation or rejection of the hypothesis occurs when a given radius either proves sufficient for intuitively satisfactory classification of analyzed pieces, or the radius is increased to such an extent that distinctions between pieces cease to be fine-grained enough to allow for comparison of pieces in our chosen corpora. Successful research in this area would entail quantitative characterization and comparison of musics both within, and across cultures.

2 Introduction and Background

- Introduce relevant topics.
- Justify question.

[1] i.e. four beats in 4/4 time

- Literature Review
- other approaches, methods
- your approach and justification
- details of the methods you are using
- any additional information needed before the rest of the article
- basic definitions
- topical introductions

2.1 To Include

- possible approaches,
- approaches employed by others in answering similar questions,
- in particular, in which respects other research has already succeeded or failed in settling out hypothesis,
- [1] Chapter 15, Probabilistic Reasoning Over Time chapter in Artificial Intelligence.
- [2] A Classification Approach to Melody Transcription. History.
- for later [3] Fusion of Acoustic and Linguistic Speech Features for Emotion Detection

3 Methodology

References

[1] Stuart Russell and Peter Norvig. *Artificial Intelligence: A Modern Approach*. Prentice Hall, 3rd edition, 2009.

[2] Graham E Poliner and Daniel PW Ellis. A classification approach to melody transcription. In *ISMIR 2005: 6th International Conference on Music Information Retrieval: Proceedings: Variation 2: Queen Mary, University of London & Goldsmiths College, University of London, 11-15 September, 2005*, pages 161–166. Queen Mary, University of London, 2005.

[3] F. Metze, T. Polzehl, and M. Wagner. Fusion of acoustic and linguistic features for emotion detection. In *Semantic Computing, 2009. ICSC '09. IEEE International Conference on*, pages 153–160, Sept. doi: 10.1109/ICSC.2009.32.