MIREX 2012: CHORD RECOGNITION USING DURATION-EXPLICIT HIDDEN MARKOV MODELS

Weibin Shen **Ruofeng Chen** **Ajay Srinivasamurthy** **Parag Chordia**
Georgia Tech Center for Music Technology Smule Inc.
{ruofengchen, weibin_shen, ajays}@gatech.edu parag@smule.com

ABSTRACT

We present an audio chord recognition system based on a generalization of the Hidden Markov Model (HMM) in which the duration of chords is explicitly considered - a type of HMM referred to as a hidden semi-Markov model, or duration-explicit HMM (DHMM). We find that such a system recognizes chords at a level consistent with the state-of-the-art systems – 84.23% on Uspop dataset at the major/minor level. The duration distribution is estimated from chord duration histograms on the training data. It is found that the state-of-the-art recognition result can be improved upon by using several duration distributions, which are found automatically by clustering song-level duration histograms. The paper further describes experiments which shed light on the extent to which context information, in the sense of transition matrices, is useful for the audio chord recognition task. We present evidence that the context provides surprisingly little improvement in performance, compared to isolated frame-wise recognition with simple smoothing. We discuss possible reasons for this, such as the inherent entropy of chord sequences in our training database.

1. PROPOSED METHOD

For more, see [1].

2. REFERENCES

[1] R. Chen, W. Shen, A. Srinivasamurthy, P. Chordia: "Chord Recognition Using Duration-Explicit Hidden Markov Models," In *Proceedings of the 13th International Conference on Music Information Retrieval*, Porto, Portugal, 2012.