Title: Dynamic Bayesian networks for chord and key extraction from symbolic music data

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Abstract:

We propose a probabilistic model of musical passages that can be used in a variety of music information retrieval tasks. Prior distribution of these sequences is defined by means of a dynamic Bayesian network, nodes of which represent different musical concepts, such as key, chord, and non-chord tones. Using dynamic Bayesian networks means that we can select from numerous ready-to-use tools for inference and training, and therefore only have to worry about properly defining the network's structure and the conditional probability distributions. In this way we can quite precisely model such musical phenomena as modulation and mode mixture, chord progression, or non-chord tones.

This prior music sequence distribution can be used to draw samples of musically plausible sequences (as in the task of automatic music composition), estimate the probability of an existing note sequence (genre, composer or period identification task), extract high level information from symbolic music data (harmony analysis), or find the most probable note sequence given a series of observed spectra (multipitch analysis).

In this presentation we would like to demonstrate our framework and preliminary results of harmony analysis of symbolic music data, i.e. extracting information about keys, chords and non-chord tones.