MIREX - Chord Estimation

An introduction and examination

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Audio Chord Estimation:

The essential task addressed during audio chord estimation is transcription of chordal and other polyphonic information from audio data. This data typically encompasses chord quality, shape/voicing, root, and sequence.

The process of audio chord estimation has been being investigated and perfected for thoroughly for years and has a number of important applications (semantic analysis, identification, classification, etc.)

The Datasets (part 1)

Isophonics -

Isophinics applies “pattern mining techniques to over 200,00 chord progression sequences… extracted from the I Like Music (ILM) commercial music audio collection”.

Isophonics makes use of the Chordino vamp plugin for extraction of spectral and chroma information to estimate chords and the CM-SPADE algorithm for pattern recognition and analysis.

Isophonics is associated with The Center for Digital Music at Queen Mary, University of London

The Datasets (part 2)

The McGill Billboard Project -

Similar to the Isophonic dataset, the McGill Billboard Project dataset consists of the chord estimations and data from a random sample of Billboard hot 100 songs from 1958 to 1991.

McGill Billboard also makes use of the Chrodino Vamp plugin.

Chordino

Uses non-negative least squares (NNLS) chroma analysis on treble and bass audio content simultaneously to categorize data into semitones that can then be used to identify chords.

Results - 2015

Isophonics 2009 - 65.95% accuracy across 8 algorithms and 5 voice intervals.

Billboard 2013 - 55.37% accuracy across 8 algorithms and 5 voice intervals.

Billboard 2012 - 60.14% accuracy across 8 algorithms and 5 voice intervals.

Results - 2016

Isophonics 2009 - 73.1% accuracy across 8 algorithms and 5 voice intervals.

Billboard 2013 - 62.73% accuracy across 8 algorithms and 5 voice intervals.

Billboard 2012 - 67.66% accuracy across 8 algorithms and 5 voice intervals.

Results - 2018

Isophonics 2009 - 77.12% accuracy across 5 algorithms and 5 voice intervals.

Billboard 2013 - 68.04% accuracy across 5 algorithms and 5 voice intervals.

Billboard 2012 - 74.03% accuracy across 5 algorithms and 5 voice intervals.

Conclusion:

Audio Chord Estimation is getting better over time.