

Automatic Chord Recognition from Audio

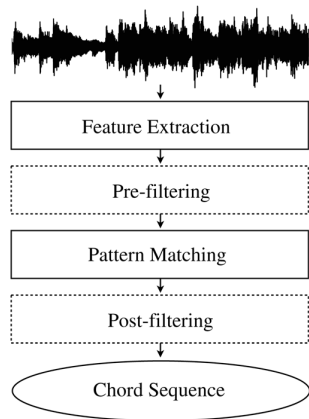
Alex Ray Emmons

Division of Science and Mathematics
University of Minnesota, Morris
Morris, Minnesota, USA

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The big picture

- Automatic chord recognition: extracting chord information from audio
- Feature extraction: extracting harmonic features - note values and timing
- Pattern matching: Assigning chord labels based on pre-defined or stochastic chord models
- Issues: Noise in recordings, determining where chords change, complex music



Outline

- 1 Feature Extraction
- 2 Pattern Matching
- 3 Research Cases
- 4 Conclusions

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- 1 Feature Extraction
 - Pitch Class Profile
 - Preprocessing

- 2 Pattern Matching

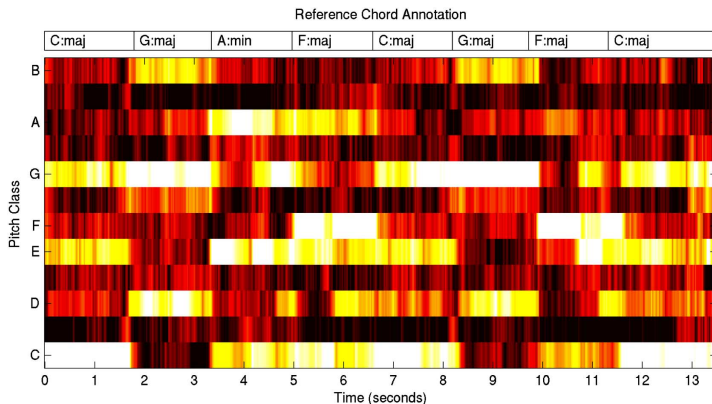
- 3 Research Cases

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Pitch Class Profile

Pitch Class Profile (PCP) measures energy in the 12 frequency regions where musical notes occur (cite).

Each row represents a pitch class, or note, and each column represents a frame, or period of time.



Preprocessing

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 - Hidden Markov Models
 - Gaussian Mixture Models
- 3 Research Cases
- 4 Conclusions

Hidden Markov Models

Gaussian Mixture Models

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1 Feature Extraction

2 Pattern Matching

3 Research Cases

- Effects of Proper Signal Processing
- HMM Trained with Audio-From-Symbolic Data
- Importance of Individual Components

4 Conclusions

Effects of Proper Signal Processing

HMM Trained with Audio-From-Symbolic Data

Importance of Individual Components

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Conclusions

Thanks!

Thank you for your time and attention!

Contact:

- `emmon046@morris.umn.edu`

Questions?

References