Computational Music Analysis

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Contents

Chapter 1

General remarks

General remark: Create excercises with listening, composing and analyzing tasks.

- Sounds in the external world - Perception, constraints (e.g. audible range) - discretization - Musical Universals (3-7 note scales) - allows symbolic representation - scales (independent from tuning/temperament): collections of pitches - members of scale: notes - neighborness - Schenkerian terms: neighbor notes - pitch classes - pitch class sets - intervals - counterpoint - consonance / dissonance - interval classes - interval class vectors - special pitch class sets: chords - Triads - Euler space - tonnetz - seventh chords

- notes in time: durations, rhythm - Schenkerian terms: passing notes - cognitive framework: meter - metrical hierarchies

- visualisations (pitch-time plots) - pianoroll - MIDI - modern Western notation - different keys (not only treble and bass)

Chapter 2

What is Computational Music Analysis?

(Horton, 2001)

Chapter 3

Representations, Formats, and Programs

3.1 Notes

pitches, pitch classes, pitch class sets, GISs,

3.2 Chords

RomanText, Music21, ABC, kern

3.3 Scores

MIDI, MusicXML, MEI

Chapter 4

Music Models

4.1 Regular Expressions

(Chord symbols)

4.2 n-gram Models

(Melody)

4.3 Hidden Markov Models

(Functional Harmony)

4.4 Probabilistic Context-Free Grammars

(Harmony, Form)

Chapter 5

Style

- Zipf's law (style, idiom, intra-opus patterns) (Meyer, 1989) - feature clustering (k-means, PCA, ...)

Chapter 6

History

- trends (maybe with a non note-based dataset e.g. metadata)

Chapter 7

Performance

- Spotify API to compare different recordings

Bibliography

Meyer, L. B. (1989). *Style and Music. Theory, History, and Ideology*. University of Chicago Press.

Horton, T. (2001). The Compositionality of Tonal Structures: A Generative Approach to the Notion of Musical Meaning. *Musicae Scientiae*, *5*(2), 131–159. doi:10.1177/102986490100500202