

# Computational Musicology, Algorithms, and Dataset.

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# Computational Musicology

- Computer-supported study of music
- Focus on analysis, often in a context of music theory, ethnomusicology, and music psychology
- Digital/Computational Musicology -> symbolic representation of music
- Music Information Retrieval -> audio

# Papers

- 30 papers published since 2018
- Music form, pitch dimension, historical evolution, patterns, similarity, syncopation, and so on
- In this talk: Music form, historical evolutions, and databases

# Used Algorithms (1/2)

1. Precision, Recall, F1-score
2. Frequency analysis
3. Hypothesis tests
4. Effect-size
5. Cluster analysis (dendrograms, k-means)
6. Principal component analysis
7. Entropy
8. Support Vector Machine
9. Hidden Markov Models

# Used Algorithms (2/2)

10. Neural Networks (Convolutional and Long-short term memory)
11. TF-IDF distribution (term frequency-inverse document frequency)
12. Latent Semantic Analysis
13. String alignment
14. Strings similarity
15. Longest common substring and subsequence (LCS)
16. Edit distance (between strings and between trees)
17. Latent Dirichlet Allocation
18. Kullback-Leibler

# Form (1/2)

1. Feisthauer et al 2019 Modeling... (Medial ceasura, analysis algorithm, LSTM)
2. Warrenburg at al 2019 Tests... (first/second theme, pairwise variability index, rhythmic variability)
3. Bigo et al 2018 Relevance... (Cadences, SVM)
4. Sears et al 2018 Simulating... (Cadences, predictictability, non-supervised statistical learning)
5. Gotham et al 2019 Taking... (Form representation, syntax, similarity measure, Tree - Edit distance)

# Form (2/2)

Author.year-title	Subject	Algorithm	Dataset
Allegraud.ea2019-learning	Sonata form detection	HMM	Mozart's String quartets
Kutschke.ea2020-historiography	Rounded-binary form	LCS	Songs published in London (1650-1770) and Vienna

# Historical evolutions

1. Chon et al 2018 Exploratory... (instruments combinations, 1701-2000)
2. Moss 2019 Transitions... (changings in tonality in 600 years, TDM, Tonnetz)



# Datasets (1/2)

1. KernScores
2. Music21
3. ABC Beethoven
4. Troubador Melodies Database
5. Cantus Database
6. GregoBaseCorpus
7. Weimar Jazz Database
8. RAG-C Database (Ragtime)

# Datasets (2/2)

9. McGill Billboard
10. Spotify (Metadata)
11. LastFM (Metadata)
12. e-chords
13. Ultimate guitar
14. [Chordify.net](https://chordify.net)
15. Lakh MIDI Dataset (LMD)
16. Chordify Annotator Subjectivity Dataset

# Organization

- Form
- Harmony
- History
- Rhythm / duration
- Similarity / relations

# Some additional comments

- Koops et al 2019 Annotator... (Annotator subjectivity, chord analysis, dataset)
- Frieler 2020 Miles... (comparison between Miles Davis and John Coltrane)
- Neubarth and Conklin 2020 Mining... (interestingness measures, patterns)

# Final considerations

- Contribution to Music Theory
- Anja Volk et al 2011: "new questions formulated in the context of musicological research"
- Invitation to checkout these papers and datasets.

# Contact

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