Paper Reading & Practice

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Two Parts

- Paper Reading:
 - Perceptual basis of evolving Western musical styles
 - Supporting Information

- Practice
 - Music21
 - attempt at feature extraction

Music underwent substantial changes



Fig. 1. Visualization of the clusters for the conditional distribution of melodic intervals. Each shaded area corresponds to a different cluster, and its corresponding line represents the proportion of years assigned to it within a 10-y smoothing window. Vertical dashed lines correspond to the approximate boundaries between Baroque, Classical, and Romantic periods. A fifth cluster was removed because it was a noise cluster with only three elements.



Explain the characteristic of periods

- Orthogonal NMF
 - *P2 middle left
- Musicological Interpretation





- Matrix T
 - rows correspond to a flattened coding of each year's data
- e "each year's data"
 - Conditional probability matrix
 - Joint probability matrix
 - Reshape and concatenate into vectors

Orthogonal NMF



(number of years) = Y
(dimension of features) = F
* What is K?

H corresponds to a set of relevant characteristics of the styles found using k-means, and W is their weight over time.

Relevant characteristics of the styles



Diatonic: 自然音阶的

IR Theory





Music21

- a Python-based toolkit for computer-aided musicology
- a project nurtured at MIT
- http://web.mit.edu/music21/

MusicXML Parsing

• Call MuseScore/Sebilius/Fenale to display score

Parse MusicXML (or other format) into note stream

MusicXML Parsing



G#5	80.0
E4	64.0
E3	52.0
E5	76.0
A4	69.0
A2	45.0
A3	57.0
C#5	73.0
A3	57.0
C#6	85.0
A3	57.0
A5	81.0
A2	45.0
A3	57.0
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AD	57.0
A3	57.0 57.0

Feature extraction

