

Aspects of Rhythm and Meter

Music 254

Regularity vs Irregularity

▶ **Meter**

- ▶ Ordinary meters as notated
- ▶ Ordinary meters as sounded/heard
- ▶ Unmeasured music
- ▶ Polymeter; hypermeter

▶ **Accent**

- ▶ Prosody approach
- ▶ Tonal and inflectional

▶ **Hierarchical aspects of rhythm**

- ▶ Melodic contributions
- ▶ Harmonic contributions



Meter

Meter and metrical ambiguity

Compound meter



Dual-role notes (chained melodies)

Two musical staves illustrating dual-role notes (chained melodies). The top staff shows a melody in 6/8 time, with a 'motive' bracketed over measures 5 and 6, and a 'sequence' bracketed over measures 7 and 8. The bottom staff shows a melody in 6/8 time, with a 'Subj. 2' label and a '7' measure number.

Accent

Prosody models

Simple Duple:



Simple Triple:



Simple Quadruple:

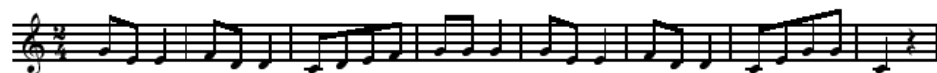


▴ = primary accent ◡ = secondary accent

TONES & WORD ACCENTS

LEVEL		CONTOUR	
ě	or ▴ Extra high	ě	or ▴ Rising
é	▴ High	ê	▴ Falling
ē	▴ Mid	ẽ	▴ High rising
è	▴ Low	ẽ	▴ Low rising
ẽ	▴ Extra low	ẽ	▴ Rising-falling etc.
↓	Downstep	↗	Global rise
↑	Upstep	↘	Global fall

Combination measures



Harmonic Structure	T	T	D	D	T	T	D	D	T	T	D	D	T	D	T
Motif Structure	a		a'		b		c		a		a'		b'		c'
Phrase Structure	A				B				A				B'		

Metrical evaluation

Metrical skimming



Variable meter

"Maria" from West Side Story



Performance of time

Tempo-loudness visualizations (Widmer et al.)

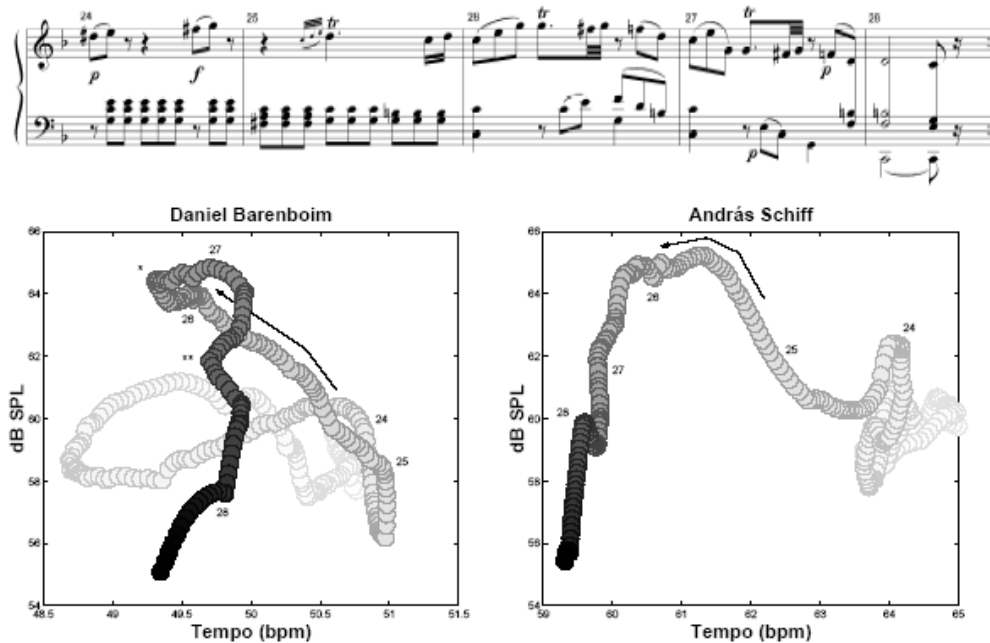
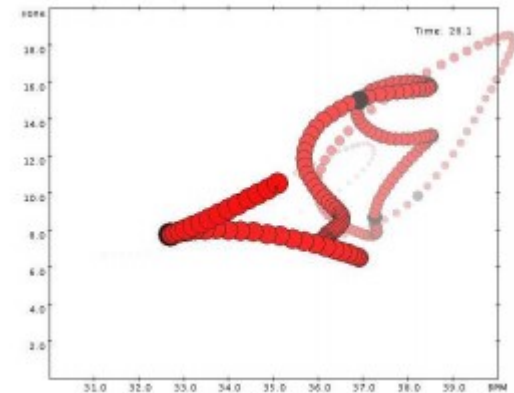
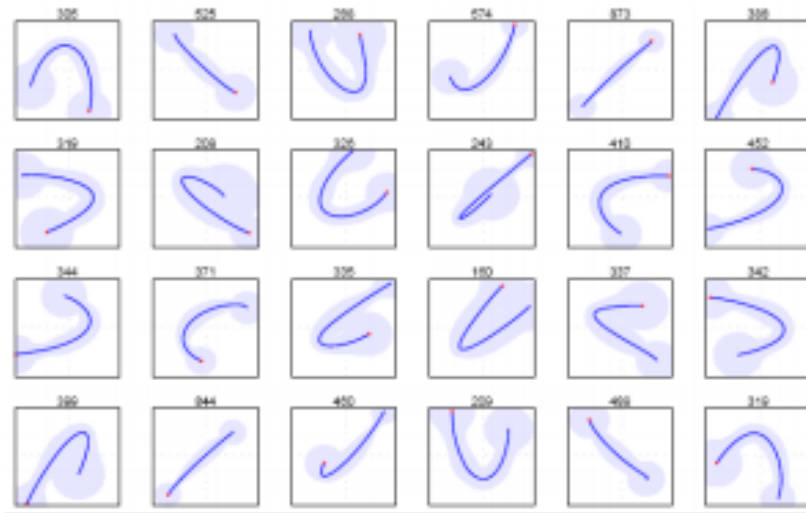


Figure 4. Expression trajectories over the last bars (mm. 24–28) of the Mozart piano sonata K. 279, second movement, first section, as played by Daniel Barenboim (left) and András Schiff (right). *x* axis: tempo in beats per minute; *y* axis: dynamics ('loudness') in decibel. The darkest point represents the current instant (third beat of m. 28), while instants further in the past appear fainter.

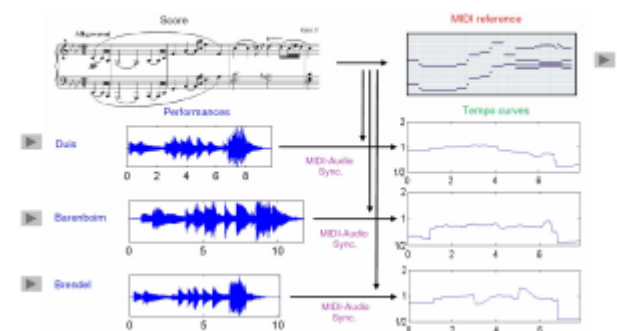
Widmer (2006-09): Performance worms

Performance alphabet



Beat-level changes:
Famous performers

Computation of Tempo Curve

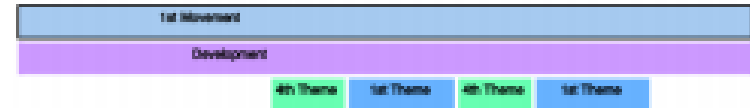


Widmer et al. (ISMIR 2015)

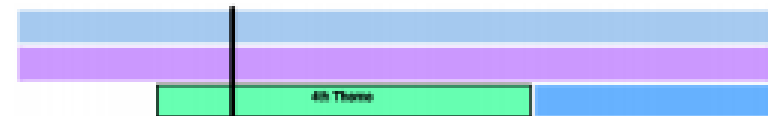
- **Focus:** Classical music on the web
- **Objective:** compare visual user interfaces
- **Observations:**
 - popular music – linear listening
 - classical music – content-oriented



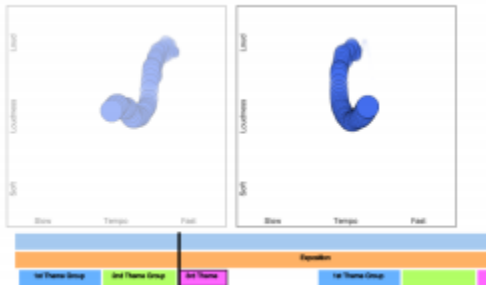
(a) Overview



(b) Zoom



(c) Playback



Structural navigation

Multi-modal navigation: Beethoven's “Eroica” Symphony (No. 3)

















Accent

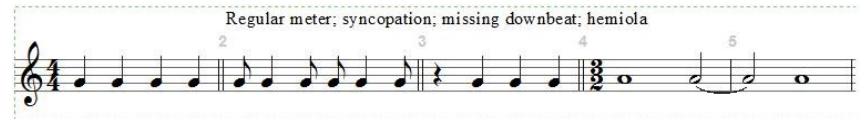
Metrical challenges

Mensural notation

16th Century Note Durations

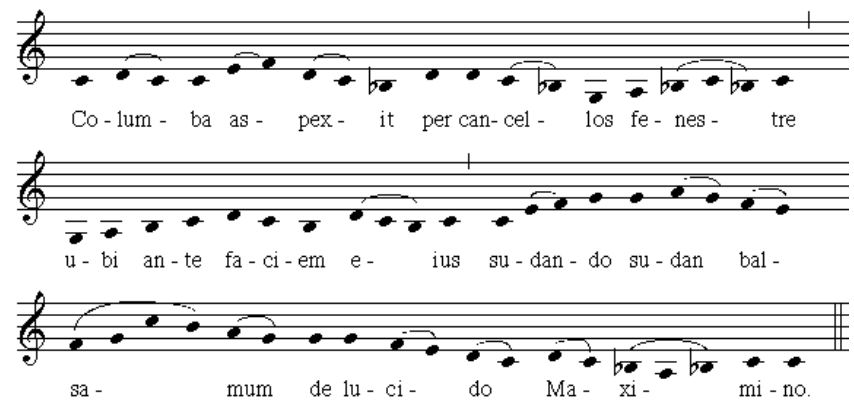
	Maxima	
	Longa	
	Breve	= Double whole note 
	Semibreve	= Whole note 
	Minim	= Half note 
	Semiminim	= Quarter note 
	Fusa	= Eighth note 
	Semifusa	= Sixteenth note 

Beat contradictions



Unmeasured music

Columba Asperxit (Sequentia de sancto Maximo)--1st stanza
by Hildegard von Bingen (1098-1179)
published by Hildegard Publishing Co.



Pitch accents (Jones, Pfordresher, 2003)

“Melodic” vs. “rhythmic” accent

- ▶ First, last pitches in phrase
- ▶ Highest, lowest pitches in phrase
- ▶ Various combinations of these in judgments of melodic similarity



Cf. Essen software for folk-song research

Hierarchical Aspects of Rhythm

Harmonic Rhythm: Joseph Swain

I. Activity levels

Ex. 4-1. Corelli, Concerto op. 6, no. 8, III, mm. 9-14.

Allegro

Tex.
Phen.
Bass
pitch.

These are the famous three...

2. Rhythm of Harmonic Change

Allegretto

A: I V I
Harmonic rhythm

3. Root rhythm

Ex. 5-3. J. S. Bach, Prelude in A from *The Well-Tempered Clavier*, vol. 2, mm. 1-6.

Root
A E A E A b A c# f# E
A E
A g# A g# A g# A D A D b c# b g# D g# c# E A f# c#
A D b g# A

Harmonic rhythm (Swain), cont.

5a. Density + Function

Ex. 7-5. Vivaldi, Concerto op. 8, no. 4, "Winter," I, mm. 1-12.

Allegro non molto

Root

Density

Function

f: I

f: I

5

Root

Density

Function

f: V

f: I

Harmonic rhythm (Swain), cont.

4. Density

Ex. 6-1. Debussy, Prelude no. 1, book 1, "Danseuses de Delphes," mm. 1-10.

Lent et grave (♩ = 44)

doux et soutenu

Root

B \flat a- F+ B \flat a- F+ B \flat b- c

Density

B \flat

6. Final tiered view

Ex. 9-1. J. S. Bach, A Major Prelude from *The Well-Tempered Clavier*, vol. 2, mm. 1-6.

Texture

Phenomenal

Bass pitch

Root

A E A E A b A c #f# E f# g#

Density

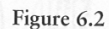
A E

Function

A: I V I V I V I IV V IV V

A: I V

Winograd (1968)



Temperley (Melisma, c. 1999)

