

Horowitz-Faktor, Seite 2007 Mai 2007

Institut für Musikwissenschaft, Universität Wien, VO+KO, 160.302, G 223, G224

Der Horowitz-Faktor

Einführung in die computer-gestützte Performanceforschung

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Organisation

- Online Facilities
 - Mailingliste aller Teilnehmenden: horowitz-2007@goebel.at
 - Online Repository: <http://www.ofai.at/~werner.goebel/lehre>
[Username: "Horowitz" Passwort: "Faktor" (case-sensitive)]
 - Vorlesungsunterlagen
 - PDFs der vorzubereitenden Artikel
- Zeugniserwerb
 - Schriftliche Prüfung (30. Mai 2007, 8:00 Uhr s.t., HS 1)
 - Ersatztermine nach Bedarf
 - Ersatzweise schriftliche Arbeit, nur in Ausnahmefällen!
 - Textstudium (3 papers vorbereiten, siehe online rep.)
 - Anwesenheit (für KO-Anteil), insges. 30% der gesamten Veranstaltung

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Terminplan

Di., 17. April	Mi., 18. April	Fr., 20. April	Di., 22. Mai	Mi., 23. Mai	Fr., 25. Mai
01 16:30–18:30 Organisatorisches & Introduction History, Overview	02 16:00–17:20 Methods I Audio vs MIDI; Annotation Tempo curves	04 10:30–11:50 Analyses I Production and Perception of Expressive Timing	07 16:30–18:30 Models I Introduction & Todd Model	08 16:00–17:20 Models II KTH Model	10 10:30–11:50 Models IV TBA
	03 17:30–19:00 Methods II Alignment Display	05 12:00–13:00 Analyses II Errors, Average		09 17:30–19:00 Models III Machine Learning Model	11 12:00–13:00 Guest Lecture Dr. Maarten Grachten, www.usi.ch
		06 13:30–15:00 Analyses III Dynamics Asynchronies			12 13:30–15:00 Movements Visual component Motion Capture

Repp, 1995 (points to 04)

Todd, 1992 (points to 07)

Friberg et al., 2006 (points to 09)

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Vorzubereitende Artikel

- Bis Freitag, 20. April 2007
 - Repp, B. H. (1995). "Expressive timing in Schumann's "Träumerei: An analysis of performances by graduate student pianists," *Journal of the Acoustical Society of America* 98(5), 2413–2427.
- Bis Dienstag, 22. Mai 2007
 - Todd, N. P. M. (1992). "The dynamics of dynamics: A model of musical expression," *Journal of the Acoustical Society of America* 91(6), 3540–3550.
- Bis Mittwoch, 23. Mai 2007
 - Friberg, A., Bresin, R., and Sundberg, J. (2006). "Overview of the KTH rule system for musical performance," *Advances in Cognitive Psychology* 2(2–3), 145–161.

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01 Introduction

Einführendes Kapitel:

Clarke, E. F. (2002). "Understanding the psychology of performance." In *Musical Performance: A Guide to Understanding* edited by J. Rink, (Cambridge University Press, Cambridge, UK), pp. 59–72.

Expressive versus Mechanical

Frédéric Chopin (1810–1849): *Etude op.10 Nr.3, E major*

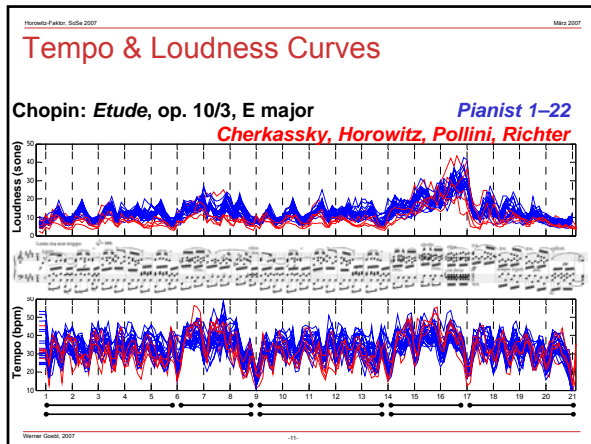


Lento ma non troppo (♩ = 100)



Mechanical rendition of the score (deadpan version): 🎧

Maurizio Pollini 1972 (with click track on 1/16 notes): 🎧



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What Is Expression?

- “The artistic expression of feeling in music consists in esthetic deviation from the regular – from pure tone, true pitch, even dynamics, metronomic time, rigid rhythms etc.”
(Seashore, 1938/67, p. 9, cit. fr. Clarke 2002)
- Expression can be seen as “deviation from norm,” from the exact, mechanical, deadpan rendition
- Can be measured, quantified, and analyzed
- Questions:
 - What is the norm?
 - What, if there is no score?

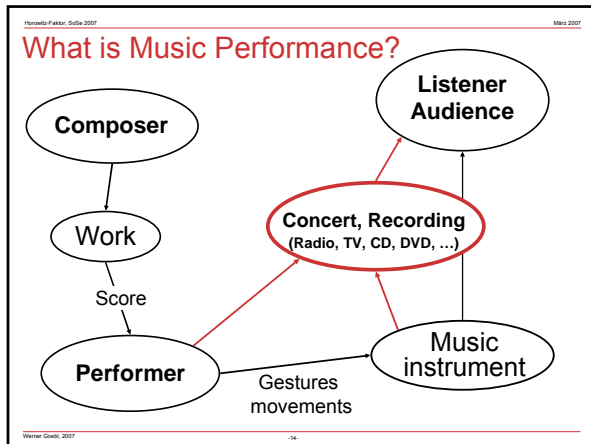
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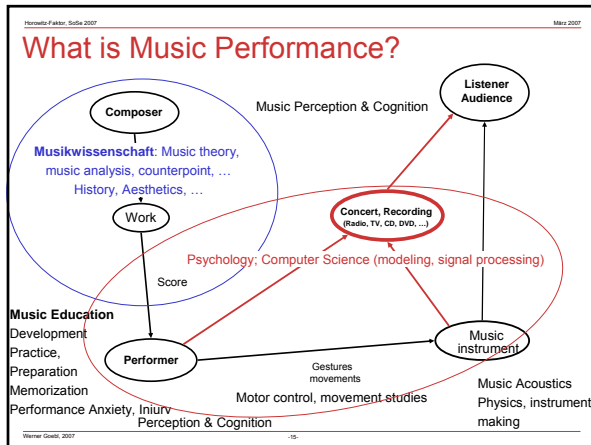
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Study of Expressive Performance

- Commonalities (normative aspect)
 - What share different performances?
 - Are there fundamental principles involved?
 - What is the general basis?
- Diversities (individual aspect)
 - How is one performance different from another?
 - What is typical of one performer (e.g., Horowitz)?

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- ### Types of Music Performance
- All Musics

 - Playing by ear
 - Oral traditions, ...
 - Improvisation
 - in an idiom (e.g., Baroque, Jazz) versus “free”
 - Sight reading from a score
 - Eye-hand span, error correction, pattern recognition
 - Performing a well-learned piece (involves a score)
 - Interpretation of the score
 - Many ambiguities or underspecified elements in a score
 - Music structure (meter, harmony, grouping, ...)
- Western Art Music

What Is Expressed?

- Musical structure, “meaning” (Clarke, 1989)
 - Performers’ (even implicit) understanding of the musical structure
- Conceptual interpretation of the score
 - Many things underspecified, need to be elicited
- Communication process
 - Kendall & Carterette, 1990
 - Normal, exaggerated, mechanical performances
 - Production & perception study
- Emotion, affects
 - Generate emotions, feelings in listeners

Aspects in the Study of Music Performance

- The developing musician
 - Talent, Musical Potential
 - Practicing, Preparation
 - Memorizing (aural, visual, kinesthetic “muscle” mem.)
- Motor Processes
 - Motor theories, Technique
 - Expressive movements
- Sub-skills of performance
 - Music reading, sight-reading
 - Improvisation
 - Ensemble playing & synchronization
- Measurement
- Modeling
- Physical factors
 - Medical problems
 - Hearing impairment
 - Stress factors
- Psychological & social factors
 - Development
 - Personality
 - Music as occupation
 - Performance anxiety
- ...

Brief History I

- First empirical “objective” studies from around 1900
 - Binet & Courtier 1895, rubber tube below keys to record keypress
- Otto Ortmann, 1920ies, Baltimore, Peabody Conservatory
 - Piano key and finger/arm movements
- Carl Emil Seashore, Iowa 1930ies
 - Iowa Piano Camera (Timing, Synchronization, ...)
 - Vibrato Studies (singing, violin)
 - Book “Objective Analysis of Musical Performance” 1936
- Hartmann 1932
 - “Moonlight Sonata” Josef Pembaur vs. Harold Bauer
 - Hupfeld “Animatic Rolls” (reproduction pianos)

Brief History II

- Long break until the 1970ies
- Bengtsson & Gabriellson 1977, Uppsala
 - Timing studies, “systematic variations” (Viennese Waltz, Swedish folk music, ...)
- Shaffer’s Photocell Bechstein 1980ies (Exeter, UK)
 - Structure & performance link
 - Separate motor programs for the two hands (example: Chopin Etude)
 - Synchronization of two pianists
- With the general availability of computers and MIDI instruments → “very topical area of study” (Gab’03, p.224)
 - Gabriellson 1999: 600 papers from 1900–1995
 - Gabriellson 2003: 200 new papers 1995–2002

Outline – Overview of the Course

- Methods
 - MIDI versus Audio (Signal Processing)
 - Annotation tools; Alignment tools
 - Visualization
- Analyses
 - Tempo, Timing, Average Versions, Errors, Dynamics, Asynchronies
- Models
 - What are models for?
 - Movement analogy
 - Todd model, KTH model, ML model
 - Guest lecture: Dr. Maarten Grachten, Uni Linz: “Preserving natural expressivity while you change the tempo of a music performance; How to do it by example?” (case-based reasoning approach)

References

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- Binet, A., and Courtier, J. (1895). “Recherches graphiques sur la musique.” *L’Année Psychologique* 2, 201–222. Available also in a German translation by Schmitz, H.-W. (1994), *Das Mechanische Musikinstrument* 61, 16–24.
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