

Lecture

Music Processing – Analysis

Introduction

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Curriculum Vitae

- 2001 PhD, Bonn University
- 2002/2003 Postdoc, Keio University, Japan
- 2007 Habilitation, Bonn University
“Information Retrieval for Music and Motion”
- 2007-2012 Senior Researcher
Max-Planck Institut für Informatik, Saarland
- 2012: Professor
Semantic Audio Processing
Universität Erlangen-Nürnberg



Group Members

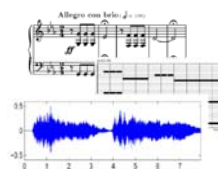
Current PhD students

- Jonathan Driedger
- Thomas Prätzlich
- Nanzhu Jiang
- ...

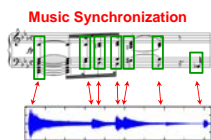


Research

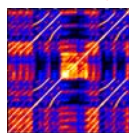
- Music Information Retrieval
- Music Processing
- Motion Processing



Research



Structure Analysis



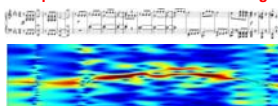
Score-Informed Source Separation



User Interfaces



Tempo Estimation and Beat Tracking

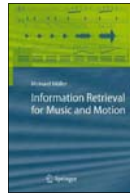


Thanks

- Michael Clausen (Bonn University)
- Frank Kurth (Fraunhofer-FKIE, Wachtberg)
- Sebastian Ewert (Bonn University)
- Peter Grosche (Saarland University)
- Verena Konz (Saarland University)
- Christian Fremerey (Bonn University)
- David Damm (Bonn University)
- Verena Thomas (Bonn University)
- Jonathan Driedger (University of Erlangen-Nürnberg)
- Thomas Prätzlich (University of Erlangen-Nürnberg)
- Nanzhu Jiang (University of Erlangen-Nürnberg)

Selected Publications

- M. Müller, N. Jiang, P. Grosche (2013): **A Robust Fitness Measure for Capturing Repetitions in Music Recordings With Applications to Audio Thumbnailing.** IEEE Trans. on Audio, Speech & Language Processing, Vol. 21, No. 3, pp. 531-543.
- M. Müller, M. Goto, M. Schedl (Eds.): **Multimodal Music Processing.** Dagstuhl Follow-Ups 3, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Germany 2012.
- M. Müller, P.W. Ellis, A. Klapuri, G. Richard (2011): **Signal Processing for Music Analysis.** IEEE Journal of Selected Topics in Signal Processing, Vol. 5, No. 6, pp. 1088-1110.
- P. Grosche and M. Müller (2011): **Extracting Predominant Local Pulse Information from Music Recordings.** IEEE Trans. on Audio, Speech & Language Processing, Vol. 19, No. 6, pp. 1688-1701.
- M. Müller, M. Clausen, V. Konz, S. Ewert, C. Fremerey (2010): **A Multimodal Way of Experiencing and Exploring Music.** Interdisciplinary Science Reviews (ISR), Vol. 35, No. 2.
- M. Müller and S. Ewert (2010): **Towards Timbre-Invariant Audio Features for Harmony-Based Music.** IEEE Trans. on Audio, Speech & Language Processing, Vol. 18, No. 3, pp. 649-662.
- F. Kurth, M. Müller (2008): **Efficient Index-Based Audio Matching.** IEEE Trans. Audio, Speech & Language Processing, Vol. 16, No. 2, 382-395.
- M. Müller (2007): **Information Retrieval for Music and Motion.** Monograph, Springer, 318 pages



Where are we?

Where are we?



Fraunhofer-Gesellschaft

- Europe's largest organization for applied research
- 18,000 employees worldwide, total budget: 1.5 billion €
- 60 institutes covering a broad range of research areas

Fraunhofer Institute for Integrated Circuits IIS

- Largest Fraunhofer institute
- Staff >700 people
- MP3



Where are we?



Friedrich-Alexander Universität Erlangen-Nürnberg (FAU)

- One of Germany's largest universities
- More than 35,000 students

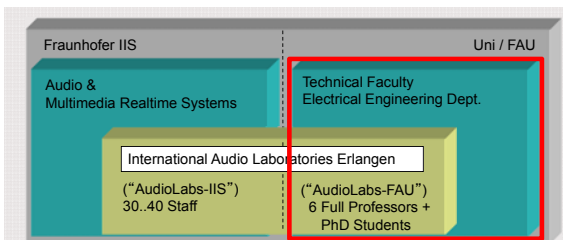


Collaboration between FAU and Fraunhofer IIS

- Roots of "MP3" audio compression scheme
- Research on audio coding in Erlangen since 1981

Where are we?

International Audio Laboratories Erlangen (AudioLabs)



Who are we?

International Audio Laboratories Erlangen (AudioLabs)

- "Audio Coding"
- "Transform Coding"
- "Acoustic Signal Processing"
- "Speech Coding"
- "Music Signal Processing"



Related Courses

Audio Processing **Laboratory**

Hands on experience with

- Pitch Estimation
- Speech Analysis
- Speech Synthesis
- Audio Coding
- Statistical Methods for Audio Experiments

Dates:

~~24.10., 10:15 – 1. Meeting~~

Registration still open - Talk to us!

December – course material is available

January – lab course begins

Audio Processing **Seminar**

Interesting topics in audio processing

- Speech Synthesis and Analysis
- Source Separation
- Pitch Estimation
- Psychoacoustics
- ...

Dates:

28.10., 10:15 – 1. Meeting

End of November – Midterm Pres.

Mid of December – Final Presentation



Registration on studOn is mandatory!

Related Courses

▪ **Speech Enhancement**

Prof. Dr. Emanuel Habets

Do, 14:15 - 15:45, 3R4.04 (AudioLabs); from 31.10.2013

▪ **Ausgewählte Kapitel der Audiodatenreduktion [AKADR]**

Prof. Dr. Jürgen Herre

Fr, 14:30 - 17:45, 3R4.04 (AudioLabs); from 25.10.2013

▪ **Music Processing – Synthesis**

Prof. Dr.-Ing. Rudolf Rabenstein

Di 10:15 - 11:45, N 5.17 (Campus)

Lecture: Music Processing – Analysis

http://www.audiolabs-erlangen.de/meinard/teaching/ws2013_mpa/

- Dates & Material & Information ... → see website!
- Time: Mo 16-18:30
- Mandatory elective course for CME and I&K
- Credits: 2,5 ECTS
- Oral exam at the end of the semester