

Lecture  
Music Processing Analysis (MPA)

### Introduction

**Meinard Müller**  
International Audio Laboratories Erlangen  
meinard.mueller@audiolabs-erlangen.de



### Meinard Müller



- Mathematics (Diplom/Master)  
Computer Science (PhD)  
Information Retrieval (Habilitation)  
**Bonn University**
- Combinatorics (Postdoc)  
**Keio University, Japan**
- Senior Researcher  
**Max-Planck Institute, Saarland**
- Professor: Semantic Audio Processing  
**Erlangen-Nürnberg University**



### Group Members

- Michael Krause
- Sebastian Rosenzweig
- Yigit Özer
- Peter Meier (external)



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### Where are we?

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- Friedrich-Alexander Universität Erlangen-Nürnberg (FAU)
- One of Germany's largest universities with ≈ 40,000 students
- Strong Technical Faculty

## Where are we?



- Fraunhofer Institute for Integrated Circuits IIS
- Largest Fraunhofer institute with ≈ 1000 members
- Applied research for sensor, audio, and media technology



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**AUDIO  
LABS**

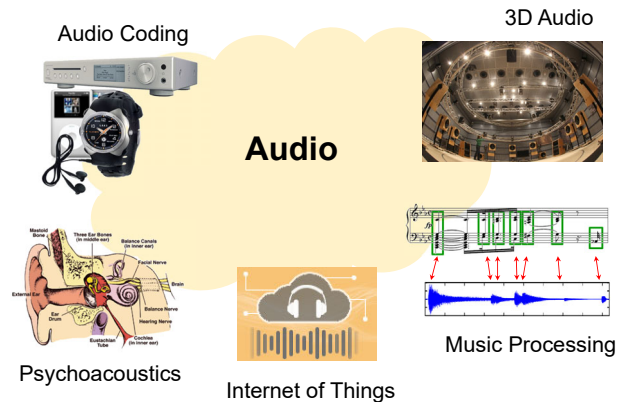


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## International Audio Laboratories Erlangen



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## AudioLabs – FAU

- Prof. Dr. Jürgen Herre  
Audio Coding
- Prof. Dr. Bernd Edler  
Audio Signal Analysis
- Prof. Dr. Meinard Müller  
Semantic Audio Processing
- Prof. Dr. Emanuel Habetz  
Spatial Audio Signal Processing
- Prof. Dr. Nils Peters  
Audio Signal Processing
- Dr. Stefan Turowski  
Coordinator AudioLabs-FAU



## Related Courses

### Audio Processing Laboratory

The objective of this lab course is to give students a hands on experience in audio processing.

- Offered every semester
- Short-Time Fourier Transform
- Speech Enhancement
- Statistical Methods
- Speech Analysis
- ...

Registration via StudOn is mandatory!

### Audio Processing Seminar

Various applications within audio and acoustic signal processing.

- Offered every semester
- Advanced topics
- Require lecture on DSP, audio, ...
- Also music-related topics
- ...

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Registration on studOn is mandatory!

## Related Courses

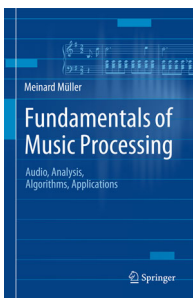
- **Speech Enhancement**  
Prof. Dr. Emanuel Habets  
AudioLabs
- **Advanced Topics in Perceptual Audio Coding**  
Prof. Dr. Jürgen Herre  
AudioLabs
- **Music Processing – Synthesis**  
Maximilian Schäfer (Prof. Dr.-Ing. Rudolf Rabenstein)  
Lehrstuhl für Digitale Übertragung (LMS)

## Lecture: Music Processing Analysis (MPA)

[https://www.audiolabs-erlangen.de/fau/professor/mueller/teaching/2021w\\_mpa](https://www.audiolabs-erlangen.de/fau/professor/mueller/teaching/2021w_mpa)

- Dates, Material, Information ... → [See website!](#)
- Time (Lecture): Mo 16-18
- Time (Exercise): Mo 14-16
- Mandatory elective course for CME, I&K, EEI, and ASC  
Credits: 2,5 ECTS (Lecture MPA)
- Elective course for CME  
Credits: 5 ECTS (Lecture & Exercise, MPA-LE)
- Vertiefungsmodul Informatik (Master of Science)  
Credits: 5 ECTS (Lecture & Exercise, MPA-LE)
- Oral exam

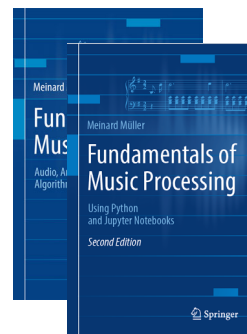
## Book: Fundamentals of Music Processing



Meinard Müller  
Fundamentals of Music Processing  
Audio, Analysis, Algorithms, Applications  
Springer, 2015

Accompanying website:  
[www.music-processing.de](http://www.music-processing.de)

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**2nd edition**  
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**Fundamentals of Music Processing**  
**Using Python and Jupyter Notebooks**  
Springer, 2021

## Book: Fundamentals of Music Processing

Chapter	Music Processing Scenario
1	Music Representations
2	Fourier Analysis of Signals
3	Music Synchronization
4	Music Structure Analysis
5	Chord Recognition
6	Tempo and Beat Tracking
7	Content-Based Audio Retrieval
8	Musically Informed Audio Decomposition

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## Software & Audio: FMP Notebooks

**FMP Notebooks**  
Python Notebooks for Fundamentals of Music Processing

The FMP notebooks offer a collection of educational material closely following the textbook [Fundamentals of Music Processing \(FMP\)](#). This is the starting website, which is opened when calling <https://www.audiolabs-erlangen.de/FMP>. Besides giving an [overview](#), this website provides information on the license, the main contributors, and some links.

<https://www.audiolabs-erlangen.de/FMP>