Tutorial 5, ISMIR
Milan, November 5, 2023

Learning with Music Signals: Technology Meets Education

Overview

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International Audio Laboratories Erlangen
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- Mathematics (Diplom/Master, 1997)
- Computer Science (PhD, 2001)
- Information Retrieval (Habilitation, 2007)
- Senior Researcher (2007-2012)
- Professor Semantic Audio Processing (since 2012)
- Former President of the International Society for Music Information Retrieval (MIR)
- IEEE Fellow for contributions to Music Signal Processing

Meinard Müller: Research Group
Semantic Audio Processing

- Yigitcan Özer
- Simon Schirl
- Johannes Zeiler
- Peter Meier
- Sebastian Strahl
- Uli Benedix
- Chi-Cheung Sun
- Vlora Arifi-Müller
- Michael Krause
- Christina West
- Sabrina Rosenmair
- Frank Zalkow
- Hendrik Schraube
- Christian Dittmar
- Stefan Salie
- Jonathan Driedger
- Thomas Prätzlich

International Audio Laboratories Erlangen

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

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

Music Processing: A Multifaceted Research Area

- Music ... important part of our lives ...
- ... Spotify, Pandora, iTunes, ...
- interdisciplinary research
- intuitive entry point to education

Fundamentals of Music Processing (FMP)

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

Accompanying website:
www.music-processing.de

Schedule
- Part 0: Overview
- Part I: Music Retrieval
- Coffee Break
- Part II: Audio Decomposition
- Part III: FMP Notebooks

Slides/Material:
https://www.audiolabs-erlangen.de/meinard
https://www.audiolabs-erlangen.de/FMP
Fundamentals of Music Processing (FMP)

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

Accompanying website:
www.music-processing.de

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

FMP Notebooks: Education & Research

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

References (FMP Textbook & Notebooks)

  https://www.mdpi.com/2624-6120/2/2/18
  https://zenodo.org/record/3527872#.YOhEQOgzaUk

Resources (Group Meinard Müller)

- FMP Notebooks:
  https://www.audiolabs-erlangen.de/FMP
- libfmp:
  https://github.com/meinardmueller/libfmp
- synctoolbox:
  https://github.com/meinardmueller/synctoolbox
- libtsm:
  https://github.com/meinardmueller/libtsm
- Preparation Course Python (PCP) Notebooks:
  https://www.audiolabs-erlangen.de/resources/MIR/PCP/PCP.html
  https://github.com/meinardmueller/PCP

Resources

- librosa:
  https://librosa.org/
- madmom:
  https://github.com/CPJKU/madmom
- Essentia Python tutorial:
  https://essentia.upf.edu/essentia_python_tutorial.html
- mirtdata:
  https://github.com/mir-dataset-loaders/mirtdata
- open-unmix:
  https://github.com/sigsep/open-unmix-pytorch
- Open Source Tools & Data for Music Source Separation:
  https://source-separation.github.io/tutorial/landing.html