Introduction to Audio Content Analysis
Module 0.0: Introduction to the online course

alexander lerch

Georgia Tech | **Center for Music Technology**
College of Design
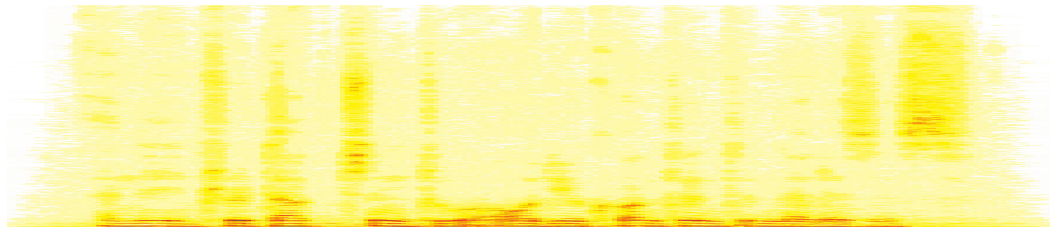
introduction
about alexander lerch

- **education**
    - Electrical Engineering (Technical University Berlin)
    - Tonmeister (University of Arts Berlin)

- **professional**
    - Associate Professor at the Georgia Tech Center for Music Technology
    - previous: CEO at zplane.development

- **research focus**
    - Music Information Retrieval (MIR)
    - intelligent music software

links to optional resources will appear here → Lerch's online profile

introduction
course introduction

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- Audio Content Analysis and Music Information Retrieval (MIR):
- extract and infer descriptors from music signals
- answers questions and tasks such as
  - "What is the tempo/key/mood of this song?"
  - "Transcribe this signal into a musical score."
  - . . .

- MIR is commercially interesting for, e.g.,
  - music recommendation
  - music identification
  - intelligent music production
  - automatic music generation

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introduction
course goals

after successful completion of this course, you will

1. have a good **overview of typical tasks** in MIR
2. **understand algorithmic approaches** in a large variety of basic MIR systems
3. be able to **implement MIR systems** in Matlab
4. be able to **formally evaluate** systems with common datasets and metrics

introduction
course overview

the course is structured into 9 different topic areas

1. Introduction to ACA and MIR
2. Fundamentals of DSP
3. Instantaneous (Low-Level) Features
4. Analysis of Intensity
5. Tonal Analysis
6. Temporal Analysis

7. Alignment
8. Genre, Similarity, & Mood
9. Audio Fingerprinting

introduction
prerequisites

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- basic knowledge in **DSP**
  - signals & systems, block diagrams, . . .

- familiarity with **Matlab**
  - m-files and functions, scripting, file I/O, . . .

- helpful: knowledge of **machine learning** concepts
  - classification & regression, training and testing, evaluation metrics

introduction
course materials & resources

- **text book**: "An Introduction to Audio Content Analysis":
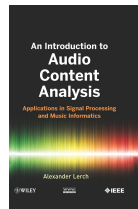 ieeexplore.ieee.org/servlet/opac?bknumber=6266785

- **optional reading**
  - Mueller, M. "Fundamentals of Music Processing". Springer (2015)
  - Li, T., Ogihara, M. and Tzanetakis, G. (Eds.) "Music Data Mining". CRC Press (2012)
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- **online resources** @AudioContentAnalysis.org:
  - slides
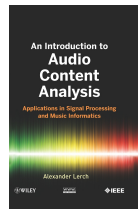 - datasets
  - matlab code
  - python code

- **software**: Matlab, Python 3

www.AudioContentAnalysis.org

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course materials & resources

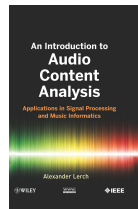- **text book**: "An Introduction to Audio Content Analysis":
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An Introduction to
Audio Content Analysis

Applications in Signal Processing
and Music Informatics

Alexander Lerch

WILEY   IEEE

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