music informatics group
overview

alexander lerch

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College of Design

about
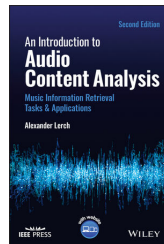self-introduction

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

- **professional**
  - Associate Professor at the School of Music, Georgia Institute of Technology
  - 2000-2013: Head of Research at zplane.development

- **background**
  - audio algorithm design (20+ years)
  - commercial music software development (10+ years)
  - entrepreneurship (10+ years)

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introduction
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- **mission**
  - create new technologies transforming and improving how we *make, produce, perform, discover, and consume music*
  - advance the field of AI for audio through *informed, knowledge-driven machine learning*

- **objectives**
  - enable/improve *machine understanding of music* and musical language
  - create *interpretable and controllable systems*
  - design algorithms with *low data requirements*

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tasks
selected tasks of interest

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- **audio content analysis**
  - music/audio classification
    - ▶ genre/events [1], [2]
    - ▶ instruments [3]–[5]
    - ▶ tagging [5], [6]
    - ▶ pedestrians [7]
  - music transcription
    - ▶ drum transcription [8]
    - ▶ chord detection [9]
  - music performance analysis
    - ▶ student assessment [10]
- **audio processing**
  - source separation [11], [12]
- **sound and music generation**
  - controllable systems [13]
  - evaluation [14], [15]

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methods
methods of interest

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- **representation learning**
  - improved structure of embedded representations [16], [17]
  - enforcing the meaning of specific embedding dimensions [13], [14]
  - …

- **low-resource machine learning**
  - semi- and self-supervised learning [3], [18]
  - reprogramming [2], [4]
  - knowledge transfer [5], [6], [19]

- **objective system evaluation**
  - evaluation of controllable systems with correlated attributes [15], [20]
  - statistical models for comparison of properties [21]
  - metrics for sound generation [22]

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links

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links

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book: www.AudioContentAnalysis.org

references II
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