Introduction to **Audio Content Analysis**

Module 2.0: Audio Content Analysis Process

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Georgia Tech | Center for Music Technology
College of Design

introduction
overview

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corresponding textbook section

chapter 2

- **lecture content**
  - audio content
  - processing steps in a typical ACA system
- **learning objectives**
  - discuss typical forms of content in an audio signal
  - describe the typical signal flow in an ACA system

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audio content

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audio content

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   - "blue-print" of the music
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audio content

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   - unique acoustic rendition
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3. **production**:
   - aesthetic choices
   - editing & processing
   - *examples*: sound quality (EQ, microphone positioning), changes in timing and pitch

audio content
categories

audio content can be structured into **4 basic categories:**

1. **tonal**: related to pitch
   - *examples*: melody, chords, intonation, vibrato, ...
2. **timbral**: related to sound quality
   - *examples*: instrument(ation), playing technique, venue, audio processing, ...
3. **intensity-related**: related to musical dynamics
   - *examples*: accents, loudness, ...
4. **temporal**: related to rhythm and tempo
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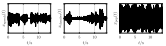
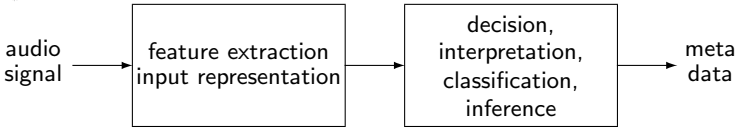
other non-musical content descriptions: e.g., statistical, technical

audio content analysis

system overview





feature representation

- compact and non-redundant
- task-relevant
- easy to analyze

classification/inference

- map or convert feature to comprehensible domain

audio content analysis

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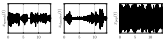

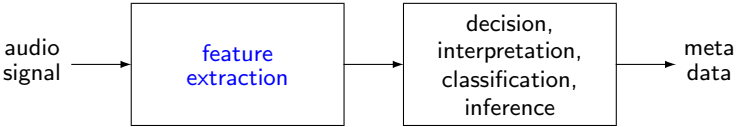

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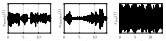

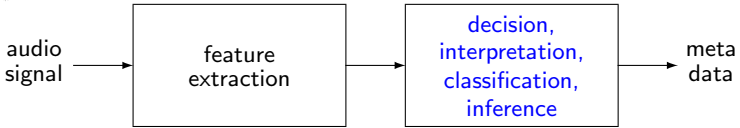

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summary
lecture content

- **audio content**
  - is shaped by the musical ideas (score), the music performance, and the (studio) production
  - can relate to timbre, pitch, intensity, tempo and rhythm (but there is both lower level and higher level content)

- the **flow chart of an ACA system** at its most fundamental level shows
  - a feature extraction step to extract meaningful descriptors
  - a classification or inference step to produce a "human" result