Encoding Music Text and Text with Music

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Introduction

- Text is central to humanities disciplines, musicology included.
(arguably) common objects of observation in musicology

**Notated music**

- Printed
- Manuscript
- Ethnographic transcription
(arguably) common objects of observation in musicology

**Performance**

- “Live”
- Recorded
• (arguably) common objects of observation in musicology

**Historical Sources**

- composer-centric
- social- / reception-centric
• Many kinds of “text”, but on different domains

• Music is **multimodal**

• **What is useful to digitize?**
• Many kinds of “text”, but on different domains

• Music is **multimodal**

• **What is useful to digitize?**

M. Babbit (1965) *The use of Computers in Musicological Research*
• Digitization of the Graphemic Domain

**Score data**

M. Babbit (1965) *The use of Computers in Musicological Research*
Digital Scores Today

Notation and computers, old business

Score formatting > print

Sibelius  Finale  SCORE
Score formatting > print

Lilypond  Software independent
Interchange

- MusicXML ➔ Software independent
Digital distribution

- Mostly PDF
- Download and print
- IMSLP
Digital consumption... ?

Source: http://airturn.com/ All rights reserved
Digital consumption... ?

Source: http://airturn.com/ All rights reserved
Digital consumption... ?
Digital consumption... ?

Morning Shine

Op.13, #9

Gravis Sung

Allegro molto
Digital consumption...?

Open Goldberg Variations

Aria
Digital consumption... ?

Source: http://dme.mozarteum.at/DME  All rights reserved
Analysis

- Identify structures, patterns, topics
- Explain why the text is what it is
- Harmony, melody, rhythm, etc.
Computational Analysis

- Several formats are used successfully
  - MIDI, MusicXML, Humdrum
- Harmonic, melodic, rhythmic
- Similarity, machine learning
- Music Information Retrieval

Complex, difficult, but:
- minimal information needed.
- Pitch / Rhythm
Analysis - Humdrum (Kern)

Vivaldi Violin Concerto n.5 in E-flat Major

- PDF Score
- Source Humdrum
- Understanding Humdrum's structure
Analysis - Humdrum (Kern)

Source: http://extras.humdrum.org/man/mkeyscape/wtc/
• Music Information Retrieval (MIR) and computational analysis of score data

Complex and less explored by “digital” scholars

Focus on these components

Score data

Pitch, Tempo data
• Music Information Retrieval (MIR) and computational analysis of score data

Musicology is potentially a data rich discipline
Descriptive markup for music

- Text

    Presentational markup:

    ```html
    <body>
    <h1><i>Money</i> by <b>Martin Amis</b> </h1>
    <p>Some text...</p>
    </body>
    ```

    Descriptive markup:

    ```html
    <book>
    <header><title>Money</title> by <author>Martin Amis</author></header>
    <p>Some text...</p>
    </book>
    ```
• Music

• Music language is not semantic
  (not like language is, at least)
• However, descriptive markup is still useful:

  “Small notes” vs “alternative”

Carl Maria von Weber
Der Freischütz
No. 13, m. 63, soprano (Änchenn)
• Music

• Anything on the text that requires commentary
  intervention
  disambiguation
  interpretation
Modelling interpretation – critical editions

- Printed critical editions
  - “Clear” text performance is top priority
  - Some important commentary in-score
  - Critical report in apparatus
Digital Editions

- MS
- Copy
- A
- B

Text criticism

Digital model

- History of sources
- Collation
- Variants
- Digital facsimile
- Recorded performances
- External digital resources

Web Application
- Transcription + Interactive Apparatus

Faceted Browsing
- Semantic Web...

Printed Critical Edition
Digital Editions

- Non-linear access to notation is less useful than to text
  - (indexes are as useful)
- Performers “deliver” the text
  - Interpretation
  - Useful to be able to compose a different text from the choices available
- A simple example: Palmer's performative edition of Bach's *Inventions and Sinfonias*
  - Data from performances
  - Resolutions, fingering, other performative instructions
Digital Editions

- Simple example: Debussy's *Syrinx*
  - Flute solo
  - Very few breath marks
  - Turn on-off breath marks by famous performer(s)

http://legacy.cch.kcl.ac.uk/syrinx
Music Encoding Initiative (MEI)

- Focus on scholarly text encoding
- Inspired by the TEI
- Community of scholars
Hello World in MEI – some preliminary considerations
Hello World in MEI part 1 - setting the score

```xml
<mei>
  <meihead> ... </meihead>
  <music>
    <body>
      <mdiv>
        <score>
          <scoredef meter.count="4" meter.unit="4" key.mode="major">
            <staffgrp>
              <staffdef n="1" xml:id="P1" lines="5" clef.line="2"
                clef.shape="G"/>
            </staffgrp>
          </scoredef>
        </score>
      </mdiv>
    </body>
  </music>
</mei>
```
Hello World in MEI part 2 – the notes

<score>
  <scoredef> ... </scoredef>
  <section>
    <measure n="1" xml:id="m1">
      <staff n="1">
        <layer n="1">
          <note xml:id="m1n1" pname="c" oct="4" dur="4" stem.dir="up"/>
          <note xml:id="m1n2" pname="e" oct="4" dur="4" stem.dir="up"/>
          <note xml:id="m1n3" pname="g" oct="4" dur="4" stem.dir="up"/>
          <note xml:id="m1n4" pname="c" oct="5" dur="4" stem.dir="down"/>
        </layer>
      </staff>
    </measure>
  </section>
</score>
<measure n="12">
  <staff>
    <layer>
      <!-- ... -->
      <beam>
        <note pname="b" oct="4" dur="8" stem.dir="down" xml:id="n11"/>
        <tuplet num="3" num.base="2" num.place="below" num.format="count">
          <note pname="d" oct="5" dur="16" stem.dir="down" xml:id="n12"/>
          <note pname="e" oct="5" dur="16" stem.dir="down" xml:id="n13"/>
          <note pname="g" oct="5" dur="16" stem.dir="down" xml:id="n14"/>
        </tuplet>
      </beam>
    </layer>
  </staff>
</measure>
Text and Music

- Music notation occurs often within text across ages
- Enters text flow similarly to figures, images or graphs
- Or characters in running text

1. TEI: how to markup the presence of music notation?
2. Is the notation influenced by the text surrounding it?
3. How to reflect this in music encoding?
**TEI and music**

- `<musicNotation>` in Manuscript Description module
  A metadata element to describe what kind of music notation is in the text.
  Can be used with `<locus>`
TEI and music

- `<notatedMusic>` marks the presence of music notation within the text
- Refers to external representation
- Put together by the Music Special Interest Group
- http://www.tei-c.org/SIG/Music/
I have chosen, in these three, characteristic and peculiarly happy examples of what we might call, in XVIIIth century phrase, music “de tendres plaintes.” Now I must ask leave to make a big jump forward and compare with these three pieces a modern master’s expression of the same sentiment. What better example could one find than that short piece of Debussy—‘La Flute de Pan,’ which reaches piquant melancholy by the very simplest means.

Ex. 5. Debussy, La Flute de Pan

The whole piece would be worth quoting. There is no repetition of theme, no reminiscence; nothing of the kind. And just as it was easy, in spite of the absence of any programme, to discover a feeling of melancholy in the three pieces just mentioned, so with this piece of Debussy, programme music as it is—in fact, a lament was exactly what the composer had to express—this modern master uses, you see, exactly the same technique; he has a long-breathed phrase, he employs the lower octave, he indulges in no temperamental explosions, he confines himself to the severest and soberest expression of great mental suffering.

… that short piece of Debussy-"La Flute de Pan," which reaches piquant melancholy by the very simplest means.

The whole piece would be worth quoting. There is no repetition of theme, no reminiscence; …
la prevalenza nel soggetto iniziale di figurazioni e note ribattute con il seguente modulo ritmico:

\[ \begin{array}{ccccccc}
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
\end{array} \]

; oppure

\[ \begin{array}{ccccccc}
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
\end{array} \]

; o ancora

\[ \begin{array}{ccccccc}
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
\end{array} \]

• Every `<notatedMusic>` points to an external file, i.e. a full MEI encoding.
• With some ODD magic, we can include MEI at the right place:

```xml
<body>
  <p>... that short piece of Debussy-"La Flute de Pan," which reaches piquant melancholy by the very simplest means.</p>
  <figure>
    <head><label>Ex. 5.</label> Debussy, La Flute de Pan</head>
    <notatedMusic>
      <mei:mdiv>
        <mei:score>
          <mei:scoredef>...</mei:scoredef>
          <mei:section>
            <mei:measure>...</mei:measure>
          </mei:section>
        </mei:score>
      </mei:mdiv>
    </notatedMusic>
  </figure>
  <p>The whole piece would be worth quoting. There is no repetition of theme, no reminiscence; ... </p>
</body>
```
la prevalenza nel soggetto iniziale di figurazioni e note ribattute con il 
seguente modulo ritmico:

<notatedMusic>
  <mei:layer>
    <mei:note dur="2"/>
    <mei:note dur="4"/>
    <mei:note dur="4"/>
    <mei:barline rend="single"/>
    <mei:note dur="2"/>
  </mei:layer>
</notatedMusic>; oppure
<notatedMusic> ... </notatedMusic>; o ancor
<notatedMusic> ... </notatedMusic>
Overview

- Digital Humanities and Musicology
- Business and research around digital scores
- Descriptive markup for music notation (MEI)
- Combining text and music (TEI, TEI + MEI)
Thank you!

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