Exploiting Musical Connections: A Proposal for Support of Work Relationships in a Digital Music Library

Jenn Riley
Metadata Librarian
Indiana University Digital Library Program
Academic music libraries

- Faculty and students need materials for performance and research
- Materials increasingly digital
- Heavy emphasis on known-item searching
- But support for exploration to discover previously unknown music is also important
Discovery of music in libraries

- The physical item is the basis of description
- Cataloging rules and record format not originally designed for music
- Cataloging practice does not take advantage of all possibilities of record format
- Some specific problems for music
  - Most often individual works on a multi-work item are not explicitly identified
  - Contributors not connected to individual works
  - Instrumentation not handled well
Variations2 @ Indiana University (1)

- Federally-funded multi-year, multi-million dollar project
- Digital music library testbed system
- Research areas
  - Copyright
  - Metadata
  - Music instruction & course management systems
  - Music theory instruction
  - Networking
  - System design
  - Usability
Multiple formats represented

Audio
Scanned score images
Some encoded scores

Metadata is human-generated, or mapped from other human-generated metadata

Includes tools for using digital objects in instruction

Work-centric metadata model matches well to music in the Western canon of art music
is represented by

represents a piece of digital media content (e.g., sound file, score image)

represents the physical item or set of items on which one or more instantiations of works can be found (e.g., CD, score)

represents a manifestation of a work as a recorded performance or a score

represents the abstract concept of a musical composition or set of compositions

represents people or groups that contribute to a work, instantiation, or container

is created by

CONTRIBUTOR

is represented by

MEDIA OBJECT

is enclosed in

INSTANTIATION

is manifested in

WORK

CONTAINER
Work relationships

- Significant research into work relationships and bibliographic relationships
- Two relationships most frequent in music of the Western canon
  - Derivative relationship: between a source work and a derivative work based in some way on the source work
  - Whole-part relationship: between a parent work and a child work that is completely enclosed in the parent
Current Variations2 implementation

- Specified relationships
  - Four types
    - isVersionOf
    - hasVersion
    - isPartOf
    - hasPart
  - Not reciprocal
  - Doesn’t do anything
  - Not immediately visible to end-users
- Hierarchical work structure
Need for something different

- “Parts” of works need multiple titles, keys, other properties of works
- Users access different parts of works for different needs
- Different versions of works have different structures, but users don’t know the difference between them
Our proposal

- Functional requirements for how to act on known relationships between works
- Covers derivative and whole-part relationships
- Defines system behavior for recording, maintaining, and using the relationship in retrieval
Derivative relationships: definition

- Between one source work and one derivative work
- Includes arrangements, versions, medleys, free interpretations
- Run from very strong to very weak
- Fully reciprocal
- Arbitrary number of derivatives per source, arbitrary number of sources per derivative
- Can occur simultaneously with whole/part relationship
Derivative relationships: query matching and display (1)
Derivative relationships: query matching and display (2)

Display derivative work together with its source

<table>
<thead>
<tr>
<th>Query:</th>
<th>copland and mexico and piano</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work title:</td>
<td><strong>Salón México; arr.</strong></td>
</tr>
<tr>
<td>Composer:</td>
<td><strong>Copland, Aaron</strong>, 1900-1990</td>
</tr>
<tr>
<td>Instrumentation:</td>
<td>Piano</td>
</tr>
</tbody>
</table>
| Derived from: | **Salón México**
**Copland, Aaron** 1900-1990
Orchestra |

Need to display multiple results meaningfully
Derivative relationships: query matching and display (3)
Derivative relationships: query matching and display (4)

- Display source work in the result set
- Allow user to display all derivative works for that source

**Query:** bach and sonata and 1001

**Work title:** Sonaten und Partiten, violin, BWV 1001-1006. Sonata, no. 1

**Composer:** Bach, Johann Sebastian 1685-1750

**Instrumentation:** Violin

**View derivative works** (3)
Whole-part relationships: definition

- Between a parent work and a child work that is completely enclosed in the parent
- Parts are frequently performable units
- Fully reciprocal
- Arbitrary depth, but a child can have only one parent
- Can occur simultaneously with derivative relationship
- Child work not equivalent to a work structure node
Whole-part relationships: query matching and display (1)
Whole-part relationships: query matching and display (2)

- Return as search results the children matched by the query plus their *immediate* parent works

<table>
<thead>
<tr>
<th>Query: wagner and siegfried and nothung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work title: Nothung! Nothung! Neidliches Schwert!</td>
</tr>
<tr>
<td>Composer: Wagner, Richard 1813-1883</td>
</tr>
<tr>
<td>Part of: Ring des Nibelungen. Siegfried. Wagner, Richard 1813-1883</td>
</tr>
</tbody>
</table>
Whole-part relationships: query matching and display (3)
Whole-part relationships: query matching and display (4)

- Consider the parent the match and display it together with its immediate parent
- After match, allow user to view complete hierarchy
- Matching rules require full Uniform Title to function properly
Next steps

- Actual implementation
- User testing
- Define “version” relationship
- Relationships for other types of materials
More information

- jenlrile@indiana.edu
- These presentation slides: http://www.dlib.indiana.edu/~jenlrile/presentations/ismir2005/
- Variations2 Project Site: http://variations2.indiana.edu