Where’s That Tune?

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Summary

• As a 21st Century Music Librarian, what can you do to improve the opportunities of your users to access music using up-to-date services?
  – The problems of organising music for different audiences
  – Some examples of resources
  – Future systems and applications
Different strokes for different folks

- Casual / recreational
- Professional
- Academic / scholarly

- Different domains require different approaches
Importance of Metadata

• To help: Identify, Discover, Manage, Understand, Explain, Organise

• FRBR
  – Work, expression, manifestation, item
  – Person, corporate body
  – Concept, object, event, place

• Is Artist / Title / Album enough?
Musical content

• Sound:
  – Pitch (frequency)
  – Intensity (loudness - amplitude)
  – Timbre (differentiate between sounds with same pitch and intensity)

• Music
  – Tempo (beats)
  – Tonality (chords)
  – Time signature
  – Key signature
  – Onset / duration / offset
  – Register
  – Horizontal (time) / vertical (harmony)

• Lyrics and title
  – Content / Subject
Musical context

• Genre
• Mood
• Use
  – Film soundtrack
  – Nightclub
  – Restaurant
  – Radio playlist
  – iPod playlist etc
• Budget
• Availability
• Novelty
ID3 V2

- Album/Movie/Show title
- BPM (beats per minute)
- Composer
- Content type
- Copyright message
- Date of recording
- Playlist delay
- Encoded by
- Lyricist/Text writer
- File type
- Time of recording
- Content group description
- Title/songname/content description
- Subtitle/Description refinement
- Initial key
- Language(s) used in the audio
- Length
- Media type of audio original
- Original album/movie/show title
- Original filename
- Original lyricist(s)/text writer(s)
- Original artist(s)/performer(s)
- Original release year
- File owner/licensee
- Lead performer(s)/Soloist(s)

- Band/orchestra/accompaniment
- Conductor/performer refinement
- Interpreted, remixed, or otherwise modified by
- Part of a set
- Publisher
- Track number/Position in set
- Recording dates
- Internet radio station name
- Internet radio station owner
- Size
- ISRC (international standard recording code)
- Software/Hardware and settings used for encoding
- Year of the recording
- User defined text information frame
- **URL link frames**
- Commercial information
- Copyright/Legal information
- Official audio file webpage
- Official artist/performer webpage
- Official audio source webpage
- Official internet radio station homepage
- Payment
- Publishers official webpage
- User defined URL link frame

- Etc (http://www.id3.org/Frames)
Music Ontology

- Classes: AnalogSignal, Arrangement, AudioFile, CD, Composition, CorporateBody, DAT, DCC, DVDA, DigitalSignal, ED2K, Festival, Genre, Instrument, Instrumentation, Label, Libretto, Lyrics, MD, MagneticTape, Medium, Membership, Movement, MusicArtist, MusicGroup, MusicalExpression, MusicalItem, MusicalManifestation, MusicalWork, Orchestration, Performance, PublishedLibretto, PublishedLyrics, PublishedScore, Record, Recording, RecordingSession, Release, ReleaseEvent, ReleaseStatus, ReleaseType, SACD, Score, Show, Signal, SignalGroup, SoloMusicArtist, Sound, Stream, Torrent, Track, Transcription, Vinyl

- Properties: amazon_asin, arranged_in, arrangement_of, available_as, biography, bitsPerSample, bpm, catalogue_number, channels, collaborated_with, compilation_of, compiled, compiler, composed_in, composer, conducted, conductor, contains_sample_from, discography, discogs, djmix_of, djmixed, djmixed_by, download, ean, encodes, encoding, engineer, engineered, event_homepage, exchange_item, fanpage, free_download, genre, grid, group, gtin, homepage, image, imdb, instrument,ipi, ismn, isrc, iswc, item, key, label, lc, licence, listened, listener, mailorder, mashup_of, medley_of, member, member_of, membership, meter, movement, movement_number, musicbrainz, musicbrainz_guid, musicmoz, myspace, olga, onlinecommunity, opus, other_release_of, paid_download, performance_of, performed, performed_in, performer, possess_item, preview, preview_download, primary_instrument, produced, produced_score, produced_signal, produced_signal_group, produced_sound, produced_work, producer, publication_of, published, published_as, publisher, publishing_location, puid, record, record_count, recorded_as, recorded_in, recording_of, records, release_event, release_status, release_type, remaster_of, remix_of, remixed, remixer, review, sample_rate, sampled, sampled_version, sampled_version_of, sampler, sell_item, signal, similar_to, singer, supporting_musician, tempo, text, time, track, track_count, track_number, translation_of, tribute_to, trmid, upc, want_item, wikipedia

- Individuals: album, audiobook, bootleg, compilation, ep, interview, live, official, promotion, remix, soundtrack, spokenword
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<th>Field Clusters</th>
<th>ID3</th>
<th>freeDB</th>
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<th>Dublin Core</th>
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Table 2. Metadata field clusters vs. metadata standards

(Corthaut et al 2008)
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<tr>
<th>Composer</th>
<th>Nationality</th>
<th>Dates</th>
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<td>Wolfgang Amadeus Mozart</td>
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<td>Niccolò Paganini</td>
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<td>Domenico Scarlatti</td>
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<td>Luigi Boccherini</td>
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<td>Stianus Leopold Weiss</td>
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<td>John Dowland</td>
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Music Vocabulary

- Musical_Work
  - Oeuvre
    - Orchestral_Work
      - Symphony
      - Concerto
      - Overture
      - Symphonic_Poem
    - Opera
    - Ballet
    - Suite
    - Religious_Music
  - Chamber_Music
    - String_Quartet
  - Choral_Music
    - Cantata
    - Oratorio
  - Text
  - Movement
- Artist
- MusicalGroup
  - Orchestra
  - Ensemble
  - StringQuartetEnsemble
  - Chorus
  - OperaCompany
  - BalletCompany
- Composer
- Musician
- Player
  - Violinist
  - Violist
  - Cellist
  - Contrabassist
  - Flutist
  - PiccoloPlayer etc

http://www.kanzaki.com/ns/music.rdf
Pandora

- **Music Genome Project**
  - #1 Structures
  - #2 Roots
  - #3 Instrumentation
  - #4 Feel
  - #5 Musical qualities
  - #6 Leanings/stylings
  - #7 Influences
  - #8 Instruments: Bass, Brass, Clapping and human percussion, Drums, Guitars, Horns, Piano, Strings, Synthesisers
  - #9 Lyrical content
  - #10 Vocals: Male, Female

Motion Picture Moods - 1924


(Rappee 1924)
Motion Picture Moods - 2010

aggressive, ambient, angry, angst, anthemic, atmospheric, bittersweet, brooding, calm, carefree, celebratory, confident, dark, depressed, desire, dramatic, dreamy, driven, dynamic, energetic, ethereal, euphoric, exuberant, fiery, funky, funny, graceful, happy, high, intense, joyous, jubilant, light, longing, melancholy, mellow, passionate, reflective, rousing, sad, sentimental, spirited, time, upbeat
Genre

adult  age  alternative  ambient  americana  ballad  band  bass  beat  beats  big  blue  blues  british  christmas  classic  classical  club  coast  comedy  contemporary  country  dance  dark  desire  disco  dramatic  early  easy  electric  electro  electronica  euro  exotica  eyed  fast  female  film  folk  fun  funk  girl  good  gospel  group  guitar  hip  hop  house  indie  instrumental  jazz  latin  life  light  lounge  love  male  medium  memphis  metal  modern  music  neo  new  novelty  orchestral  party  post  psychedelic  punk  rap  reflective  reggae  retro  revival  rockabilly  roll  romantic  singer  slow  smooth  soft  songs  songwriter  soul  southern  surf  swing  teen  time  top  traditional  upbeat  urban  vocal  wave  world
Subject
Applications

• Music library / encyclopedia
• Personal collection management
• Commerce and transactions
• Music editing/production
• Music playback
• Music recommendation
• Music retrieval
• Musical notation

(Corthaut et al 2008)
• *Find me a song that sounds like this*
• *Given that I like these songs, find me more songs that I may enjoy*
• *I need to organize my personal collection of digital music (stored in my hard drive, portable device, MP3 player, cell phone, . . .)*
• *I am looking for a suitable soundtrack for . . .*
• *Retrieve musical works that have a rhythm (melody, harmony, orchestration) similar to this one*
Download stores are great resources

- **iTunes music store**
  - 30 seconds
  - (Mainly) popular music
  - Pay-for-download

- **Amazon**
  - 30 seconds
  - Popular music
  - Pay-for-download

- **E-music**
  - 1 minute
  - More ‘niche’, (more classical)
  - Lots of *information*
  - subscribe
## Download store genres

### iTunes
- Alternative
- Blues
- Children's Music
- Classical
- Comedy
- Country
- Dance
- Electronic
- Hip Hop / Rap
  - Jazz
  - Metal
  - Pop
- R&B/Soul
- Reggae
- Rock
- Singer/Songwriter
- Soundtrack
- Vocal
- World

### Amazon
- Blues
- Children's Music
- Christian & Gospel
- Classic Rock
- Classical
- Country
- Dance & Electronic
- Easy Listening
- Folk
- Hard Rock & Metal
- Hip-Hop & Rap
- Indie & Alternative
- Jazz
- Latin Music
- Musicals & Cabaret
- New Age & Meditation
- Pop
- R&B & Soul
- Reggae
- Rock
- Soundtracks
- World Music
- Miscellaneous

### E-Music
- Alternative/Punk
- Blues
- Classical
- Country/Folk
- Electronic
- Hip-Hop/R&B
- International
- Jazz
- New Age
- Rock/Pop
- Soundtracks/Other
- Spiritual
Use social media for full length tracks, friends and information

- Last.fm
- Myspace
- Youtube
- Facebook
Or streaming media

- Spotify
- Napster
- Naxos
- BBC iPlayer
- Classical.com
B2B
Or other alternatives

- Downloadable music clips ‘royalty free’: user pays one off license to use in film soundtrack or podcast.
- **Read the agreement carefully**
Content-based retrieval

• Metadata may be
  – Poor / insufficient / unreliable / unsuitable
  – Too general / too specific

• Although many digital libraries are text-based

• Future systems may use more content-based tools
Musical content

- **Sound:**
  - Pitch (frequency)
  - Intensity (loudness - amplitude)
  - Timbre (differentiate between sounds with same pitch and intensity)

- **Music**
  - Tempo (beats)
  - Tonality (chords)
  - Time signature
  - Key signature
  - Onset / duration / offset
  - Register
  - Horizontal (time) / vertical (harmony)

- **Lyrics and title**
  - Content / Subject
The future

- Audio description
- Genre classification
- Artist identification
- Artist similarity
- Rhythm classification
- Tempo induction
- Melody extraction
MIREX

• New algorithms are tested in an annual contest known as MIREX
• This encourages cooperation between researchers and reduces duplication of efforts
• Results are made public at ISMIR conference, focus of Music Information Retrieval research
• ISMIR 2010 is in Utrecht Aug 9 – 13.
The future

- Music search
  - Melody retrieval
  - Music filtering
  - Automatic playlist generation
- Music browsing, classification and visualisation
  - Browsing
  - Audio classification
  - Visualisation
- Score following
But for now

• Analyse the information domain
• Reference interviews
• User information needs
• Use commercially available resources creatively
Many thanks!

Questions?
Reading and references


Music Ontology website (http://wiki.musicontology.com/index.php/Classes_Schemas) last accessed 04/03/10

Music Vocabulary website (http://www.kanzaki.com/ns/music.rdf#Orchestral_Work) last accessed 04/03/10


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