

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](#) |

	ID3	freeDB	MusicBrainz	Dublin Core	Music Vocabulary	Music Ontology	MPEG-7	MusicXML
musical info	+	+/-	+/-	-	+/-	+	+	+
classifiers	+/-	+/-	-	+/-	+/-	+/-	+	+/-
performance	+	+/-	+/-	+	+	+	+	+/-
versioning	+	-	-	+	+/-	+	+	-
descriptor	+	+	+	+	+	+	+	+
rights & ownersh.	+	-	-	+	-	+	+	+
playback rendition	+	-	-	-	-	+	+	+
lyrics	+	-	-	-	+	+	+	+
group. & refs.	+	-	-	+	+/-	+	+	+
identifiers	+	+	+	+	-	+	+	-
record-info	+	+	+	-	-	+	+	-
instr. & arrang.	+/-	-	-	-	+	+	+	+
sound & carrier	-	-	-	+	-	+	+	+/-
event	-	-	-	-	+	+	+	-
time-modelling	-	-	-	-	-	+	+	+
notation	-	-	-	-	+/-	+/-	-	+
attention-metadata	+	-	-	-	-	+	+	-
publishing	+	-	-	-	-	+	+	-
composition	+	-	-	+/-	+	+	+	+
production	-	-	-	-	-	+	+	-
meta-metadata	-	+	-	-	-	-	+	-

Table 2. Metadata field clusters vs. metadata standards

(Corthaut et al 2008)



Wolfgang Amadeus **MOZART**
Austrian (1756 - 1791)



Antonio **VIVALDI**
Italian (1678 - 1741)



Johann Sebastian **BACH**
German (1685 - 1750)



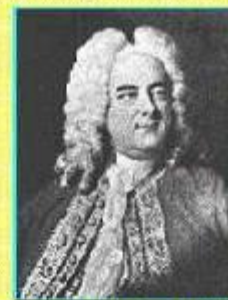
Niccolò **PAGANINI**
Italian (1782 - 1840)



Domenico **SCARLATTI**
Italian (1685 - 1757)



Luigi **BOCCHERINI**
Italian (1743 - 1805)



George Frideric **HANDEL**
German (1685 - 1759)



Gioacchino **ROSSINI**
Italian (1792 - 1868)



Franz Joseph **HAYDN**
Austrian (1732 - 1809)



Simeon Leopold **WEISS**
Polish (1686 - 1750)



John **DOWLAND**
British (1593 - 1626)

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

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

http://en.wikipedia.org/wiki/List_of_Music_Genome_Project_attributes

Motion Picture Moods - 1924

- Aeroplane, Band, Battle, Birds, Calls, Chase, Chatter, Children, Chimes, Dances, Doll, Festival, Fire-fighting, Funeral, Grotesque, Gruesome, Happiness, Horror, Humorous, Hunting, Impatience, Joyfulness, Love-themes, Lullabies, Misterioso, Monotony, Music-box, National, Neutral, Orgies, Oriental, Parties, Passion, Pastorale, Pulsating, Purity, Quietude, Race, Railroad, Religioso, Sadness, Sea-storm, Sinister, Wedding, Western

(Rappee 1924)

Motion Picture Moods - 2010

aggressive ambient angry angst anthemic
atmospheric bittersweet brooding calm carefree celebratory confident dark

depressed desire **dramatic dreamy** driven

driving **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 **pop** post psychedelic punk **rap**
reflective reggae retro revival **rock** rockabilly roll romantic singer slow smooth
soft **songs** songwriter **soul** southern surf swing teen time top **traditional**
upbeat urban **vocal** wave world

Subject

action age air alcohol anthems assurance **baby bad beauty** believe best better big body
box boys bump car **change** cheating child children christmas cities cold come
communication country dance day death **desire** determination **devotion dreams**
drinking driving **drugs** easy emi e nvironment eyes falling fame **family** fire food free
friendship **fun future** gambling girls **good** goodbye
happy heart hello home hot **life** light loss **love**
luck magic memories money more morning **music names**
need **new night** numbers party **people** questions **rain** road **rock** sky
sleep sorry sports **sun** tears things **time** together **travel** want war
water we ather woman work **world you**

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)

Users



- *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



amazon.com.



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

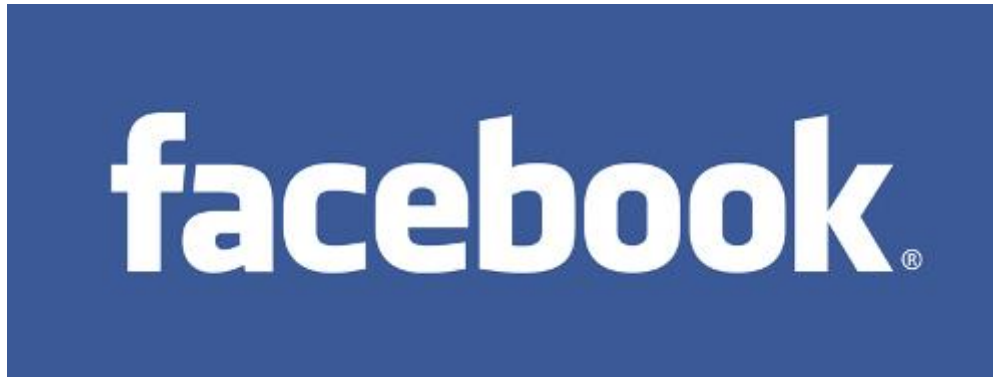
Blues
Children's Music
Christian & Gospel
Classic Rock
Classical
Country
Dance & Electronic
Easy Listening
Folk
Hard Rock & Metal
Hip-Hop & Rap
Indie & Alternative
Jazz
Latin Music
Musicals & Cabaret
New Age & Meditation
Pop
R&B & Soul
Reggae
Rock
Soundtracks
World Music
Miscellaneous

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](#)



napster.



B2B

SONY/ATV MUSIC PUBLISHING

MUSIC SEARCH NEWS WRITERS CONTACT

MUSIC SEARCH

Advanced Search

Basic Search:

SONG:

ARTIST:

GENRE:

LYRICS:

DATE:

KEYWORD:

GENRE:

TEMP:

LOBBY:

CONTACT:

ALTERNATIVE:

SONG:

ARTIST:

GENRE:

LYRICS:

DATE:

KEYWORD:

Home Around the World The Music A & R Solutions Licensing Solutions

SONG SEARCH & LICENSE MY PROJECTS

TOP GENRES ONLY:

ANY COUNTRY:

SEARCH:

LOGIN

SONG SEARCH

WARNER CHAPPELL

SELECT AN AFFILIATE: WarnerChappell UK

SEARCH MUSIC

Source:

Decade: Year (yyyy):

TERMINOLOGY:

WHERE BONCS LIVE

song search & license BY SUBJECT

Select a keyword to view

STEP 1: SELECT A COUNTRY

Licensing fee:

SONG SEARCH

Chrysalis Music

FINO BROWSE KEEP PROJECTS

SEARCH START OVER

UNIVERSAL MUSIC PUBLISHING GROUP

SYNCHEXPRESS

SEARCH

SEARCH FOR UMPG SONGS

ENTER OR SELECT ALL THAT APPLY

ARTIST:

WRITER:

SONG TITLE:

SUBJECT OF LYRICS:

DATE RANGE: TO (Enter 4 digits (ex. 1969))

CHART INFO

POSITION	CHART
All	All
Top 10	Adult Contemporary
Top 20	Alternative Rock
Top 40	BB Top Catalog Albums
Top 50	BB Top Country Albums

YEAR: (Enter 4 digits (ex. 1969))

EASY CLEAR search only Easy Clear songs

WANT TO START OVER?

ricall music licensing

home search login register

Commercial music

Production music

Unsigned music

quick search

creative search

exact:

artist: track: album:

composer: keywords: lyrics:

instrumental:

Click here to search by Activities (0)

Click here to search by Chart Position (0)

Click here to search by Feelings (0)

Click here to search by Genre (0)

Click here to search by Instrument (0)

Click here to search by Moods (0)

Click here to search by Tempo (0)

Featured Artists

Or other alternatives

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



STOCK MUSIC STORE.COM
THE BEST PRODUCTION MUSIC AVAILABLE, PERIOD!

 Magnatune
WE ARE NOT EVIL

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

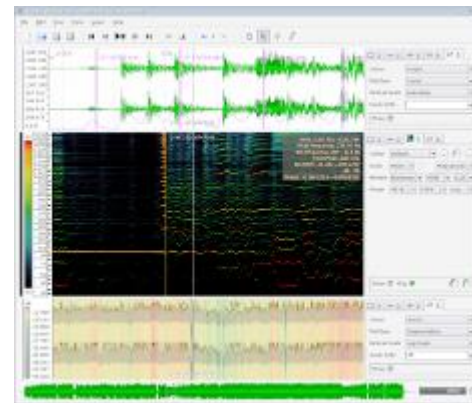
- New algorithms are tested in an annual contest known as MIREX
- This encourages cooperation between researchers and reduces duplication of efforts
- Results are made public at ISMIR conference, focus of Music Information Retrieval research
- ISMIR 2010 is in Utrecht Aug 9 – 13.

The future

- Music search
 - [Melody retrieval](#)
 - [Music filtering](#)
 - [Automatic playlist generation](#)
- Music browsing, classification and visualisation
 - [Browsing](#)
 - [Audio classification](#)
 - [Visualisation](#)
- [Score following](#)



mHashup



But for now

- Analyse the information domain
- Reference interviews
- User information needs
- Use commercially available resources creatively

Many thanks!

Questions?

Reading and references

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