MusicBox: Navigating the space of your music

Anita Lillie
November 19, 2007

The Problem

Navigating large music libraries

- describing preferences with words
- selecting music that fits those preferences
- recommending new music that fits those preferences

Windows Media Player

File View Play Tools Help

Now Playing

Now Playing
Media Guide
Copy from CD
Media Library
Radio Tuner
Copy to CD or Device
Premium Services
Skin Chooser

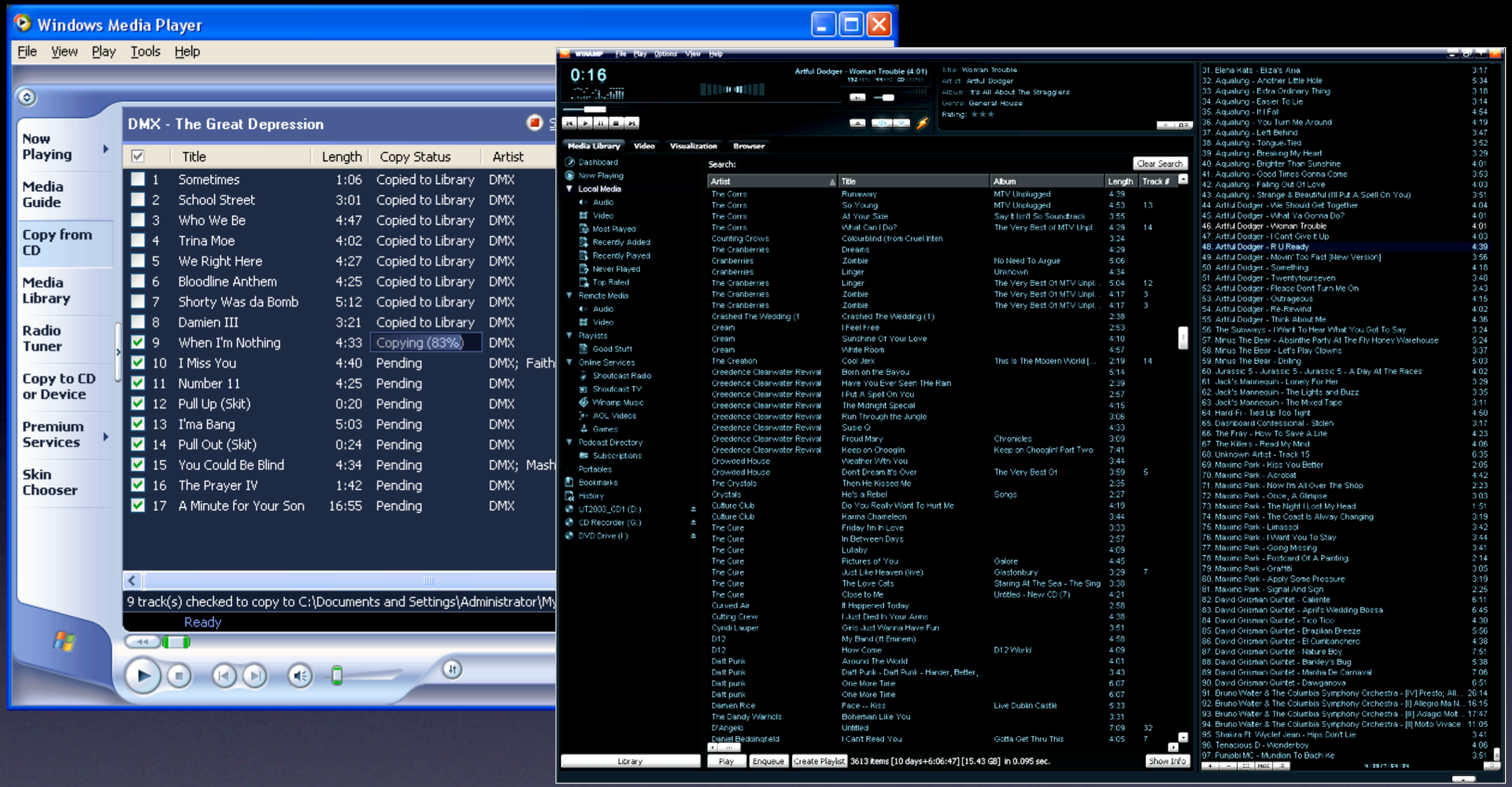
DMX - The Great Depression

Stop Copy | Find Album Info | View Album Info

	Title	Length	Copy Status	Artist	Composer	Genre
☐	1 Sometimes	1:06	Copied to Library	DMX	Earl "DMX" Simmons	Rap &
☐	2 School Street	3:01	Copied to Library	DMX	D. Blackman; E. Simmons	Rap &
☐	3 Who We Be	4:47	Copied to Library	DMX	E. Simmons; M. Davis	Rap &
☐	4 Trina Moe	4:02	Copied to Library	DMX	D. Blackman; E. Simmons	Rap &
☐	5 We Right Here	4:27	Copied to Library	DMX	E. Simmons; M. Davis	Rap &
☐	6 Bloodline Anthem	4:25	Copied to Library	DMX	B. Collins; E. Simmons	Rap &
☐	7 Shorty Was da Bomb	5:12	Copied to Library	DMX	D. Blackman; E. Simmons	Rap &
☐	8 Damien III	3:21	Copied to Library	DMX	A. Fields; E. Simmons	Rap &
☑	9 When I'm Nothing	4:33	Copying (83%)	DMX	D. Blackman; E. Simmons; J. Mtume;...	Rap &
☑	10 I Miss You	4:40	Pending	DMX; Faith Evans	B. Collins; E. Simmons	Rap &
☑	11 Number 11	4:25	Pending	DMX	A. Fields; E. Simmons	Rap &
☑	12 Pull Up (Skit)	0:20	Pending	DMX	P. Hurtt; T.D. Bell	Rap &
☑	13 I'ma Bang	5:03	Pending	DMX	E. Simmons; J Smith	Rap &
☑	14 Pull Out (Skit)	0:24	Pending	DMX	P. Hurtt; T.D. Bell	Rap &
☑	15 You Could Be Blind	4:34	Pending	DMX; Mashonda	E. Simmons; K Dean	Rap &
☑	16 The Prayer IV	1:42	Pending	DMX	E. Simmons	Rap &
☑	17 A Minute for Your Son	16:55	Pending	DMX	E. Simmons; K. Dean	Rap &

9 track(s) checked to copy to C:\Documents and Settings\Administrator\My Documents\My Music\WMA

Ready


Windows Media Player
File View Play Tools Help
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Media Guide
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Skin Chooser
DMX - The Great Depression
Title Length Copy Status Artist
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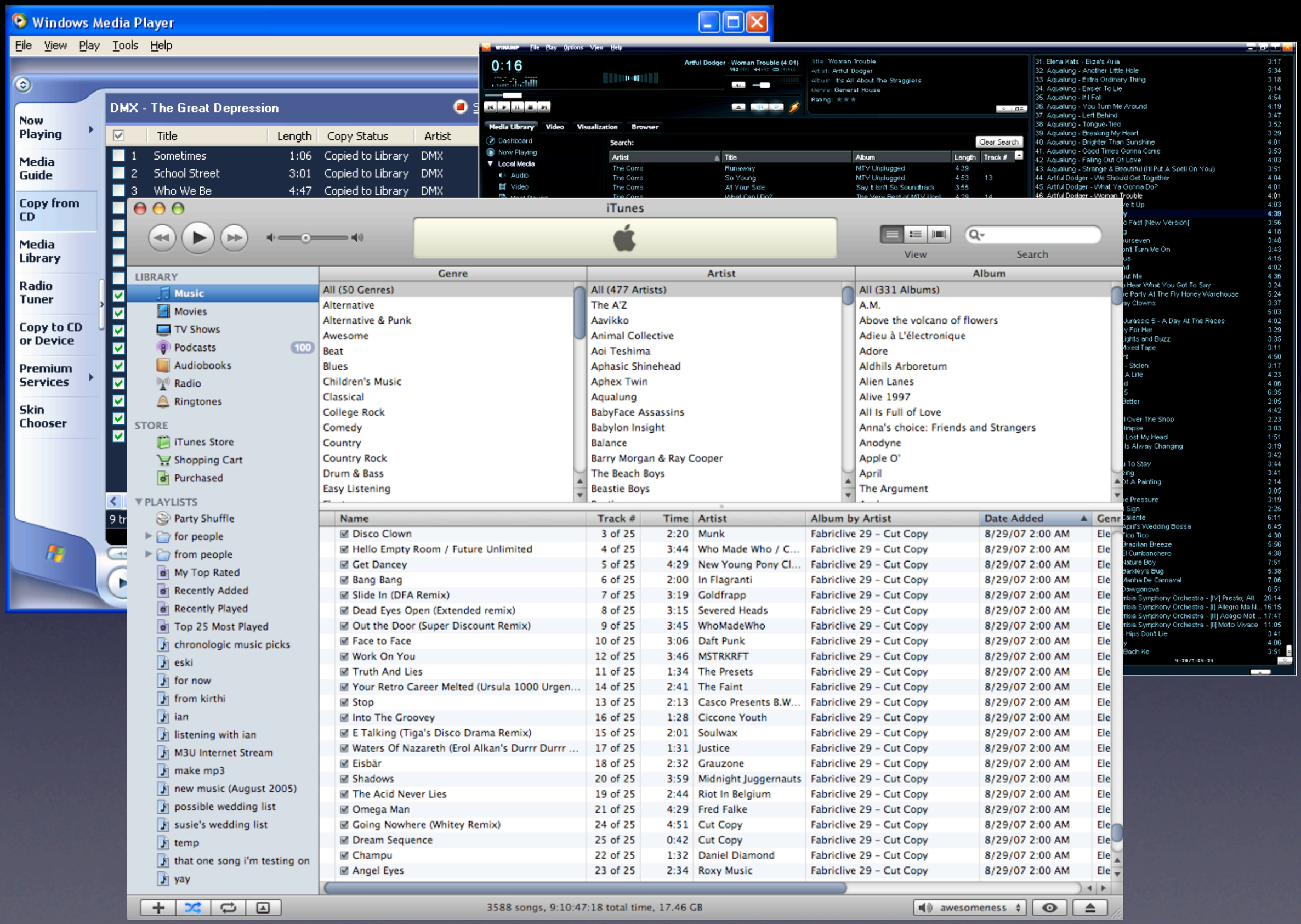
2 School Street 3:01 Copied to Library DMX
3 Who We Be 4:47 Copied to Library DMX
4 Trina Moe 4:02 Copied to Library DMX
5 We Right Here 4:27 Copied to Library DMX
6 Bloodline Anthem 4:25 Copied to Library DMX
7 Shorty Was da Bomb 5:12 Copied to Library DMX
8 Damien III 3:21 Copied to Library DMX
9 When I'm Nothing 4:33 Copying (83%) DMX
10 I Miss You 4:40 Pending DMX; Faith
11 Number 11 4:25 Pending DMX
12 Pull Up (Skit) 0:20 Pending DMX
13 I'ma Bang 5:03 Pending DMX
14 Pull Out (Skit) 0:24 Pending DMX
15 You Could Be Blind 4:34 Pending DMX; Mash
16 The Prayer IV 1:42 Pending DMX
17 A Minute for Your Son 16:55 Pending DMX
9 track(s) checked to copy to C:\Documents and Settings\Administrator\My
Ready
0:16
Artful Dodger - Woman Trouble (4:01)
Media Library
Video
Visualization
Browser
Search:
Clear Search
Artist
Title
Album
Length
Track #
Library
Play
Enqueue
Create Playlist
3613 items [10 days+6:06:47] [15.43 GB] in 0.095 sec.
Show Info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Copy from CD
Media Library
Radio Tuner
Copy to CD or Device
Premium Services
Skin Chooser
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1 Sometimes 1:06 Copied to Library DMX
2 School Street 3:01 Copied to Library DMX
3 Who We Be 4:47 Copied to Library DMX
0:16
Artful Dodger - Woman Trouble (4:01)
Media Library Video Visualization Browser
Dashboard
Now Playing
Local Media
Audio
Video
Search:
Clear Search
Artist Title Album Length Track #
The Corrs Runaway MTV Unplugged 4:39
The Corrs So Young MTV Unplugged 4:53 13
The Corrs At Your Side Say It Isn't So Soundtrack 3:55
31. Elena Kats - Eliza's Aria 3:17
32. Aqualung - Another Little Hole 5:34
33. Aqualung - Extra Ordinary Thing 3:18
34. Aqualung - Easier To Lie 3:14
35. Aqualung - If I Fell 4:54
36. Aqualung - You Turn Me Around 4:19
37. Aqualung - Left Behind 3:47
38. Aqualung - Tongue-Tied 3:52
39. Aqualung - Breaking My Heart 3:29
40. Aqualung - Brighter Than Sunshine 4:01
41. Aqualung - Good Times Gonna Come 3:53
42. Aqualung - Falling Out Of Love 4:03
43. Aqualung - Strange & Beautiful (Ill Put A Spell On You) 3:51
44. Artful Dodger - We Should Get Together 4:04
45. Artful Dodger - What Ya Gonna Do? 4:01
46. Artful Dodger - Woman Trouble 4:01
iTunes
View
Search
LIBRARY
Music
Movies
TV Shows
Podcasts 100
Audiobooks
Radio
Ringtones
STORE
iTunes Store
Shopping Cart
Purchased
PLAYLISTS
Party Shuffle
for people
from people
My Top Rated
Recently Added
Recently Played
Top 25 Most Played
chronologic music picks
eski
for now
from kirthi
ian
listening with ian
M3U Internet Stream
make mp3
new music (August 2005)
possible wedding list
susie's wedding list
temp
that one song i'm testing on
yay
Genre
All (50 Genres)
Alternative
Alternative & Punk
Awesome
Beat
Blues
Children's Music
Classical
College Rock
Comedy
Country
Country Rock
Drum & Bass
Easy Listening
Artist
All (477 Artists)
The A'Z
Aavikko
Animal Collective
Aoi Teshima
Aphasic Shinehead
Aphex Twin
Aqualung
BabyFace Assassins
Babylon Insight
Balance
Barry Morgan & Ray Cooper
The Beach Boys
Beastie Boys
Album
All (331 Albums)
A.M.
Above the volcano of flowers
Adieu à L'électronique
Adore
Aldhils Arboretum
Alien Lanes
Alive 1997
All Is Full of Love
Anna's choice: Friends and Strangers
Anodyne
Apple O'
April
The Argument
Name Track # Time Artist Album by Artist Date Added Genr
Disco Clown 3 of 25 2:20 Munk Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Hello Empty Room / Future Unlimited 4 of 25 3:44 Who Made Who / C... Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Get Dancey 5 of 25 4:29 New Young Pony Cl... Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Bang Bang 6 of 25 2:00 In Flagranti Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Slide In (DFA Remix) 7 of 25 3:19 Goldfrapp Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Dead Eyes Open (Extended remix) 8 of 25 3:15 Severed Heads Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Out the Door (Super Discount Remix) 9 of 25 3:45 WhoMadeWho Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Face to Face 10 of 25 3:06 Daft Punk Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Work On You 12 of 25 3:46 MSTRKRFT Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Truth And Lies 11 of 25 1:34 The Presets Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Your Retro Career Melted (Ursula 1000 Urgen... 14 of 25 2:41 The Faint Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Stop 13 of 25 2:13 Casco Presents B.W... Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Into The Groovey 16 of 25 1:28 Ciccone Youth Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
E Talking (Tiga's Disco Drama Remix) 15 of 25 2:01 Soulwax Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Waters Of Nazareth (Erol Alkan's Durrr Durrr ... 17 of 25 1:31 Justice Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Eisbär 18 of 25 2:32 Grauzone Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Shadows 20 of 25 3:59 Midnight Juggernauts Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
The Acid Never Lies 19 of 25 2:44 Riot In Belgium Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Omega Man 21 of 25 4:29 Fred Falke Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Going Nowhere (Whitey Remix) 24 of 25 4:51 Cut Copy Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Dream Sequence 25 of 25 0:42 Cut Copy Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Champu 22 of 25 1:32 Daniel Diamond Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
Angel Eyes 23 of 25 2:34 Roxy Music Fabriclive 29 - Cut Copy 8/29/07 2:00 AM Ele
3588 songs, 9:10:47:18 total time, 17.46 GB
awesomeness

These things are difficult:

- What sounds similar to this song?
- What music do you want to listen to?
- How can you find *new* music, and why might you like it?
- What are your listening *patterns*?

Browser wishlist

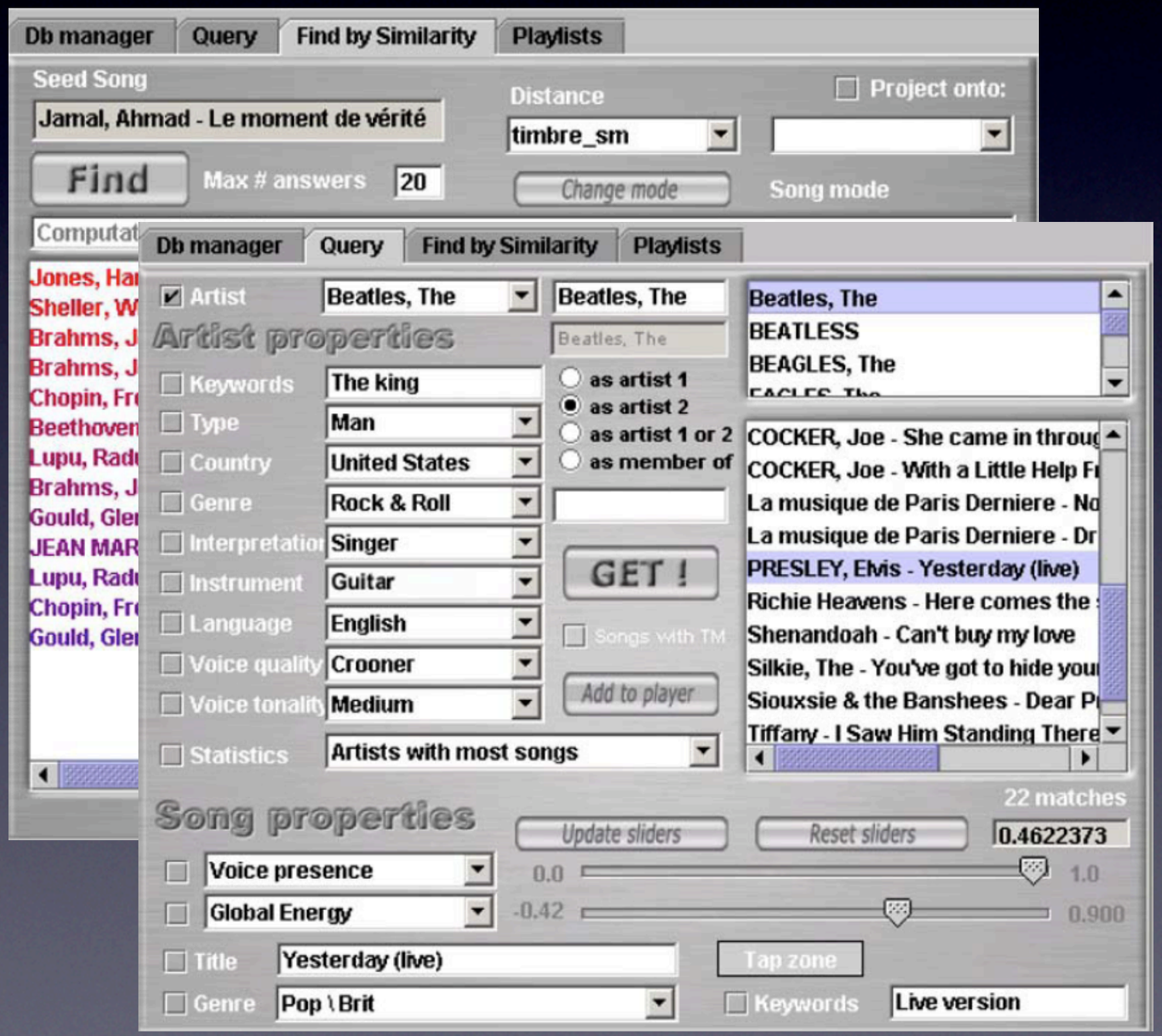
- organize music based on sound content
- organize music based on contextual data
- flexible exploration
- better filters
- better understand your music tastes and listening patterns

Other research projects

The “Music Browser”

European IST: CUIDADO Project

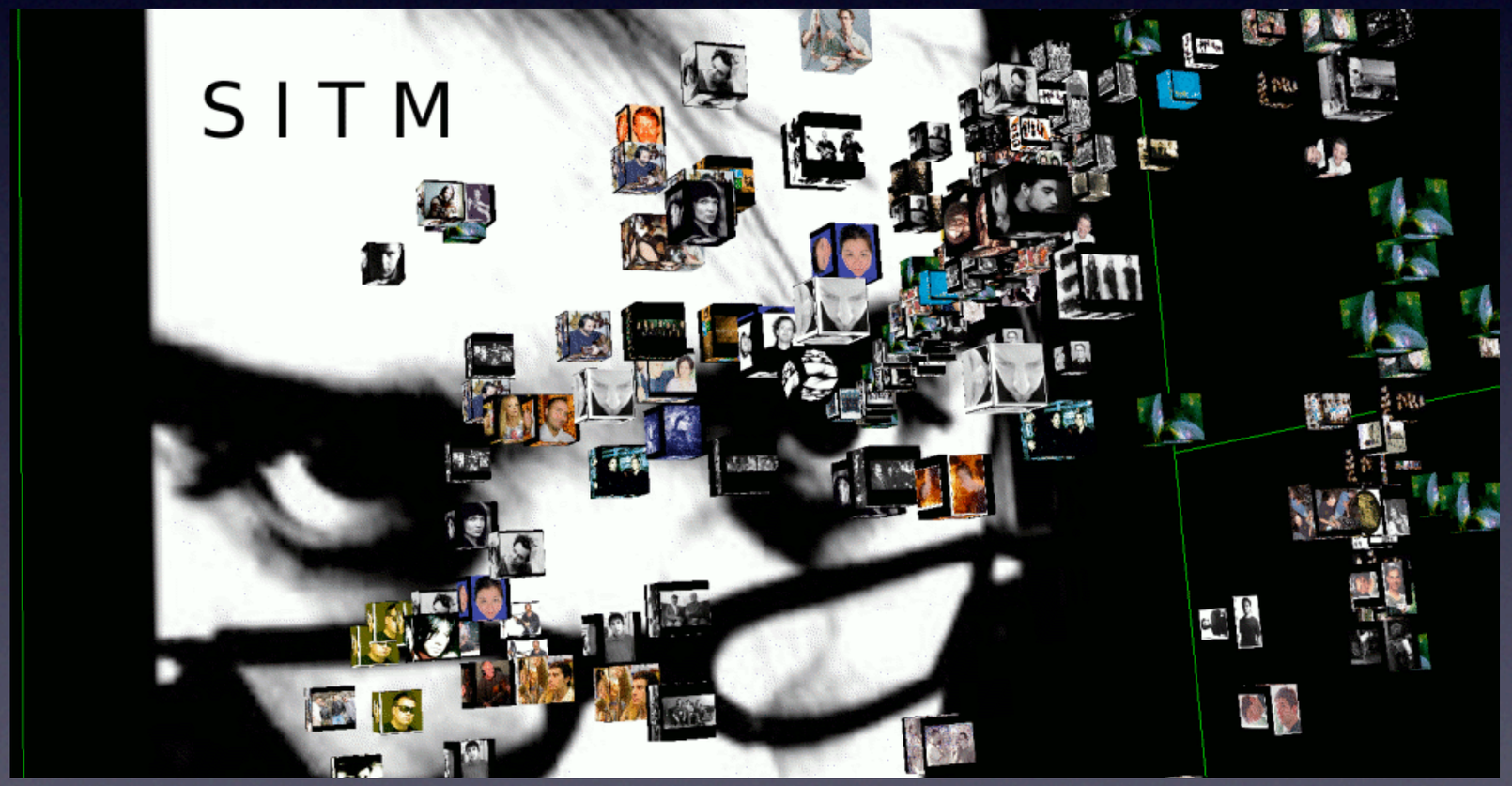
- acoustic and editorial data
- text-based interface
- Goal: “...allowing users to choose between many modes of music access: explorative, precise, focused or hazardous”



Search Inside The Music

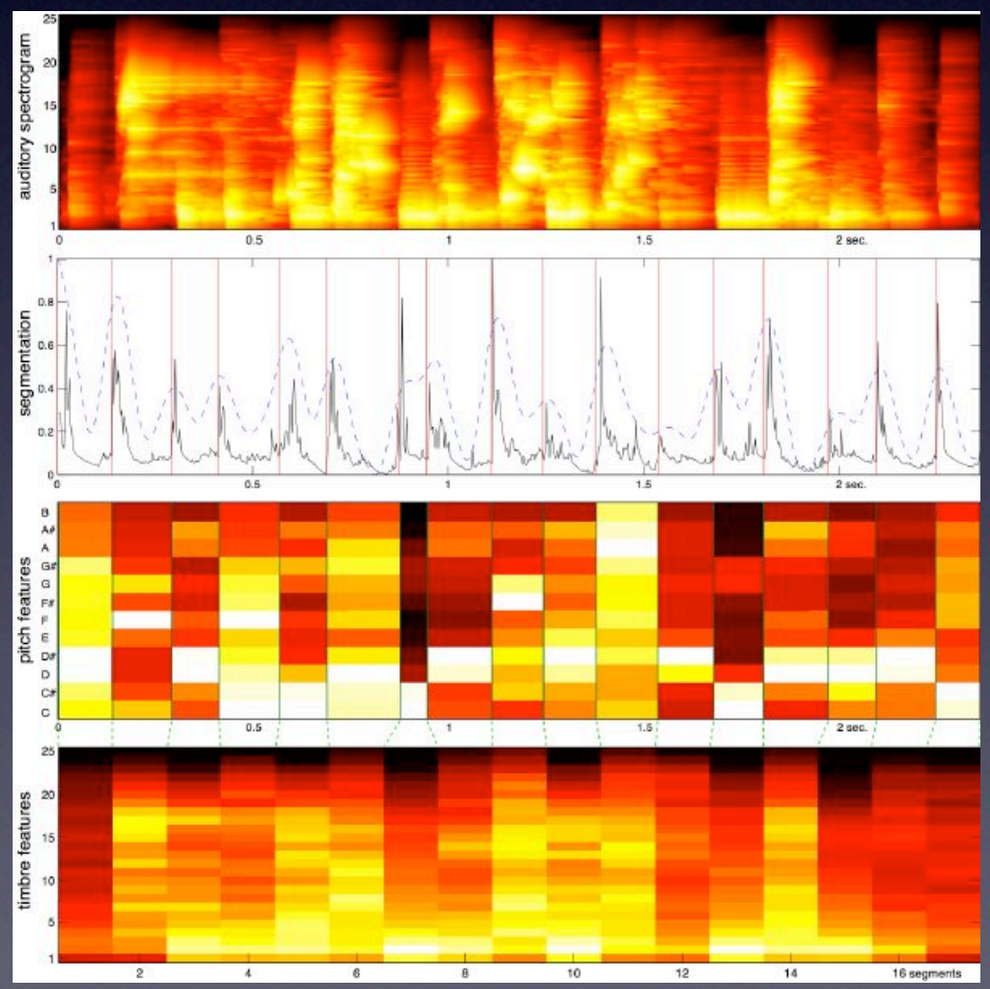
Sun Labs

- 3D
- audio data only
- limited interactivity



Proposed work:
Build a new music browser

Audio



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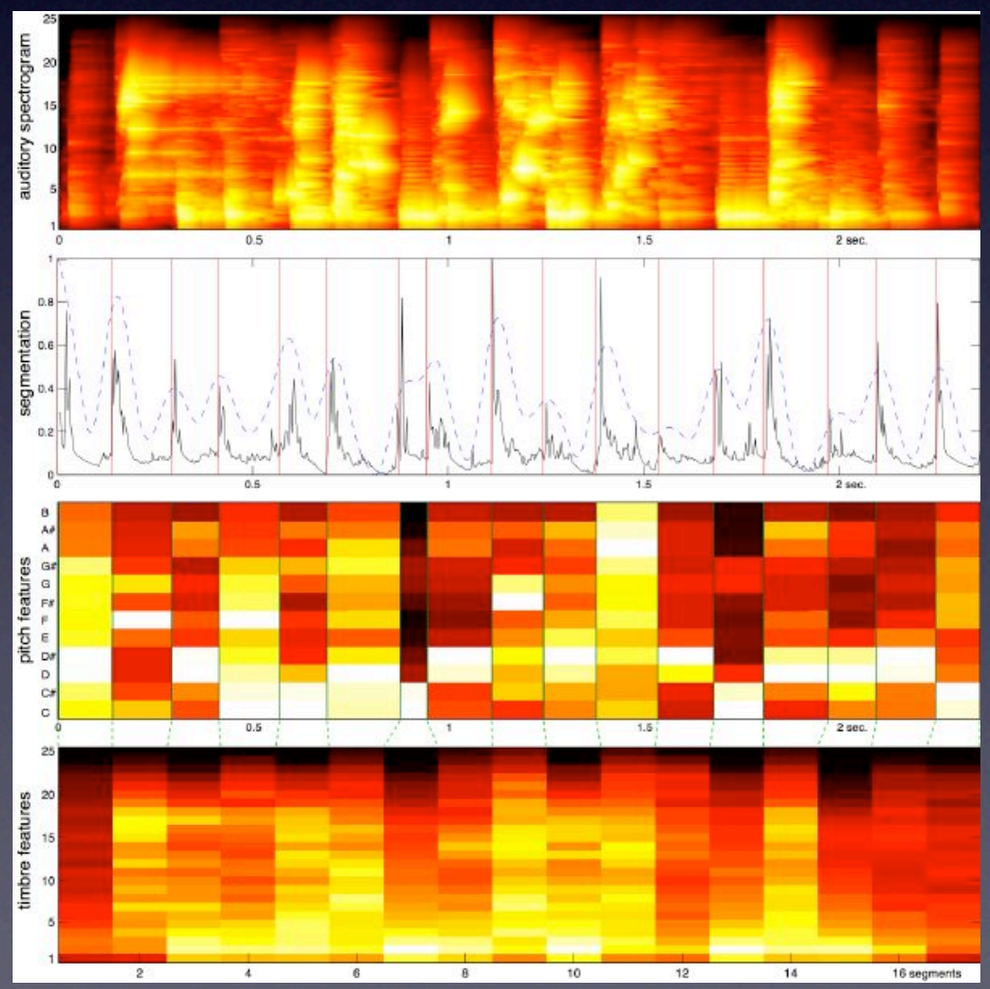
Audio



+

Contextual

alt-country americana blues classic rock
country folk rock singer-songwriter

"twangy guitars"

"This is SO romantic."

Analysis techniques

- Multidimensional scaling:

  similarity measures

- Principal components analysis:

  quantitative measures of features

→ locations in space

Analysis techniques

- Multidimensional scaling:

  similarity measures

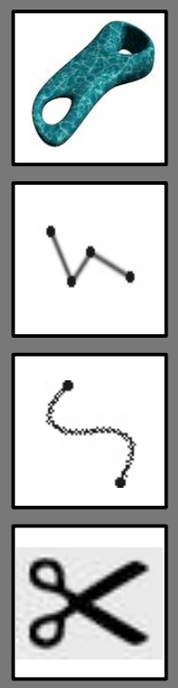
- Principal components analysis:

  quantitative measures of features

→ locations in space... **3D**

The new browser:

MusicBox



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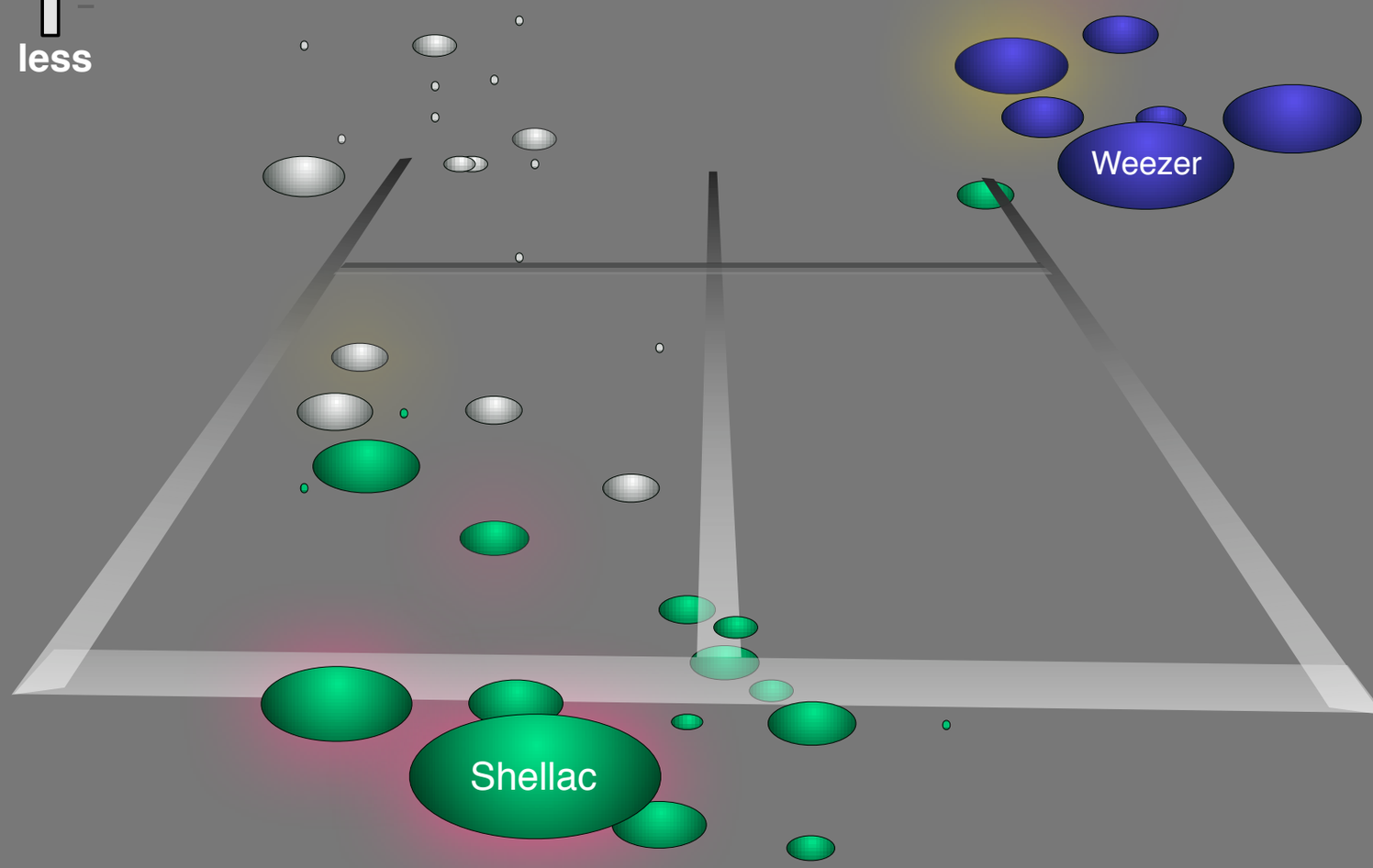


FEEDS

- last.fm friends
- hypemachine
- ✚

INPUT DATA

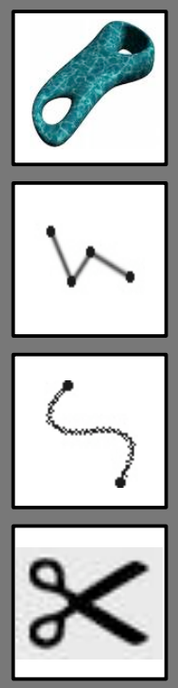
- ☑ **audio:**
  - MFCCs
  - pitch
  - loudness
  - timbre
- ☐ **contextual:**
  - last.fm
  - allmusic.com
  - youtube
  - wikipedia
  - musicbrainz
- ☑ **mine:**
  - memory date
  - last listened
  - ✚

>> alt_

search in: ☑ **tags** ☑ **names**

Groupings	Artist	Album	Song
All	Aavikko	Feels	Who Could Win A Ra
My Playlist 1	Animal Collective	Strawberry Jam	Leaf House
My Playlist 2	Aoi Teshima	Sung Tongs	Winters Love
My Playlist 3	Aphasic Shinehead		The Softest Voice
	Aphex Twin		Kids on Holiday

Music Box



more

less

selection tools

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Weezer

Shellac

>> alt_

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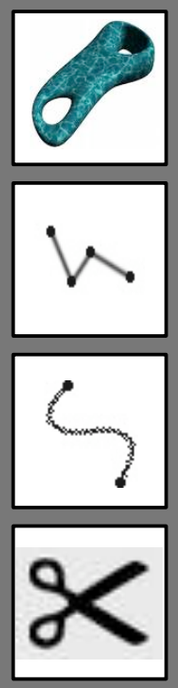
Music Box



more

less

live updates

FEEDS

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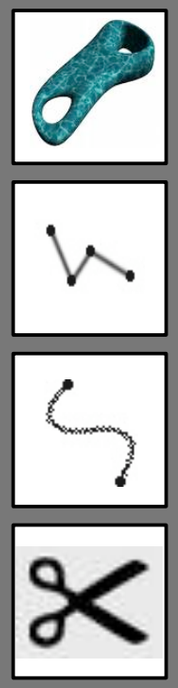

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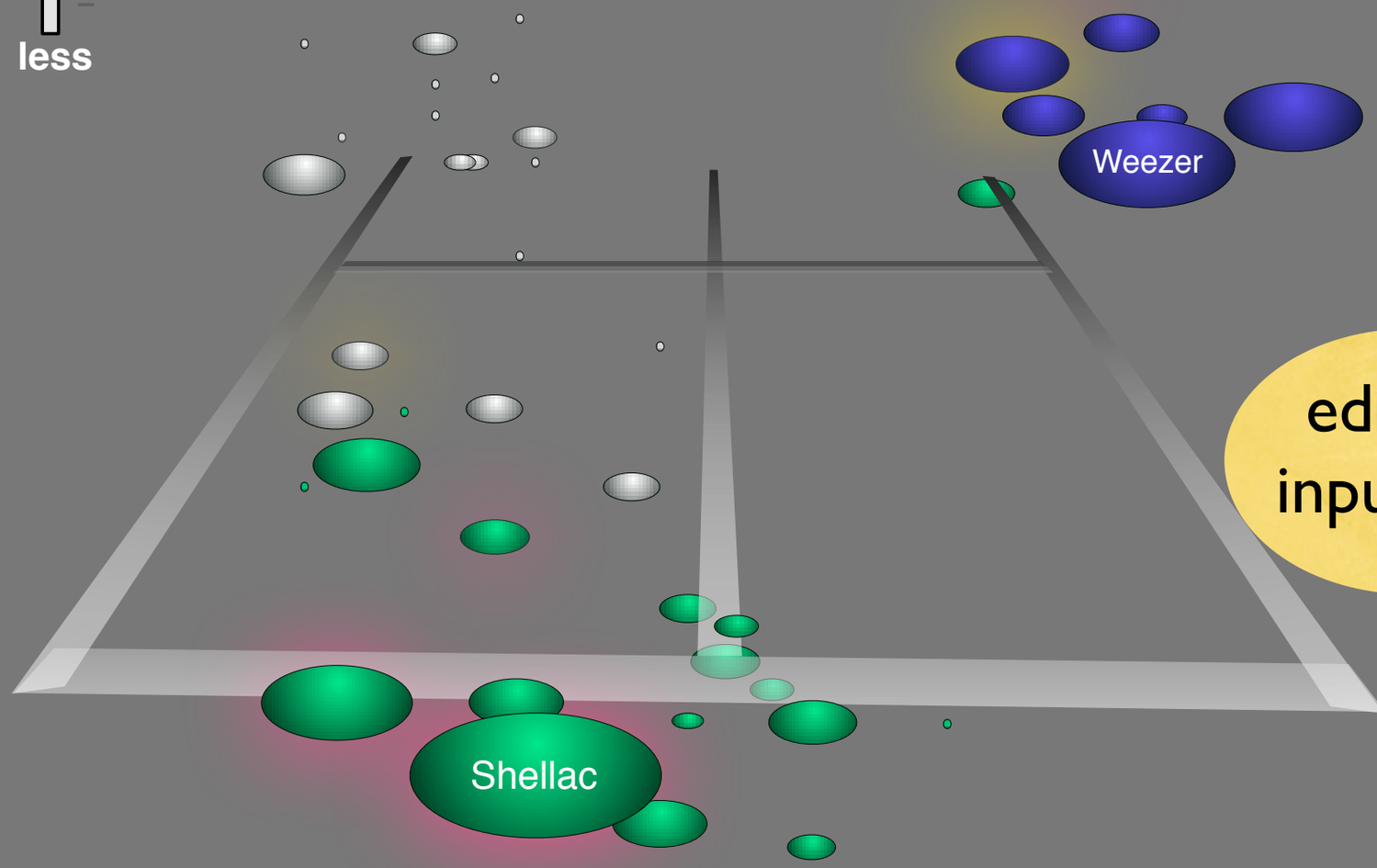

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editable input data

>> alt_

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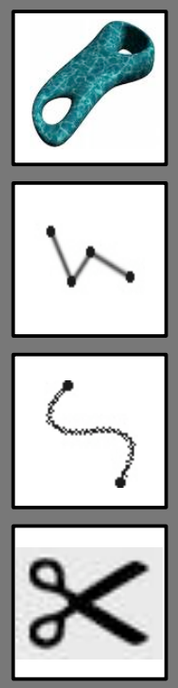

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- ✚

Weezer

Shellac

familiar
text interface

>> alt_

☑ **names**

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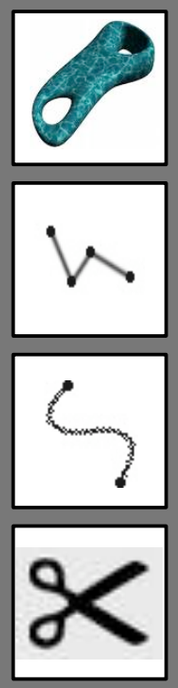
Music Box



more

less

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  - pitch
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Weezer

Shellac

more powerful search

>> alt_

search in: ☑ tags ☑ names

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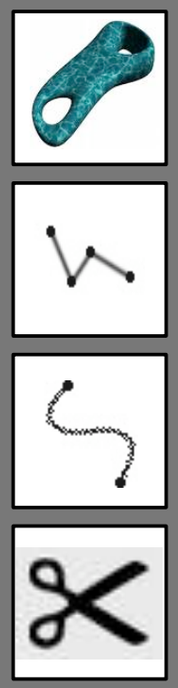

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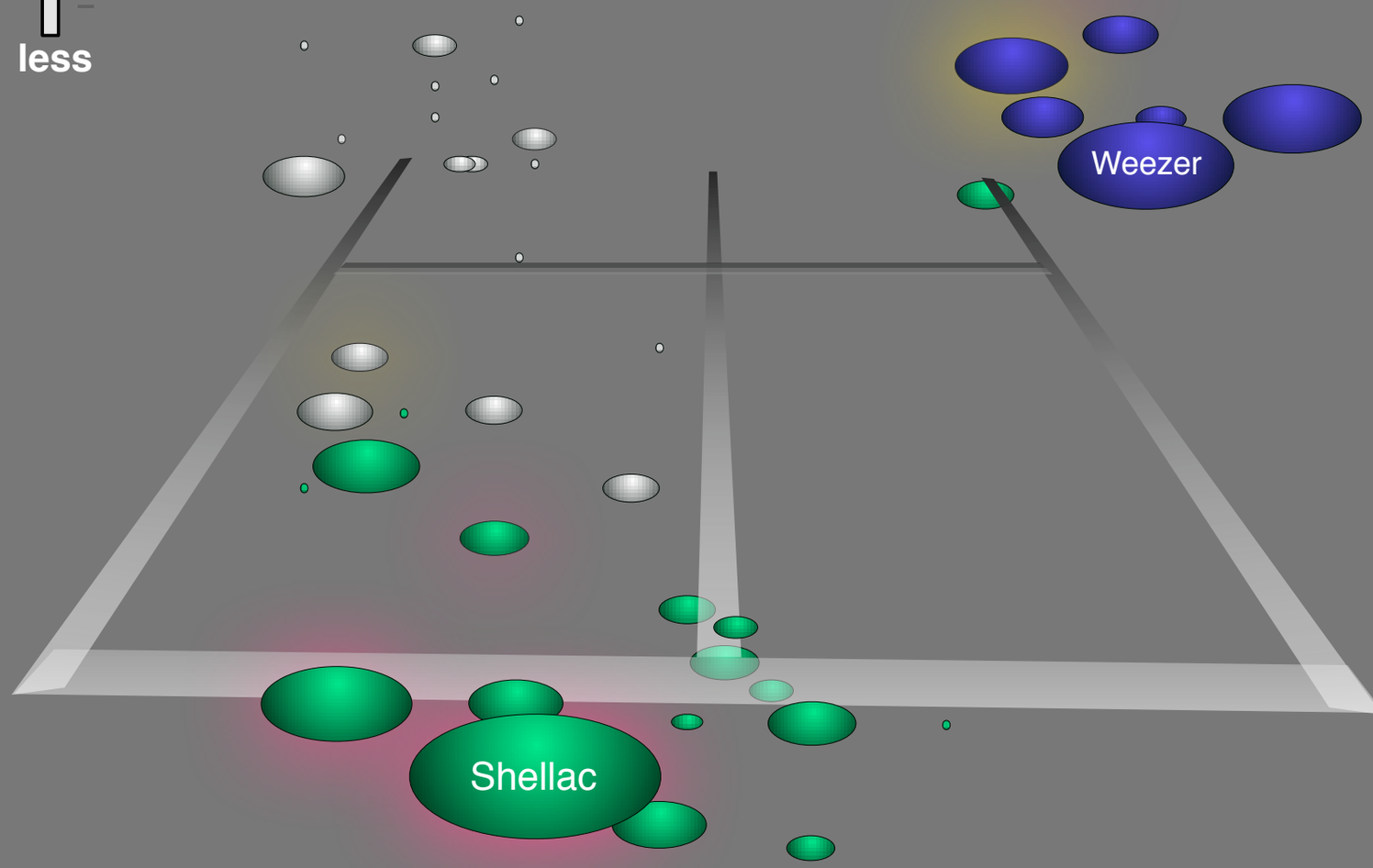

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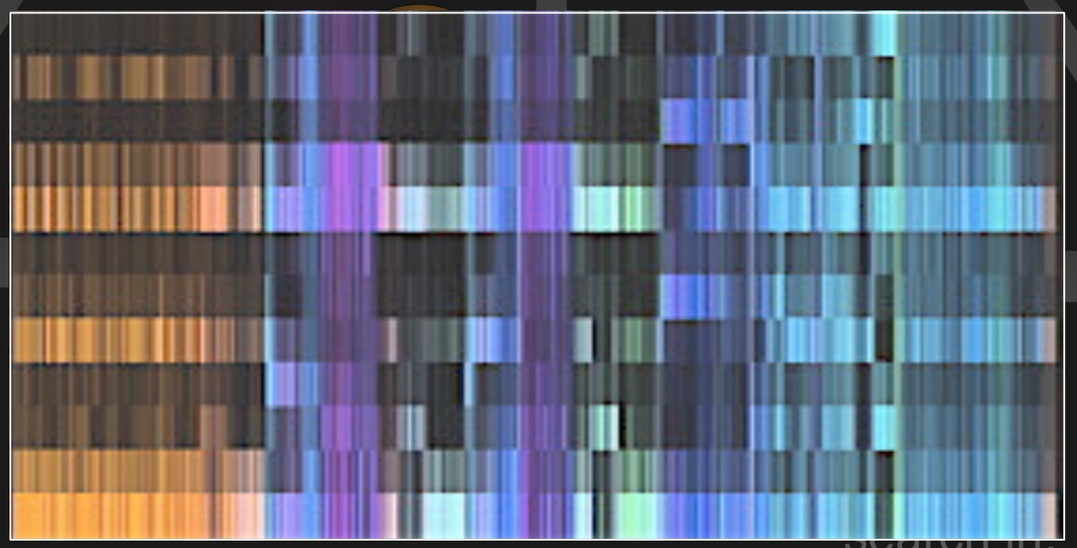
Music Box

more

The White Stripes
White Blood Cells [Track 2]

Hotel Yorba



3:23

FEEDS
- last.fm friends
- hypemachine
- +

INPUT DATA
- audio:
  - MFCCs
  - pitch
  - loudness
  - timbre
- contextual:
  - last.fm
  - allmusic.com
  - youtube
  - wikipedia
  - musicbrainz
- mine:
  - memory date
  - last listened
  - +

- metadata
  - Num plays: 16
  - Date added: 10/12/2007
  - Sample rate: 44.1 kHz
  - .
  - .
  - .
- + my tags
- online tags

alternative
blues
alternative rock
indie
rock

>> alt_

search in: tags names

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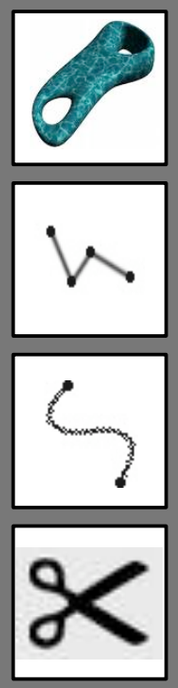
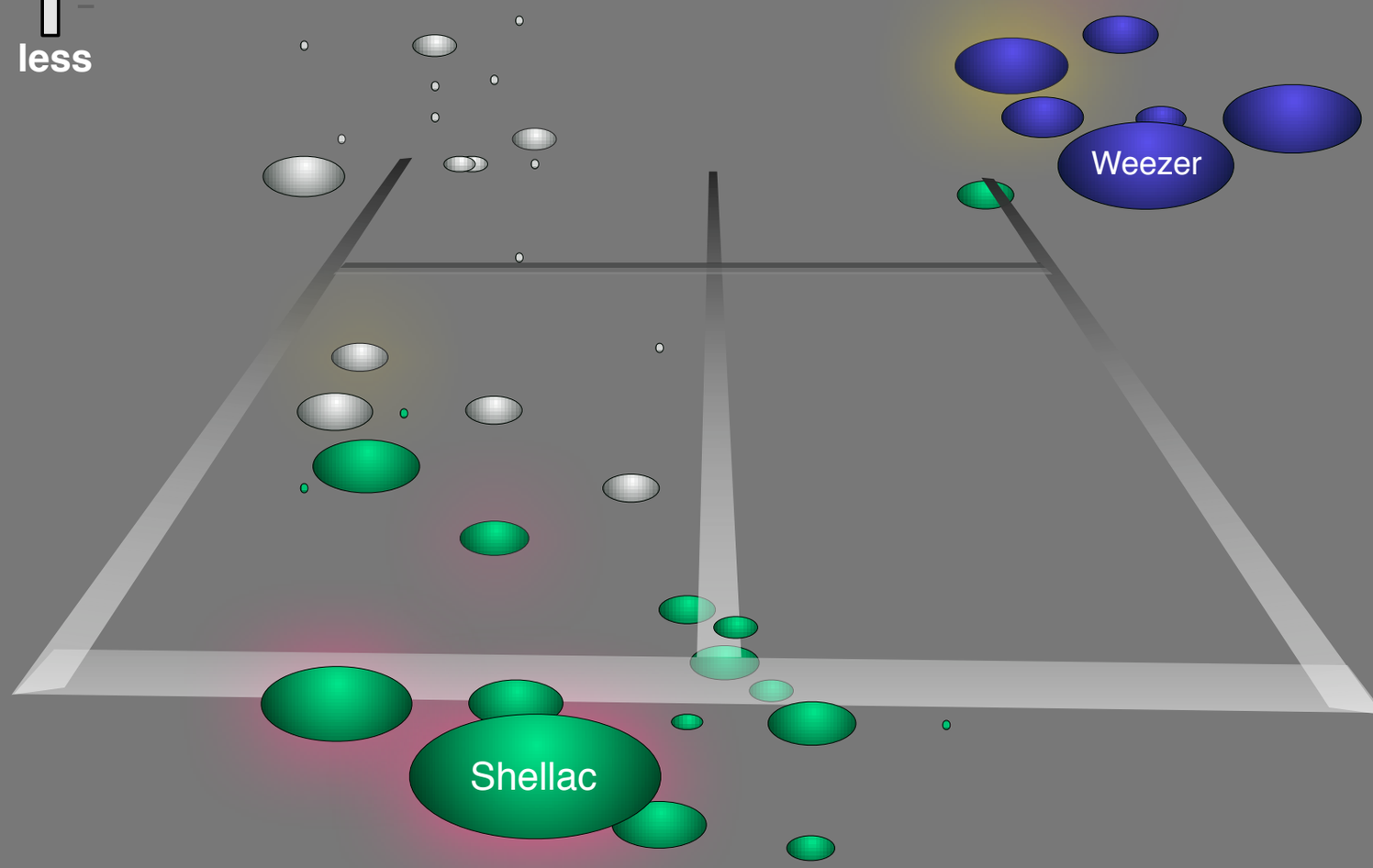


more

less



FEEDS

- last.fm friends
- hypemachine
- ✚

INPUT DATA

- ☑ **audio:**
  - MFCCs
  - pitch
  - loudness
  - timbre
- ☐ **contextual:**
  - last.fm
  - allmusic.com
  - youtube
  - wikipedia
  - musicbrainz
- ☑ **mine:**
  - memory date
  - last listened
  - ✚

>> alt_

search in: ☑ **tags** ☑ **names**

Groupings	Artist	Album	Song
All	Aavikko	Feels	Who Could Win A Ra
My Playlist 1	Animal Collective	Strawberry Jam	Leaf House
My Playlist 2	Aoi Teshima	Sung Tongs	Winters Love
My Playlist 3	Aphasic Shinehead		The Softest Voice
	Aphex Twin		Kids on Holiday

Music Box

Contribution

- 3D
- hybrid browsing/recommendation
- all automatic
- the bigger picture: context, transparency
- explorative, focused, or precise modes

Impact

- How accurate are these genre descriptors? Sub-genres?
- How varied is the music I listen to?
- How has an artist's sound changed over time?
- How different are remixes/performances/ productions of the same piece?

Tools

- Echo Nest: Analyzer (and Contextual API)
- Sun Labs: content-based music similarity, SITM 3D, web crawlers, artist similarity
- last.fm
- private music database (~11,000 albums)

Evaluation: User studies

Time completion of "normal" and more specialized tasks:

- Find a piece you want to listen to now.
- Make a playlist for your party.
- Find the music you like to listen to in the mornings.

Survey for more subjective feedback