

Finding a path through the Juke Box The Playlist Tutorial

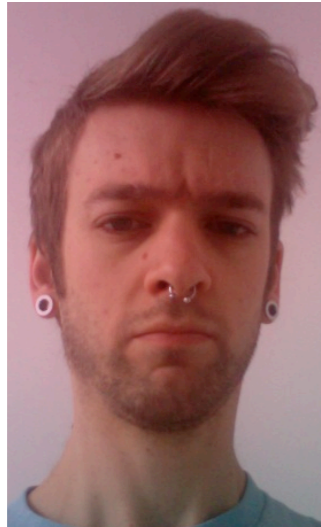
Ben Fields, Paul Lamere
ISMIR 2010



“I still maintain that music is the best way of getting the self-expression job done.”

Nick Hornby

Speakers



Ben Fields
Goldsmiths University of London
benfields.net



Paul Lamere
The Echo Nest
MusicMachinery.com

Goals

- Understand where and why playlists are important
- Understand current and past methods of playlist construction
- Understand the whys and hows of various evaluation methods

Introduction

What is a playlist?

- mixtape
- prerecorded DJ set/mix CD
- live DJ set (typically *mixed*)
- radioshow logs
- an album
- functional music (eg. Muzak)
- any ordered list of songs?

What is a playlist?

We define a playlist as a set of **songs** meant to be **listened** to as a group, usually with an explicit **order**

Why is playlisting important?

- Ultimately, music is consumed through listening
- An awareness of this act of listening is critical to successful MIR application
- The playlist is a formalization of this listening process
- Playlists have a traditional revenue model for artists and labels (e.g. radio)

Brief History of Playlists

Mixed Concert Programs

- Marks the beginnings international combinations of music from multiple composers
- Begins circa 1850 in London
- The idea of a set of music being curated begins to form

Early Broadcast Media

- Moving the ethos of the earlier period onto the radio
- Biggest changes are technology
 - Broadcast = larger simultaneous audience
 - Phonograph brings recorded music
- Initial broadcasts (eg. 1906 - Fessenden) as publicity stunts
- First continuous broadcast 1920 - Frank Conrad

Rock On the Radio

- Radio as a medium begins to push certain genres, especially rock and roll and r 'n' b
- Playlist first used to describe (unordered) sets of songs
- Personality driven
 - John Peel
 - Casey Kasem

Disco & Hip-Hop

emergence of the club DJ

- DJs at disco nightclubs, with a mixer and two turntables, saw the birth of the idea of **continuous mixing**
- DJs wanted dancers to not notice song transitions, and techniques such as **beat matching** and **phrase alignment** were pioneered
- Hip-Hop saw this idea pushed further, as DJs became live remixers, turning the turntable into an instrument
- At the same time, club DJs started to become the top billing over live acts, the curator becoming more of a draw than the artist

The Playlist Goes Personal

- The emergence of portable audio devices drives the popularity of cassette tapes
- This in turn leads to reordering and combining of disparate material into *mixtapes*
- Mixtapes themselves are traded and distributed socially, providing a means for recommendation and discovery
- In hip-hop, mixtapes served as the first recordings of new DJs featuring novel mixes and leading to current phenomenon of Mix [CD|set|tape] (now on CD or other digital media)

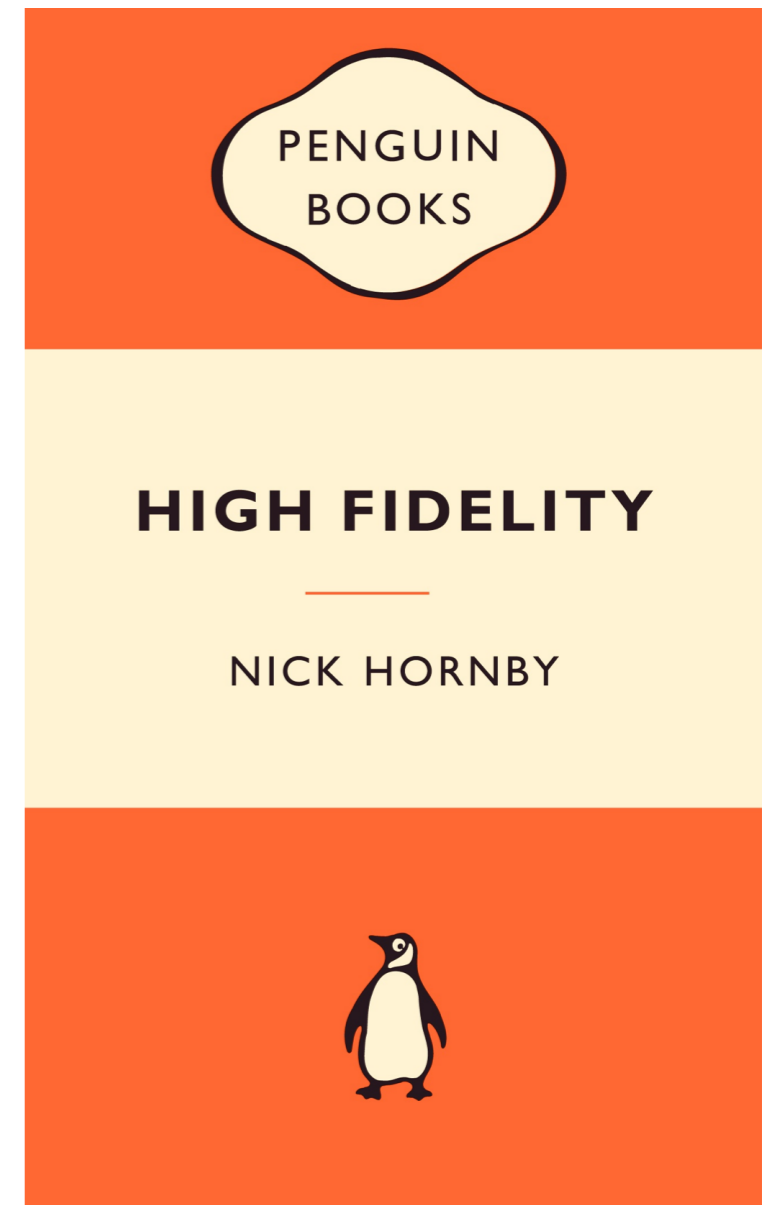
Now With Internet

- The Web's increase in popularity and MP3 audio compression allow for practical sharing of music of the Internet
- This brings the mixtape for physical sharing to non-place sharing.
- Streaming-over-internet radio emerges
- Playlists on the cloud: play.me, spotify, etc.

Aspects of a good playlist

Aspects of a good Playlist

*To me, making a tape is like writing a letter — there's a lot of erasing and rethinking and starting again. A good compilation tape, like breaking up, is hard to do. You've got to kick off with a corker, to hold the attention (...), and then you've got to up it a notch, or cool it a notch, and you can't have white music and black music together, unless the white music sounds like black music, and you can't have two tracks by the same artist side by side, unless you've done the whole thing in pairs and...oh, there are loads of rules. - Nick Hornby, *High Fidelity**



Factors affecting a good playlist

- The **songs** in the playlist
 - Listener's **preference** for the songs
 - Listener's **familiarity** with the songs
 - Song **coherence**
 - Artist / Song **variety**
 - And more: **freshness, coolness,**
- The **order** of the songs:
 - The song **transitions**
 - Overall playlist **structure**
 - **Serendipity**
- The **context**

Factors affecting a good playlist

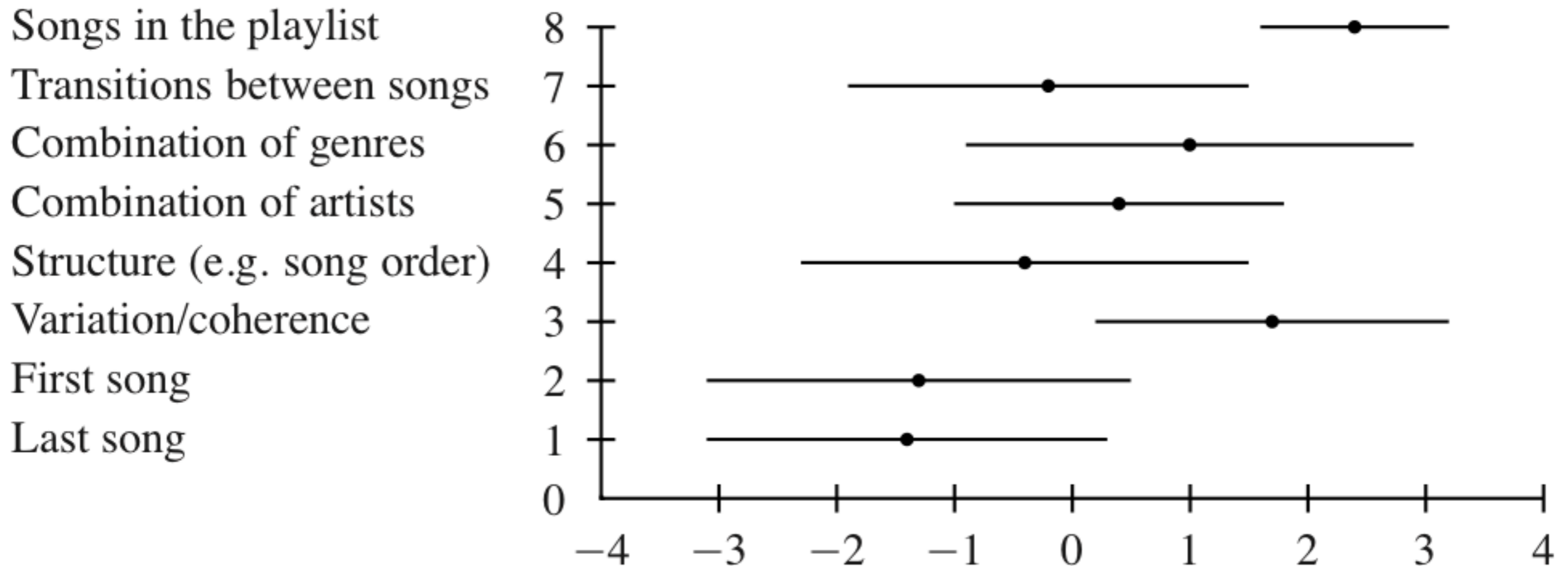


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

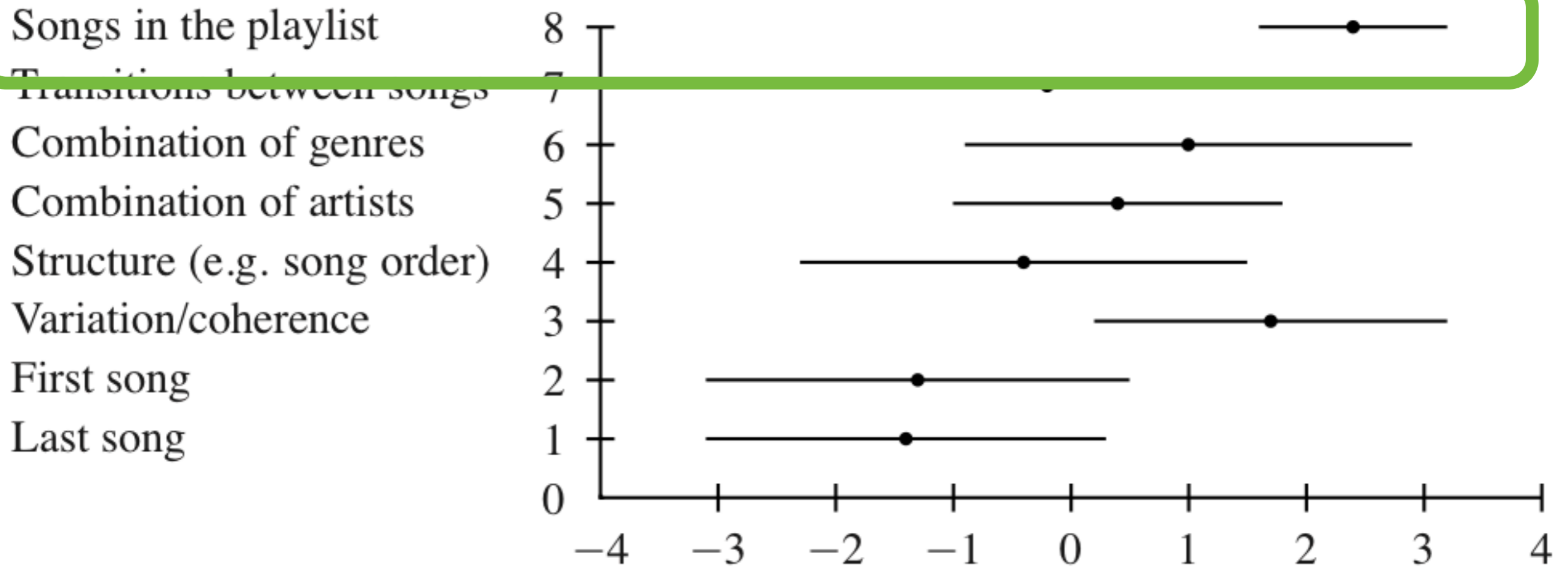


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

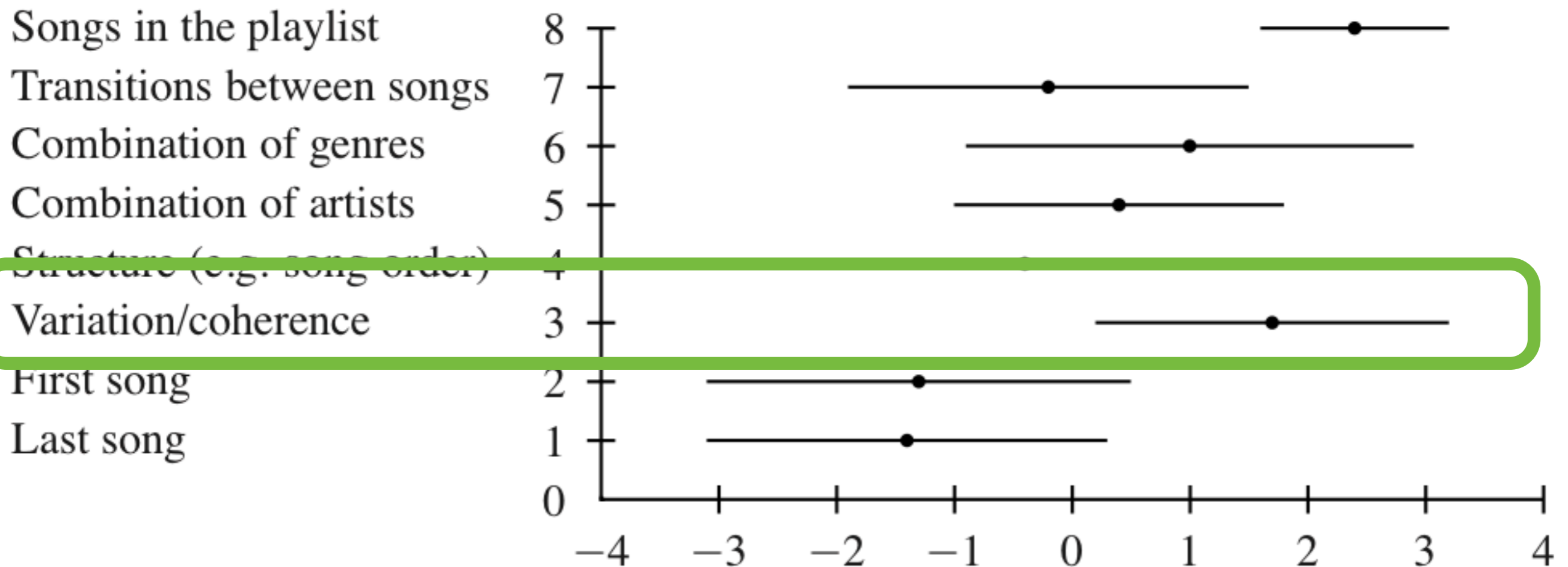


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

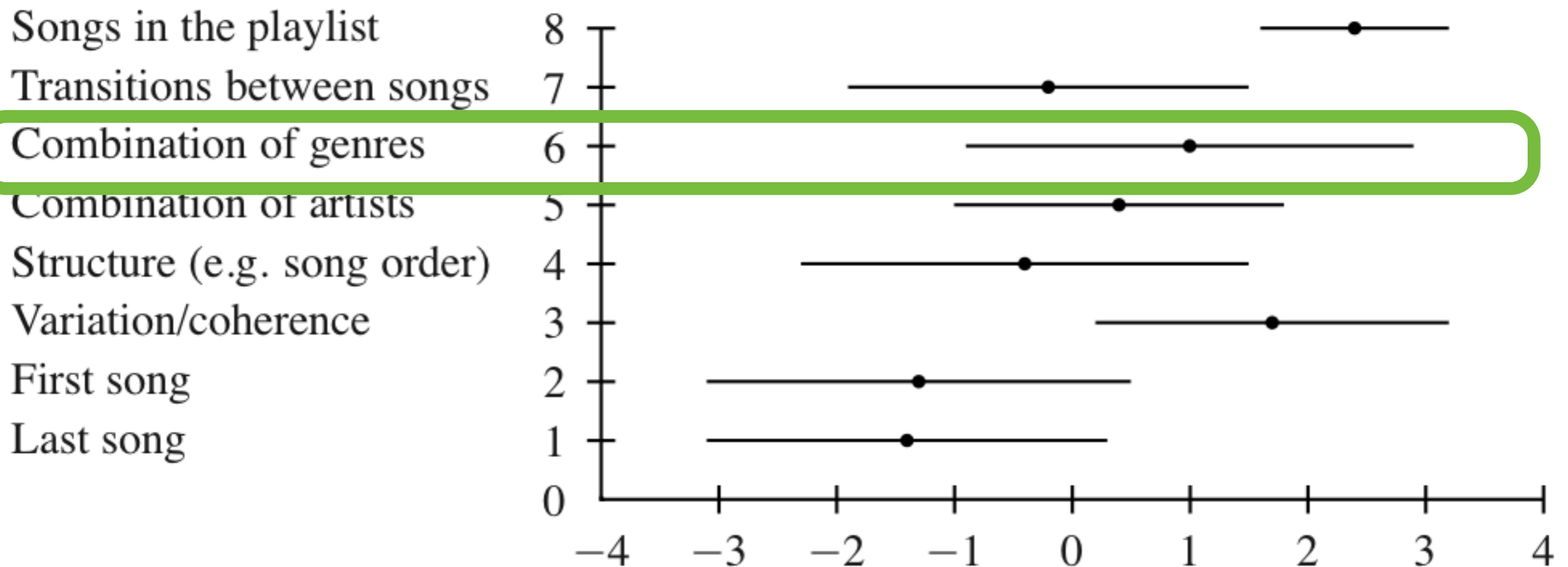


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

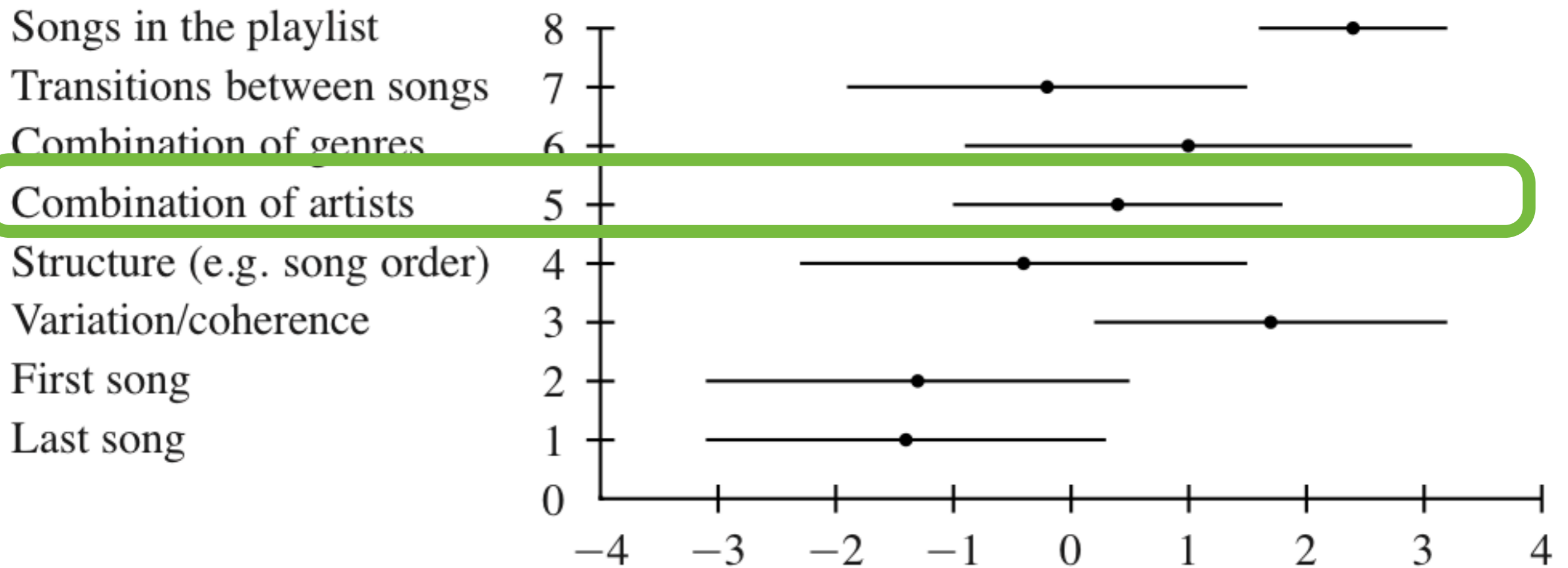


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

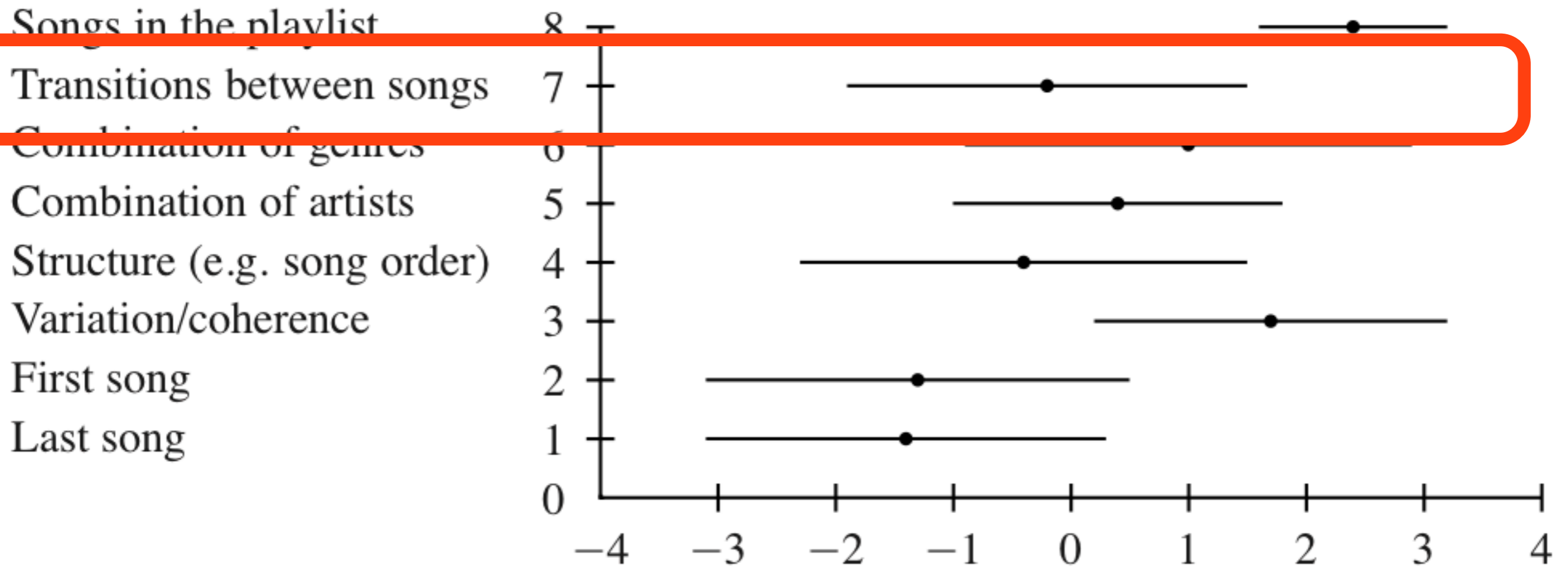


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

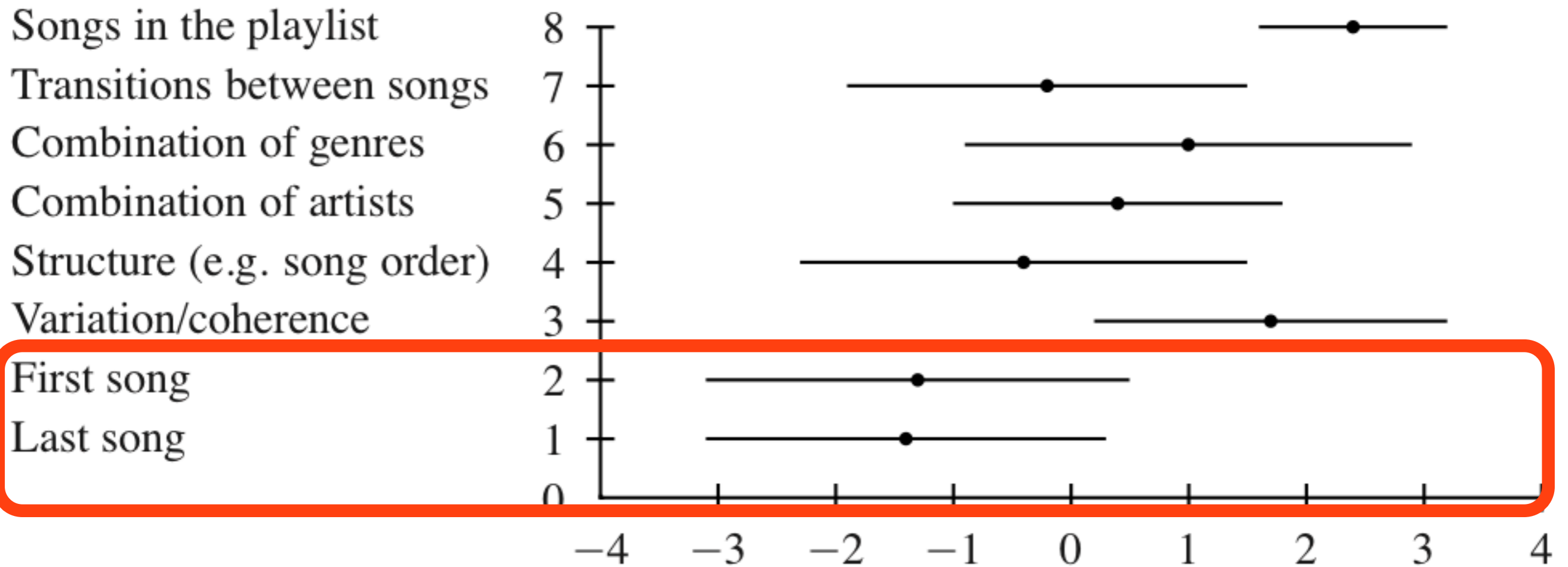


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting a good playlist

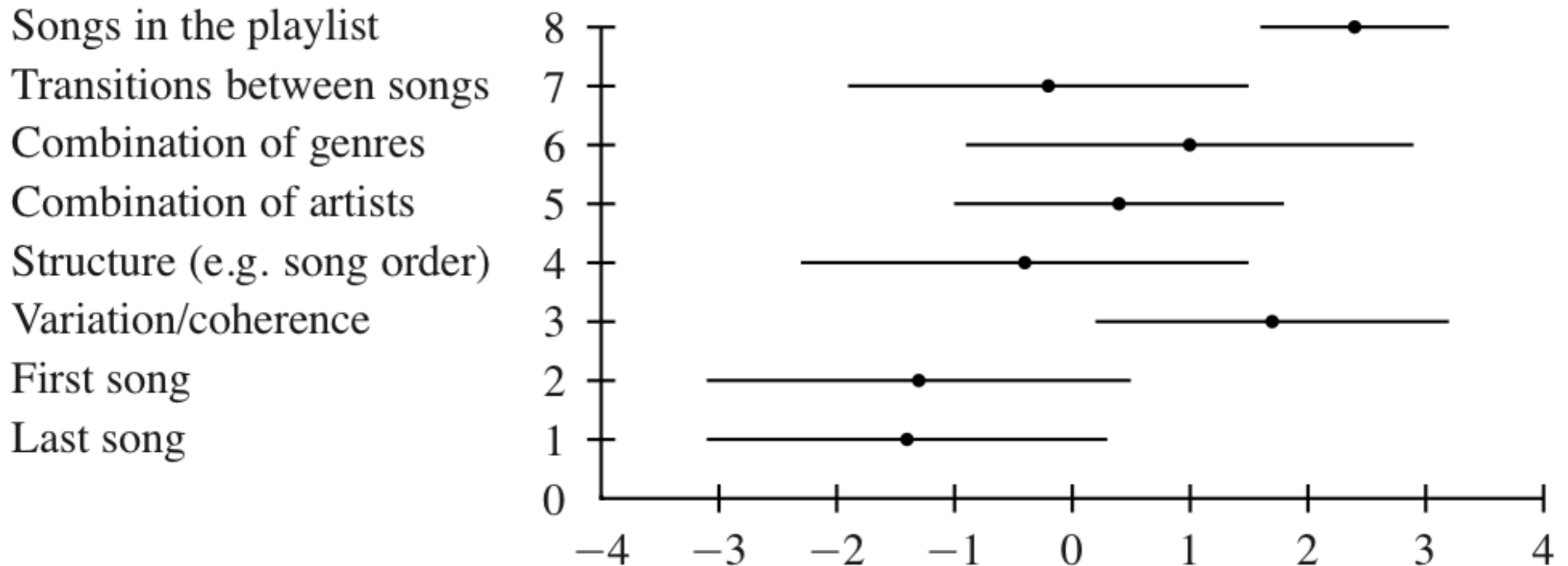


Figure 1: Importance of various factors in creating a playlist.

Survey with 14 participants

Factors affecting preference

- **Musical taste** - long term slowly evolving commitment to a genre
- Recent listening **history**
- **Mood** or state of mind
- The **context**:
listening, driving, studying,
working, exercising, etc.
- The **familiarity**
 - People sometimes prefer to listen to the familiar songs that they like less than non-familiar songs
 - Familiarity significantly predicts choice when controlling for the effects of liking, regret, and ‘coolness’

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style
- Song similarity
- Event or activity
- Romance
- Message or story
- Mood
- Challenge or puzzle
- Orchestration
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*,
- Song similarity
- Event or activity
- Romance
- Message or story
- Mood
- Challenge or puzzle
- Orchestration
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*
- Song similarity
- Event or activity *“anti-Valentine mix”*
- Romance
- Message or story
- Mood
- Challenge or puzzle
- Orchestration
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*
- Song similarity
- Event or activity *“anti-Valentine mix”*
- Romance
- Message or story *a mix with the title “‘quit being a douche’, ‘cause I’m in love with you.’”*
- Mood
- Challenge or puzzle
- Orchestration
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*
- Song similarity
- Event or activity *“anti-Valentine mix”*
- Romance
- Message or story *a mix with the title “‘quit being a douche’, ‘cause I’m in love with you.’”*
- Mood *song whose title is a question?*
- Challenge or puzzle
- Orchestration
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*
- Song similarity
- Event or activity *“anti-Valentine mix”*
- Romance
- Message or story *a mix with the title “‘quit being a douche’, ‘cause I’m in love with you.’”*
- Mood *song whose title is a question?*
- Challenge or puzzle
- Orchestration *songs where the singer hums for a little bit*
- Characteristic of the mix recipient
- Cultural references

Coherence

Organizing principals for mix help requests

- Artist / Genre / Style *“acoustic-country-folk type stuff”*
- Song similarity
- Event or activity *“anti-Valentine mix”*
- Romance
- Message or story *a mix with the title “‘quit being a douche’, ‘cause I’m in love with you.’”*
- Mood *song whose title is a question?*
- Challenge or puzzle
- Orchestration *songs where the singer hums for a little bit*
- Characteristic of the mix recipient
- Cultural references *“songs about superheroes”*

“People have gotten used to listening to songs in the order they want, and they'll want to continue to do so even if they can't get the individual songs from file-trading programs.”

Phil Leigh

Ordering Principals

- Bucket of similars, genre
- Acoustic attributes such as tempo, loudness, danceability
- Social attributes such popularity, 'hotness'
- Mood attributes ('sad' to 'happy')
- Theme / lyrics
- Alphabetical
- Chronological
- Random
- Song transitions
- Novelty orderings

| | |
|----|---|
| 1 | <input checked="" type="checkbox"/> All That I'm Living For |
| 2 | <input checked="" type="checkbox"/> Away |
| 3 | <input checked="" type="checkbox"/> Away |
| 4 | <input checked="" type="checkbox"/> Away (live) |
| 5 | <input checked="" type="checkbox"/> Believe |
| 6 | <input checked="" type="checkbox"/> Break My Fall |
| 7 | <input checked="" type="checkbox"/> Breakdown |
| 8 | <input checked="" type="checkbox"/> Breath |
| 9 | <input checked="" type="checkbox"/> Breathe No More [Live] |
| 10 | <input checked="" type="checkbox"/> Bring Me To Life |
| 11 | <input checked="" type="checkbox"/> Bring Me To Life (Live) |
| 12 | <input checked="" type="checkbox"/> Bring Me To Life [Live] |
| 13 | <input checked="" type="checkbox"/> Call Me When You're Sober |
| 14 | <input checked="" type="checkbox"/> Call Me When You're Sober |
| 15 | <input checked="" type="checkbox"/> Cloud Nine |
| 16 | <input checked="" type="checkbox"/> Cloud Nine |

Novelty ordering

- 0 We Wish You A Merry Christmas - Weezer
- 1 Stranger Things Have Happened - Foo Fighters
- 2 Dude We're Finally Landing - Rivers Cuomo
- 3 Gotta Be Somebody's Blues - Jimmy Eat World
- 4 Someday You Will Be Loved - Death Cab For Cutie
- 5 Dancing In The Moonlight - The Smashing Pumpkins
- 6 Take The Long Way Round - Teenage Fanclub
- 7 Don't Make Me Prove It - Veruca Salt
- 8 The Sacred And Profane - Smashing Pumpkins, The
- 9 Everything Is Alright - Motion City Soundtrack
- 10 Trains, brains & rain - The Flaming Lips
- 11 No One Needs To Know - Ozma
- 12 What Is Your Secret - Nada Surf
- 13 The Spark That Bled - Flaming Lips, The
- 14 Defending The Faith - Nerf Herder

Novelty ordering

- 0 We Wish You A Merry Christmas - Weezer
- 1 Stranger Things Have Happened - Foo Fighters
- 2 Dude We're Finally Landing - Rivers Cuomo
- 3 Gotta Be Somebody's Blues - Jimmy Eat World
- 4 Someday You Will Be Loved - Death Cab For Cutie
- 5 Dancing In The Moonlight - The Smashing Pumpkins
- 6 Take The Long Way Round - Teenage Fanclub
- 7 Don't Make Me Prove It - Veruca Salt
- 8 The Sacred And Profane - Smashing Pumpkins, The
- 9 Everything Is Alright - Motion City Soundtrack
- 10 Trains, brains & rain - The Flaming Lips
- 11 No One Needs To Know - Ozma
- 12 What Is Your Secret - Nada Surf
- 13 The Spark That Bled - Flaming Lips, The
- 14 Defending The Faith - Nerf Herder

Novelty ordering

- 0 We Wish You A Merry Christmas - Weezer
- 1 Stranger Things Have Happened - Foo Fighters
- 2 Dude We're Finally Landing - Rivers Cuomo
- 3 Gotta Be Somebody's Blues - Jimmy Eat World
- 4 Someday You Will Be Loved - Death Cab For Cutie
- 5 Dancing In The Moonlight - The Smashing Pumpkins
- 6 Take The Long Way Round - Teenage Fanclub
- 7 Don't Make Me Prove It - Veruca Salt
- 8 The Sacred And Profane - Smashing Pumpkins, The
- 9 Everything Is Alright - Motion City Soundtrack
- 10 Trains, brains & rain - The Flaming Lips
- 11 No One Needs To Know - Ozma
- 12 What Is Your Secret - Nada Surf
- 13 The Spark That Bled - Flaming Lips, The
- 14 Defending The Faith - Nerf Herder

Novelty ordering

- 0 We Wish You A Merry Christmas - Weezer
- 1 Stranger Things Have Happened - Foo Fighters
- 2 Dude We're Finally Landing - Rivers Cuomo
- 3 Gotta Be Somebody's Blues - Jimmy Eat World
- 4 Someday You Will Be Loved - Death Cab For Cutie
- 5 Dancing In The Moonlight - The Smashing Pumpkins
- 6 Take The Long Way Round - Teenage Fanclub
- 7 Don't Make Me Prove It - Veruca Salt
- 8 The Sacred And Profane - Smashing Pumpkins, The
- 9 Everything Is Alright - Motion City Soundtrack
- 10 Trains, brains & rain - The Flaming Lips
- 11 No One Needs To Know - Ozma
- 12 What Is Your Secret - Nada Surf
- 13 The Spark That Bled - Flaming Lips, The
- 14 Defending The Faith - Nerf Herder

Novelty ordering

- 0 We Wish You A Merry Christmas - Weezer
- 1 Stranger Things Have Happened - Foo Fighters
- 2 Dude We're Finally Landing - Rivers Cuomo
- 3 Gotta Be Somebody's Blues - Jimmy Eat World
- 4 Someday You Will Be Loved - Death Cab For Cutie
- 5 Dancing In The Moonlight - The Smashing Pumpkins
- 6 Take The Long Way Round - Teenage Fanclub
- 7 Don't Make Me Prove It - Veruca Salt
- 8 The Sacred And Profane - Smashing Pumpkins, The
- 9 Everything Is Alright - Motion City Soundtrack
- 10 Trains, brains & rain - The Flaming Lips
- 11 No One Needs To Know - Ozma
- 12 What Is Your Secret - Nada Surf
- 13 The Spark That Bled - Flaming Lips, The
- 14 Defending The Faith - Nerf Herder

Where song order rules

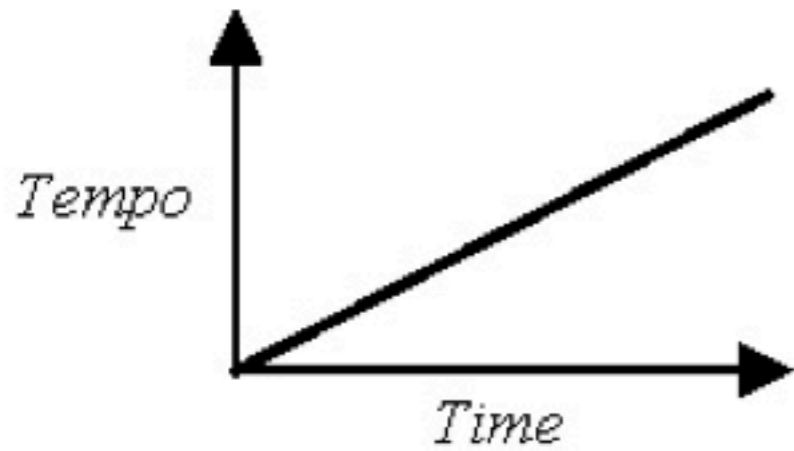
The Dance DJ

- For the Dance DJ - song order and transitions are especially important
- Primary goal: make people dance
- How?
 - Selecting
 - tracks that mix well
 - takes the audience on a journey
 - audience feedback is important
 - Mixing
 - seamless song transitions

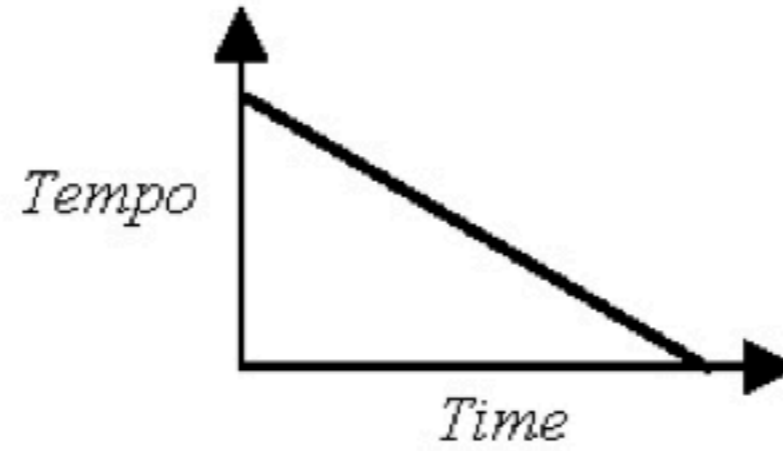


Is the DJ an Artist?
Is a mixset a piece of art?

Tempo Trajectories



Warmup

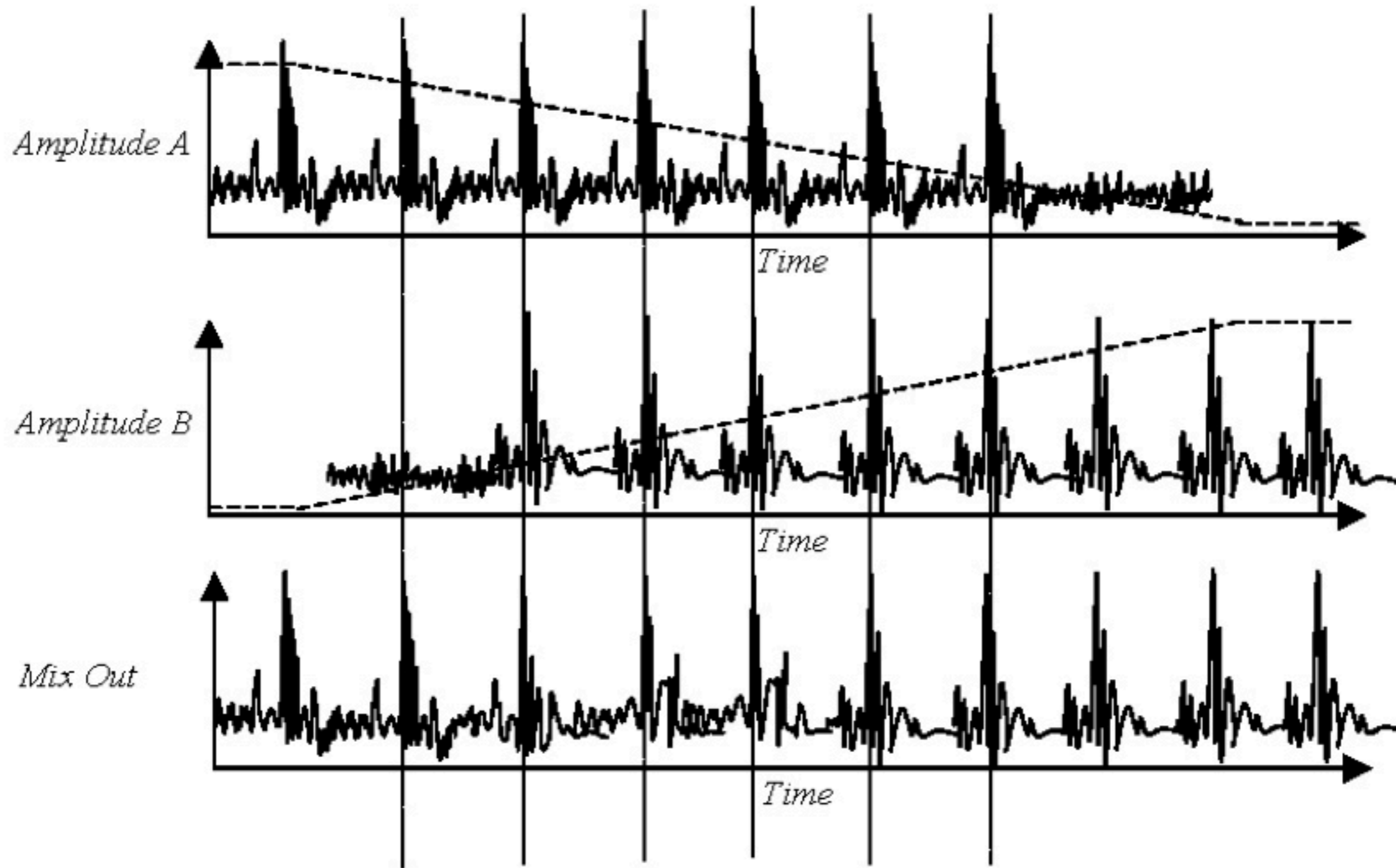


Cool down



Nightclub

Coherence Song to Song



Beat Matching and Cross-fading

Don't underestimate the power of the shuffle



Don't underestimate the power of the shuffle



laugh-out-loud pleasurable

Don't underestimate the power of the shuffle



white-knuckle ride

Don't underestimate the power of the shuffle



“...teaches me connections between disparate kinds of music and the infinite void. I understand the universe better”

Don't underestimate the power of the shuffle



*..forge(ing) new connections
between my heart and my ears*

Don't underestimate the power of the shuffle



each randomly-sequenced track like an aural postcard

Don't underestimate the power of the shuffle



had made me re-examine things I thought I knew about my favourite music

Don't underestimate the power of the shuffle



*...hear(ing) songs that I haven't heard for years and fall
(ing) in love with them again*

Don't underestimate the power of the shuffle



Random shuffle can turn large music libraries into an 'Aladdin's cave' of aural surprises

Don't underestimate the power of the shuffle



...the random effect delivers a sequence of music so perfectly thematically 'in tune' that (it) is quite unsettling

Serendipity of the shuffle



Finding meaningful experience in chance encounters

- Serendipity can improve the listening experience
- Choosing songs randomly from a personal collection can yield serendipitous listening
- Drawing from too large, or too small of a collection reduces serendipity

People like shuffle play

| | | content organisation | | |
|---------------------|------------|----------------------|---------------|-----|
| | | constrained | unconstrained | |
| preferred listening | shuffle | 22 | 69 | 91 |
| | both | 4 | 4 | 8 |
| | sequential | 13 | 1 | 14 |
| | | 39 | 74 | 113 |

Table 1. Preferred listening mode (shuffle or sequential) and organisation of music content (constrained or unconstrained)

People shuffle genres, albums and playlists

Playlist tradeoffs

Variety



Coherence

Freshness



Familiarity

Surprise



Order

Different listeners have different optimal settings

Mood and context can affect optimal settings

Playlist Variety

A good playlist is not a bag of similar tracks

| # | Track | Album | Artist | Genre |
|----|-------------------------------|---------------------------|-----------------------|-------|
| 1 | Farrakorn | Party Patrol | Pizzle | Punk |
| 2 | What's Wrong with my foot? | Party Patrol | Pizzle | Punk |
| 3 | I love her to Pieces | Party Patrol | Pizzle | Punk |
| 4 | In my livid eyes | Party Patrol | Pizzle | Punk |
| 5 | A little exposure | Party Patrol | Pizzle | Punk |
| 6 | Donkey Punch | Party Patrol | Pizzle | Punk |
| 7 | Wow! | Gimme Some | Nova Express | Punk |
| 8 | Flowers on the Wall | Party Patrol | Pizzle | Punk |
| 9 | Wet Brain | Party Patrol | Pizzle | Punk |
| 10 | Tammy ate a bad piece of pork | Party Patrol | Pizzle | Punk |
| 11 | Pucker String | Party Patrol | Pizzle | Punk |
| 12 | Pizzle: Party Patrol | High Energy Rock and Roll | Magnatune Compilation | Rock |
| 13 | Nunchukkaboot | Party Patrol | Pizzle | Punk |
| 14 | Party Patrol | Party Patrol | Pizzle | Punk |
| 15 | Motorway | Gimme Some | Nova Express | Punk |

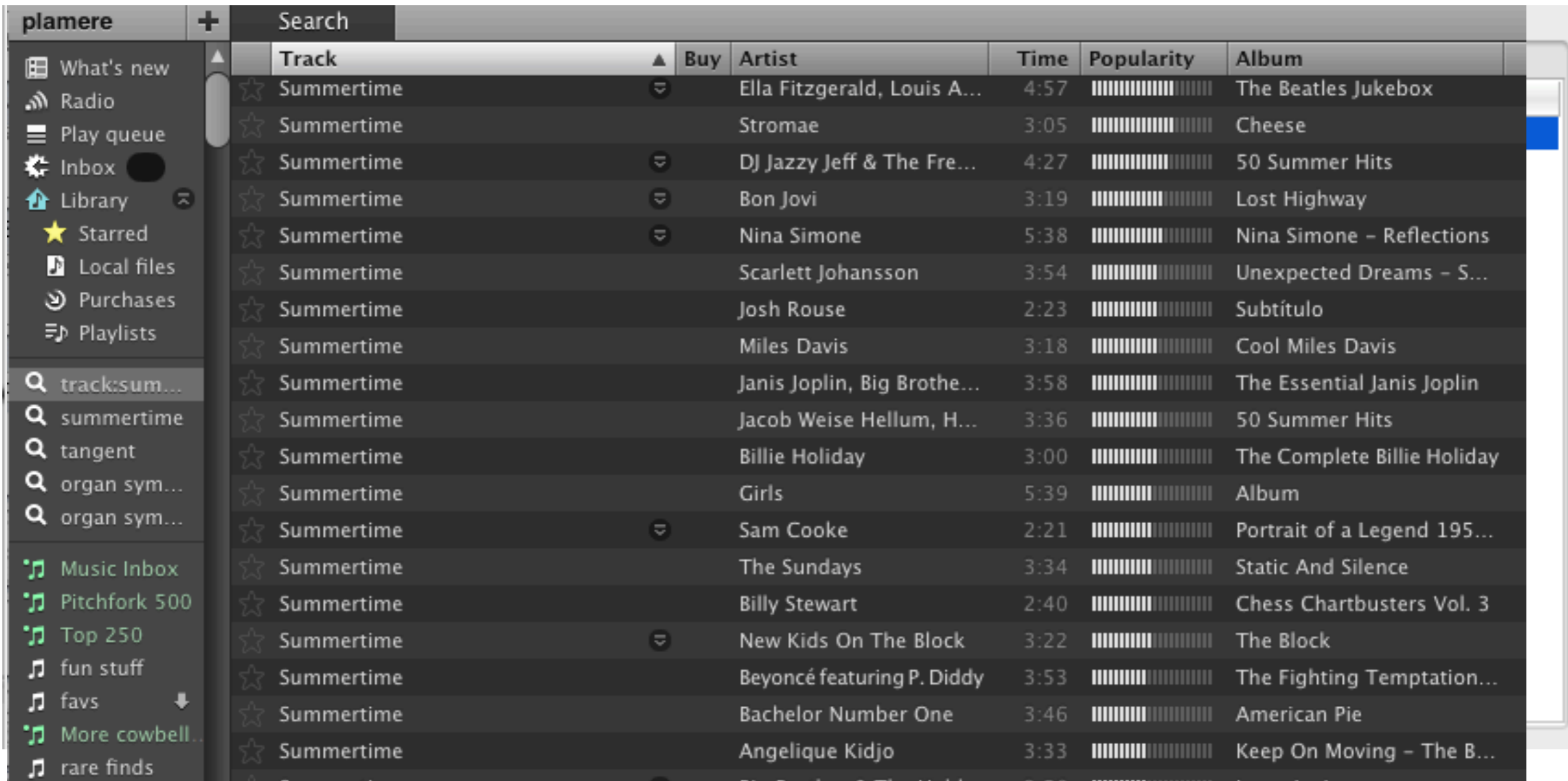
Playlist Variety

A good playlist is not a bag of similar tracks

| # | Track | Album | Artist | Genre |
|----|---------------------------------|-----------------------------|--------------------------|-----------|
| 1 | Pizzle: In my livid eyes | High Energy Rock and Roll | Magnatune Compilation | Rock |
| 2 | In my livid eyes | Party Patrol | Pizzle | Punk |
| 3 | Wow! | Gimme Some | Nova Express | Punk |
| 4 | Euthanize Tunnel Zone | Hellavator Musick | Skitzo | Metal |
| 5 | Hostage Situation | Listen Up, Baby! | Electric Frankenstein | Punk |
| 6 | Dirty brown duster | Jacksploitation | Jackalopes | Punk |
| 7 | Park that ass | Geeking Dream | The Strap Ons | Punk |
| 8 | Higher education | Thrill Hype | The Napoleon Blown Apart | Punk Rock |
| 9 | KC rip off | Up from the mud | Spinecar | Hard Rock |
| 10 | As it Descends | Night of the Black Wyvern | Utopia Banished | Metal |
| 11 | No Cure | 8 Seconds | Pain Factor | Metal |
| 12 | Everyday Like Saturday (bonu... | Middle Age Suicide | Rocket City Riot | Rock |
| 13 | Function | Trancelucent | Somadrone | Rock |
| 14 | Feverdream #1 | Alpha & Oranges | Atomic Opera | Hard Rock |
| 15 | Look And Feel Years Younger | I Don't Know What I'm Doing | Brad Sucks | Rock |

Playlist Variety

A good playlist is not a bag of similar tracks



The screenshot shows a music application interface with a search results table. The table has columns for Track, Buy, Artist, Time, Popularity, and Album. The search results are for the query 'summertime' and show a variety of tracks from different artists and albums.

| Track | Buy | Artist | Time | Popularity | Album |
|------------|-----|-----------------------------|------|----------------------|-----------------------------|
| Summertime | | Ella Fitzgerald, Louis A... | 4:57 | ████████████████████ | The Beatles Jukebox |
| Summertime | | Stromae | 3:05 | ████████████████████ | Cheese |
| Summertime | | DJ Jazzy Jeff & The Fre... | 4:27 | ████████████████████ | 50 Summer Hits |
| Summertime | | Bon Jovi | 3:19 | ████████████████████ | Lost Highway |
| Summertime | | Nina Simone | 5:38 | ████████████████████ | Nina Simone - Reflections |
| Summertime | | Scarlett Johansson | 3:54 | ████████████████████ | Unexpected Dreams - S... |
| Summertime | | Josh Rouse | 2:23 | ████████████████████ | Subtítulo |
| Summertime | | Miles Davis | 3:18 | ████████████████████ | Cool Miles Davis |
| Summertime | | Janis Joplin, Big Brothe... | 3:58 | ████████████████████ | The Essential Janis Joplin |
| Summertime | | Jacob Weise Hellum, H... | 3:36 | ████████████████████ | 50 Summer Hits |
| Summertime | | Billie Holiday | 3:00 | ████████████████████ | The Complete Billie Holiday |
| Summertime | | Girls | 5:39 | ████████████████████ | Album |
| Summertime | | Sam Cooke | 2:21 | ████████████████████ | Portrait of a Legend 195... |
| Summertime | | The Sundays | 3:34 | ████████████████████ | Static And Silence |
| Summertime | | Billy Stewart | 2:40 | ████████████████████ | Chess Chartbusters Vol. 3 |
| Summertime | | New Kids On The Block | 3:22 | ████████████████████ | The Block |
| Summertime | | Beyoncé featuring P. Diddy | 3:53 | ████████████████████ | The Fighting Temptation... |
| Summertime | | Bachelor Number One | 3:46 | ████████████████████ | American Pie |
| Summertime | | Angelique Kidjo | 3:33 | ████████████████████ | Keep On Moving - The B... |

Playlisting is not Recommendation

Playlisting is not Recommendation

Recommendation

Playlist

Playlisting is not Recommendation

| Recommendation | Playlist |
|-------------------------------|-------------------------------|
| Primarily for music discovery | Primarily for music listening |

Playlisting is not Recommendation

| Recommendation | Playlist |
|-------------------------------|-------------------------------|
| Primarily for music discovery | Primarily for music listening |
| Minimize familiar artists | Familiar artists in abundance |

Playlisting is not Recommendation

| Recommendation | Playlist |
|-------------------------------|-------------------------------|
| Primarily for music discovery | Primarily for music listening |
| Minimize familiar artists | Familiar artists in abundance |
| Order not important | Order can be critical |

Playlisting is not Recommendation

| Recommendation | Playlist |
|-------------------------------|--|
| Primarily for music discovery | Primarily for music listening |
| Minimize familiar artists | Familiar artists in abundance |
| Order not important | Order can be critical |
| Limited Context (shopping) | Rich contexts - party, jogging, working, gifts |

Playlisting is not Recommendation

| Recommendation | Playlist |
|-------------------------------|--|
| Primarily for music discovery | Primarily for music listening |
| Minimize familiar artists | Familiar artists in abundance |
| Order not important | Order can be critical |
| Limited Context (shopping) | Rich contexts - party, jogging, working, gifts |

However, playlists may be better vector for music discovery than traditional recommendation

Playlisting nuts and bolts formats and rules

Playlist formats

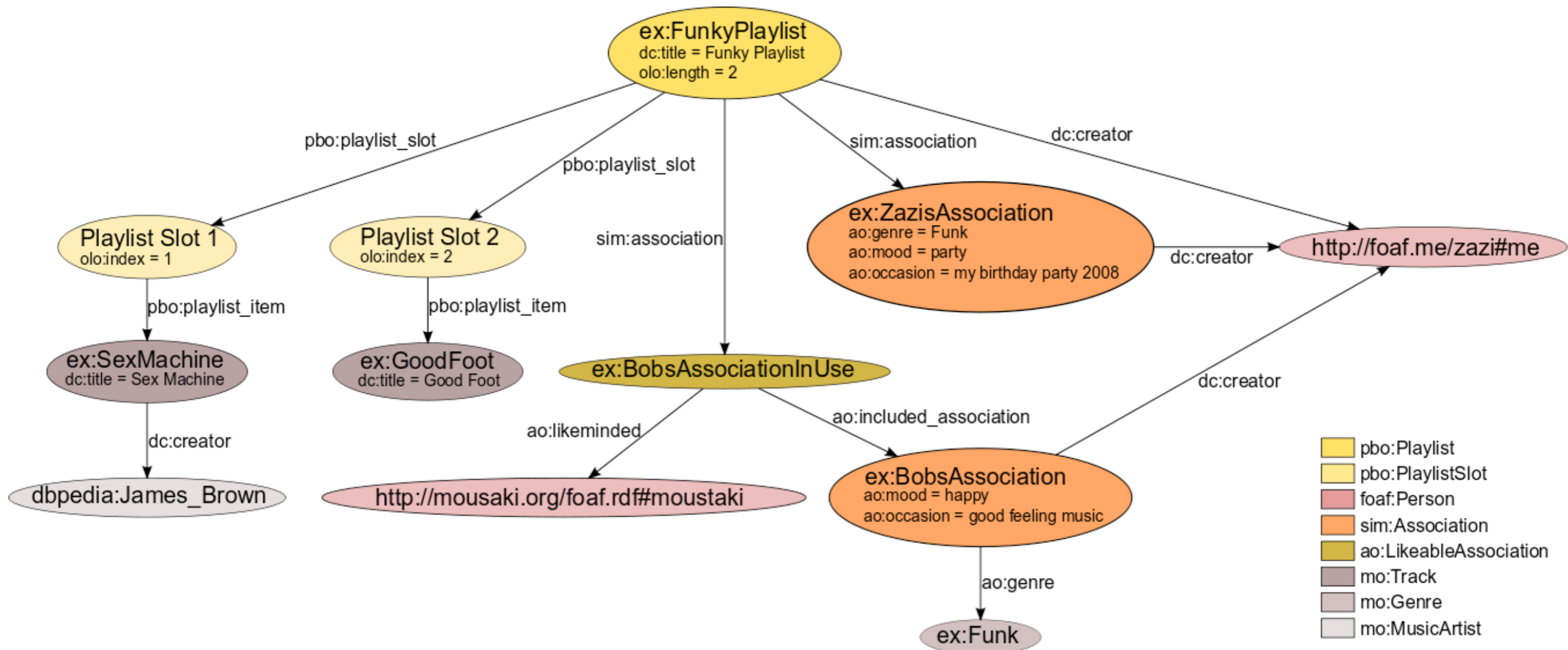
- Lots of formats - Some notable examples:
 - M3U - simple list of files - one per line
 - XSPF - 'spiff' - XML based format
 - The Playback Ontology
- Resources:
 - <http://microformats.org/wiki/audio-info-formats>
 - <http://lizzy.sourceforge.net/docs/formats.html>
 - <http://gonze.com/playlists/playlist-format-survey.html>

Example XSPF

```
<?xml version="1.0" encoding="UTF-8"?>
<playlist version="1" xmlns="http://xspf.org/ns/0/">
  <trackList>
    <track>
      <location>http://example.com/song_1.mp3</location>
      <creator>Led Zeppelin</creator>
      <album>Houses of the Holy</album>
      <title>No Quarter</title>
      <annotation>I love this song</annotation>
      <duration>271066</duration>
      <image>http://images.amazon.com/images/P/B000002J0B.jpg</image>
      <info>http://example.com</info>
    </track>
    <track>
      <location>http://example.com/song_1.mp3</location>
      <creator>Led Zeppelin</creator>
      <album>ii</album>
      <title>No Quarter</title>
      <annotation>This one too</annotation>
      <duration>271066</duration>
      <image>http://images.amazon.com/images/P/B000002J0B.jpg</image>
      <info>http://example.com</info>
    </track>
  </trackList>
</playlist>
```

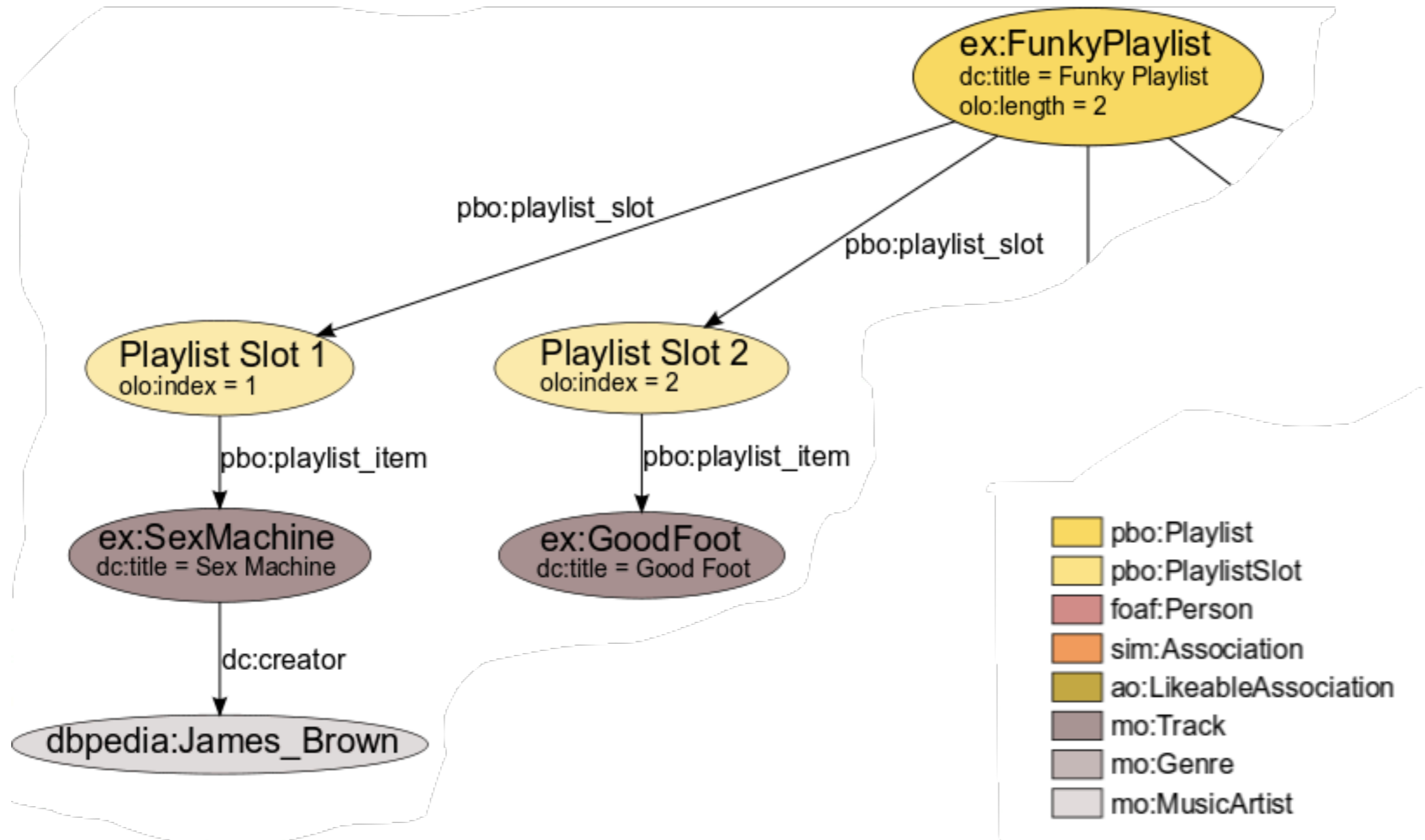
The Playback Ontology

The *Play Back Ontology* provides basic concepts and properties for describing concepts that are related to the *play back domain*, e.g. a [playlist](#), [play back](#) and [skip counter](#), on/ for the Semantic Web.



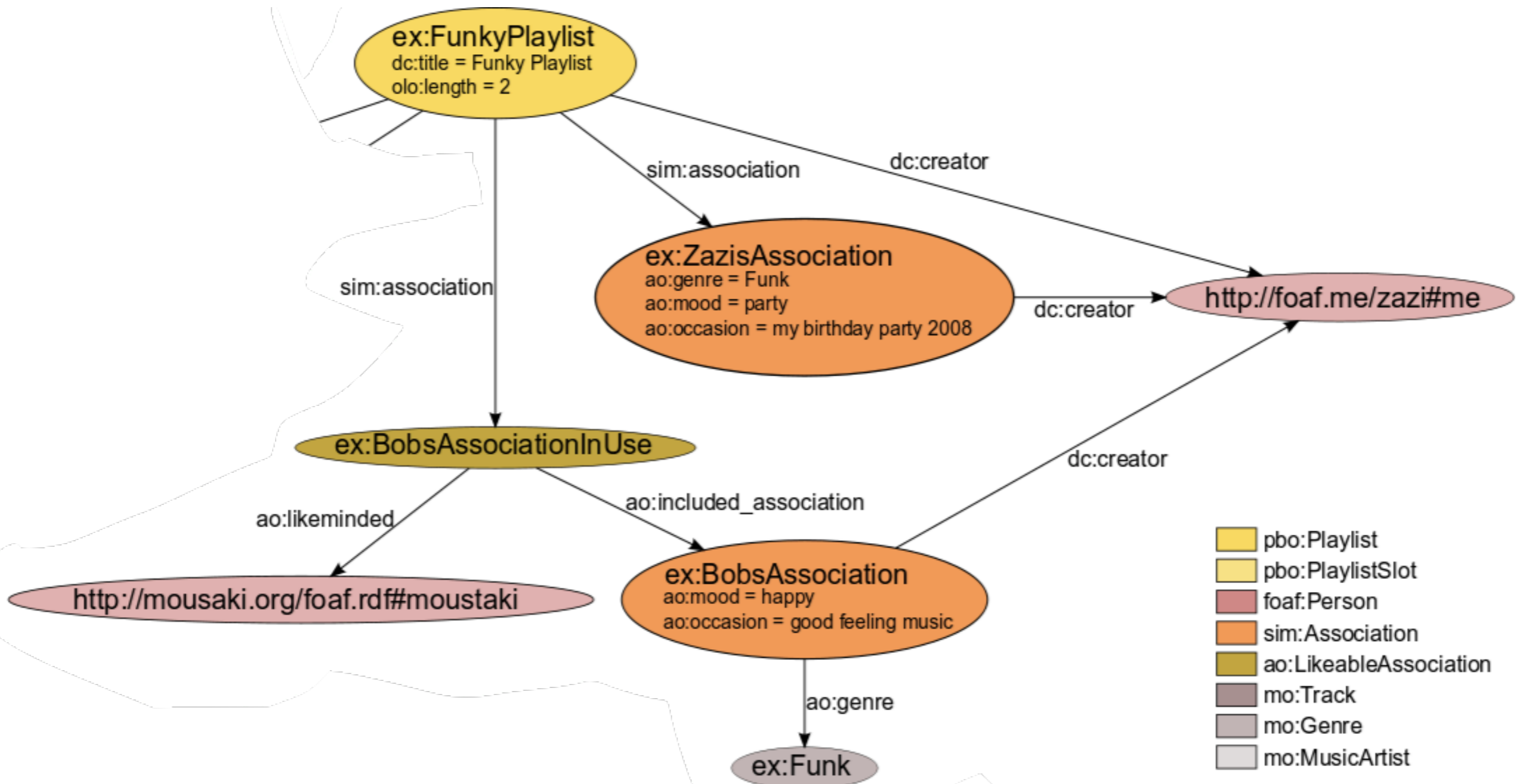
The Playback Ontology

Modeling items in the playlist by extending the ordered list ontology



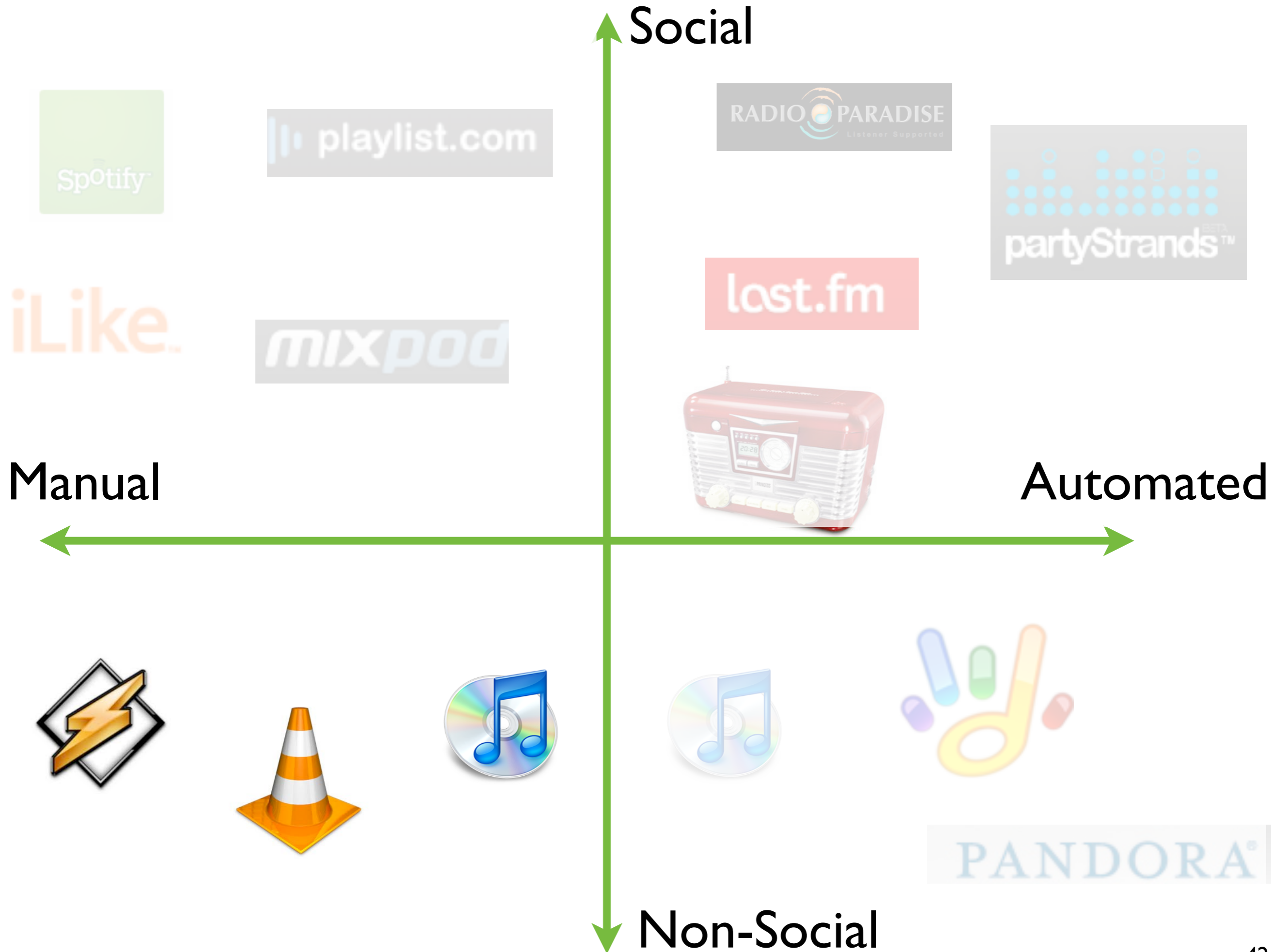
The Playback Ontology

Expressing similarity and creation provenance

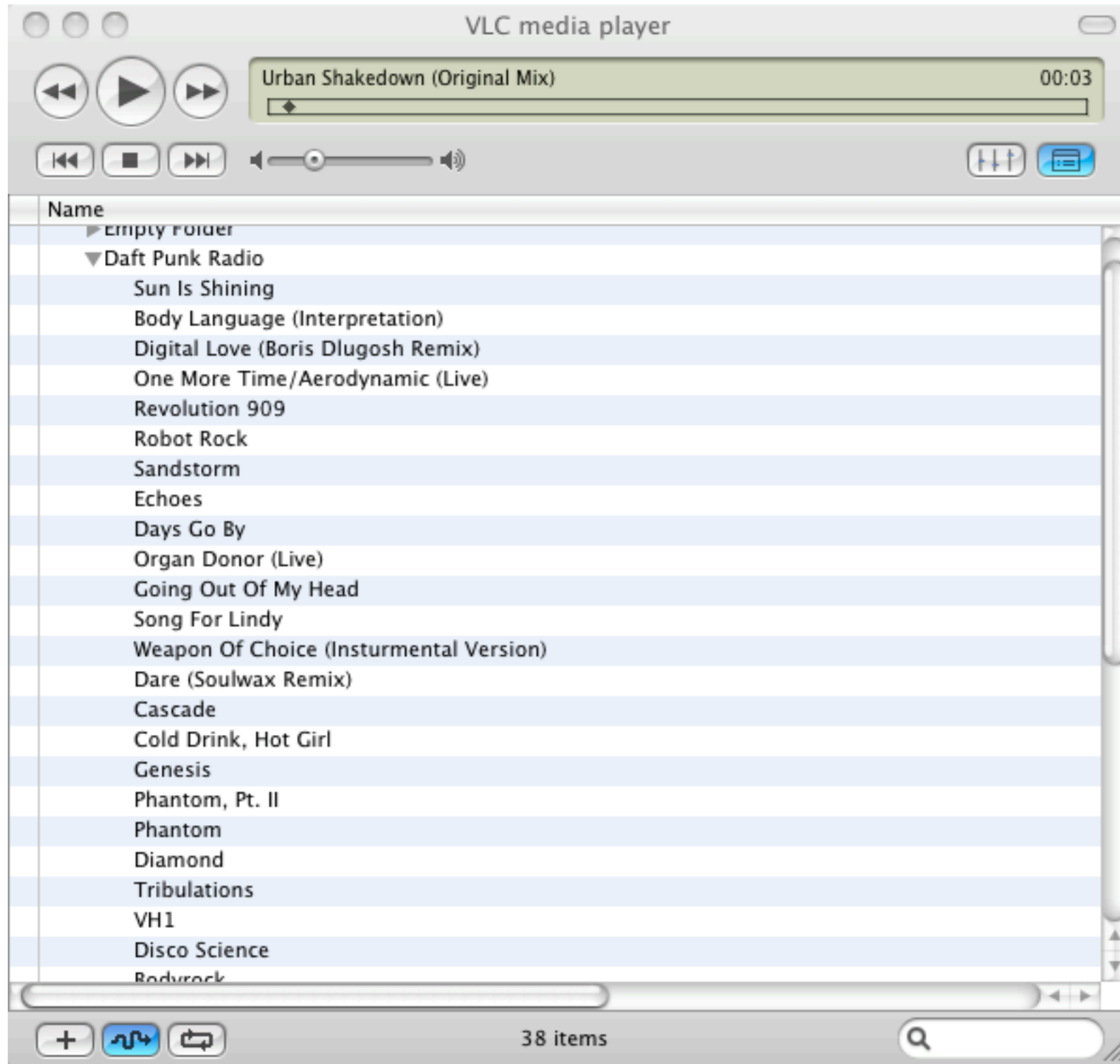


Survey of playlisting systems and tools



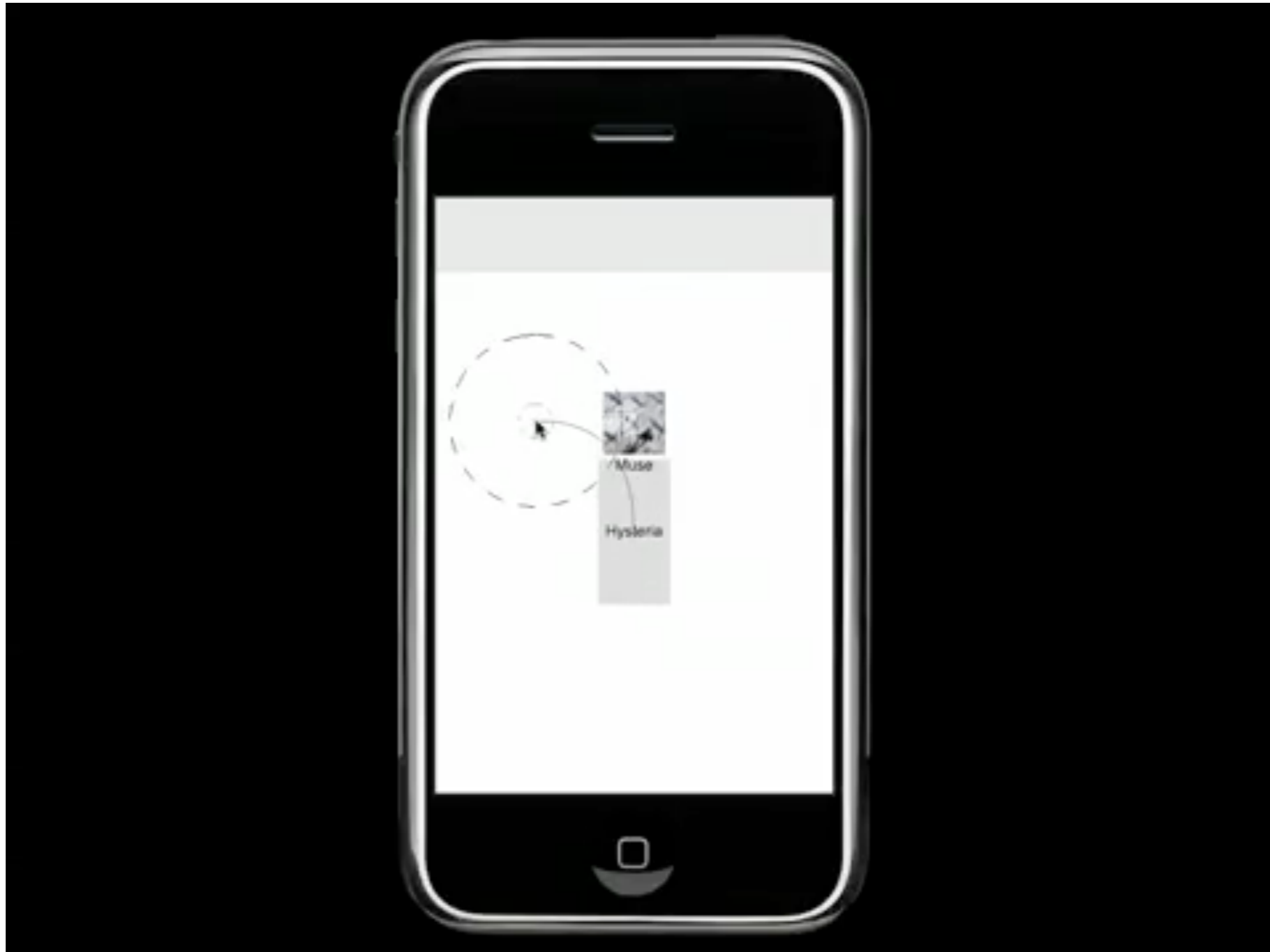


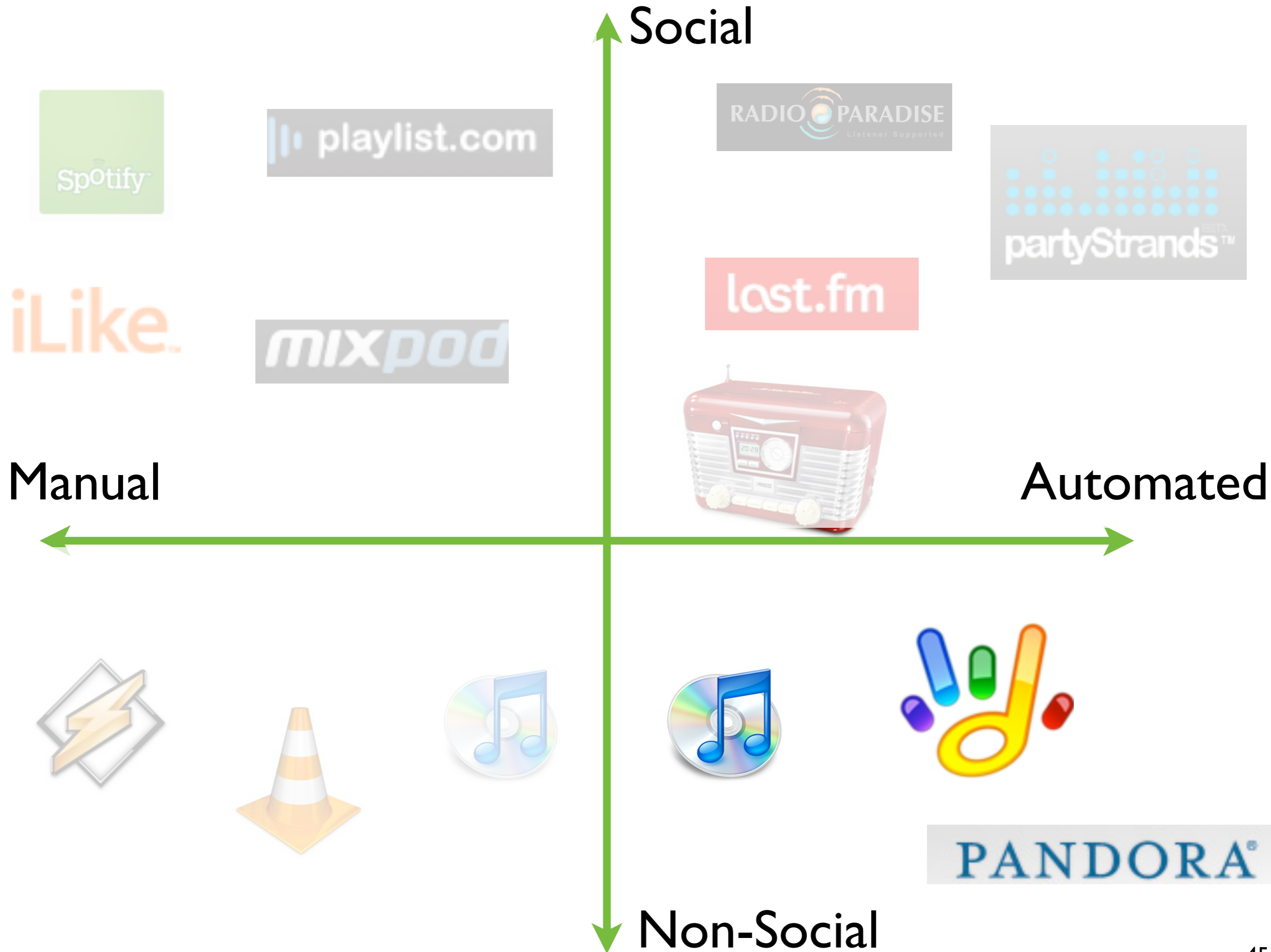
Manual Non-Social



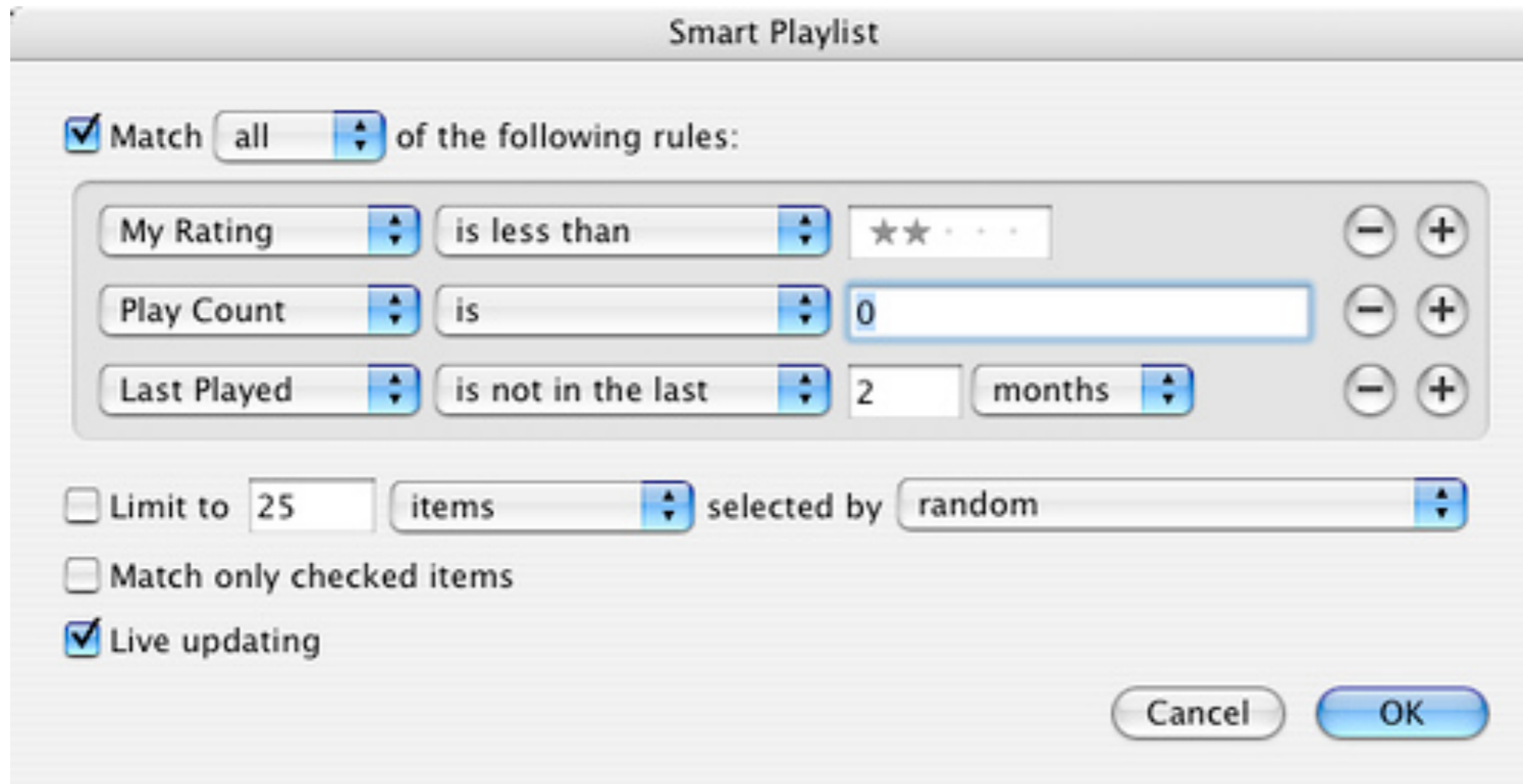
Rush: Repeated Recommendations on Mobile Devices

Rush: Repeated Recommendations on Mobile Devices





Playlist creation tools



Playlist creation tools

The screenshot shows the 'Smart Playlist' dialog box in iTunes. The left-hand menu lists various criteria for playlist creation, with 'Artist' selected. The main area shows the criteria 'contains' and 'selected by random'. The background shows a list of media items with columns for Name, Duration, Date Added, and Media Kind.

| Name | Duration | Date Added | Media Kind |
|--|------------------|------------|------------|
| It miss a live DiggNation! From the nerd-... | MPEG-4 video ... | 47:16 | 7/27/10 |
| Week Kevin and Alex have put together cli... | MPEG-4 video ... | 31:36 | 7/20/10 |
| be, Alex has put together his favorite bo... | MPEG-4 video ... | 37:46 | 7/13/10 |
| Week as we cover the dreaded Red Ring of ... | MPEG-4 video ... | 54:02 | 7/6/10 |
| San Francisco celebrates Revision3's 5th Birthday! ... | MPEG-4 video ... | 40:02 | 6/30/10 |
| San Francisco! Join this week's discussion a... | | | 6/22/10 |
| favorite wine & beer bar in SF, the Hotel B... | | | 6/15/10 |
| Simpler Times; the beer for when times ... | | | 6/8/10 |
| Glenn's place, it's Tea Time with Kevin ... | | | 6/2/10 |
| to know about Facebook privacy! Kevin th... | | | 5/25/10 |
| does the impossible trick that only 2 peo... | | | 5/18/10 |
| Join the guys as they talk about fast food... | | | 5/11/10 |
| day on DiggNation! Plus, Kevin talks abo... | | | 5/4/10 |
| , and blood of love, two lucky fanboys go... | | | 4/27/10 |
| s week, DiggNation is visited by the man ... | | | 4/20/10 |
| ...a." THE NEW YORK TIMES "One visionary ... | MPEG audio file | 22:31 | 6/8/10 |
| | QuickTime mo... | 2:50 | 5/28/09 |
| | AAC audio file | 1:18:42 | 8/14/09 |
| | MPEG audio file | 2:51 | 11/29/08 |
| ...n evolution with Dawkins, Jones, and Wol... | MPEG audio file | 1:21:49 | 7/20/07 |
| ...ago featuring reviews, interviews, top 5 li... | MPEG audio file | | 7/23/10 |
| ...this week as Matty "Beefcake" Ballgame a... | MPEG audio file | 1:30:23 | 7/23/10 |
| ...night. Want to hear it? Adam and Matty di... | MPEG audio file | 1:29:57 | 7/16/10 |
| ...omprised solely of a shirtless, lupine Matt... | MPEG audio file | 55:22 | 7/9/10 |
| ...il weekly format for a Listener Feedback-f... | MPEG audio file | 36:29 | 6/25/10 |
| ...a conversation with "Cyrus" star John C. ... | MPEG audio file | 1:16:56 | 6/18/10 |
| ...tinue for episode #300, Adam and Matty ... | | 59:20 | 4/22/10 |

Do people use Smart Playlists?

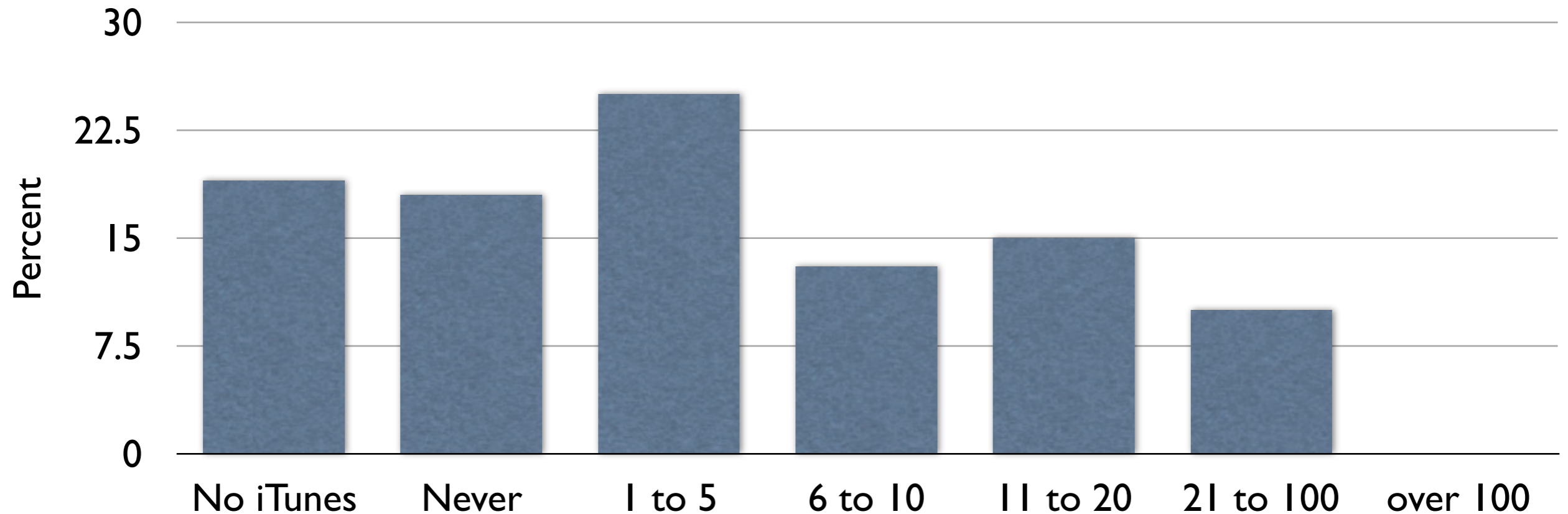
Do you use iTunes Smart Playlists?

- I don't use iTunes
 - I have never created a Smart Playlist
 - I have created 1 to 5 Smart Playlists
 - I have created 6 to 10 Smart Playlists
 - I have created 11 to 20 Smart Playlists
 - I have created 21 to 100 Smart Playlists
 - I have created over 100 Smart Playlists
-

Vote

[View Results](#) [Share This](#) [Create A Poll](#)

Do people use Smart Playlists?



62% of polled have 5 or less smart playlists

Informal poll with 162 respondents

Automated Non-Social iTunes Genius Mix



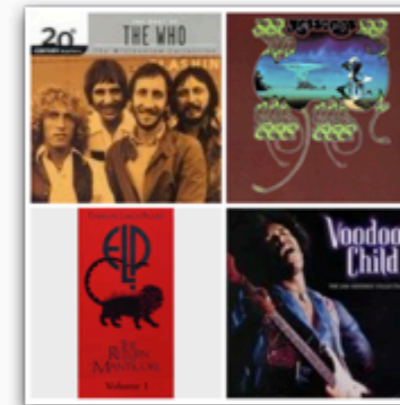
Alternative Pop/Rock Mix



Brit-Pop & Rock Mix



Adult Alternative Mix



Classic Rock Mix



Punk Mix



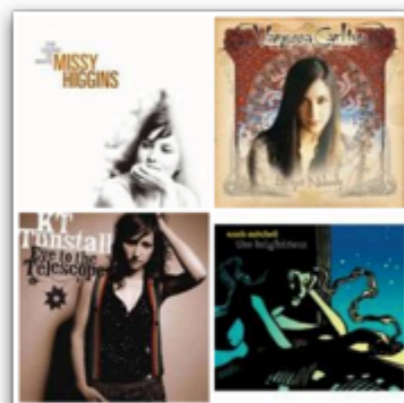
Chamber Pop Mix



Jazz Mix



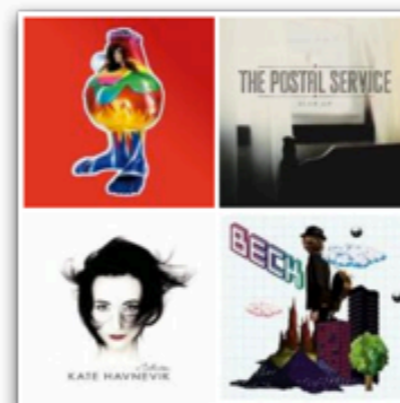
Indie Rock & Lo-Fi Mix



Singer/Songwriter Mix



Traditional Folk Mix

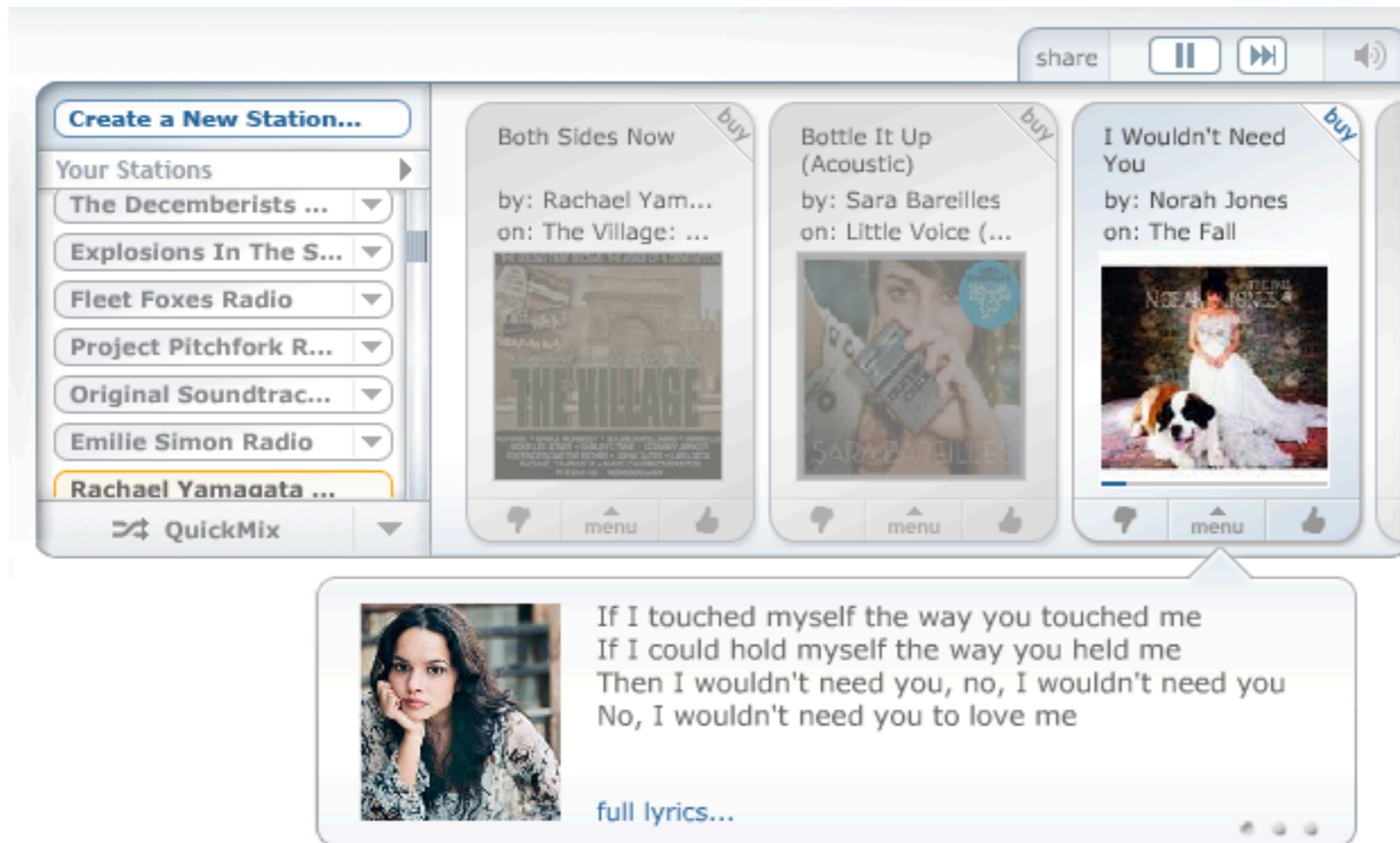


Electro-Pop Mix



Alt Metal Mix

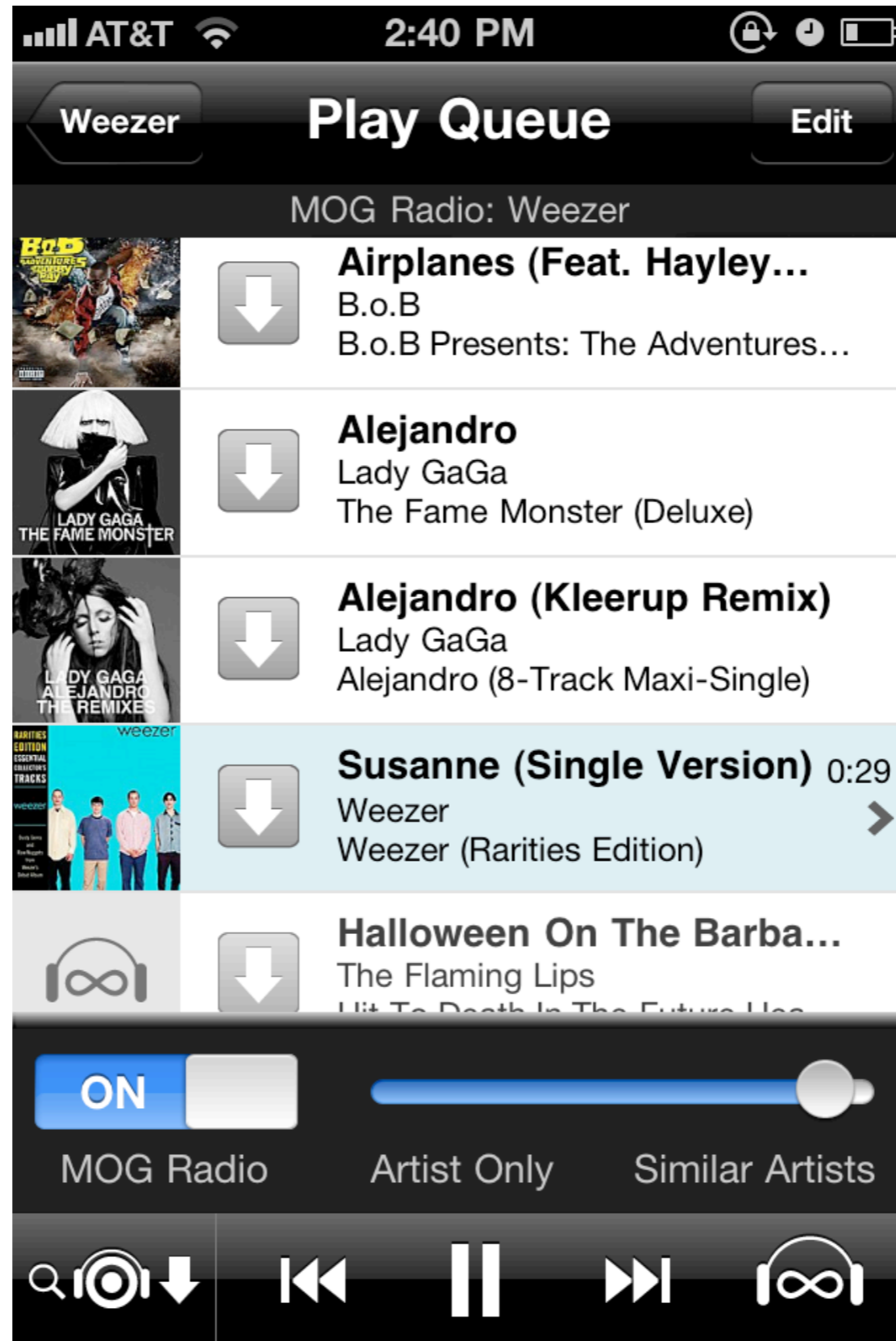
Automated Non-Social



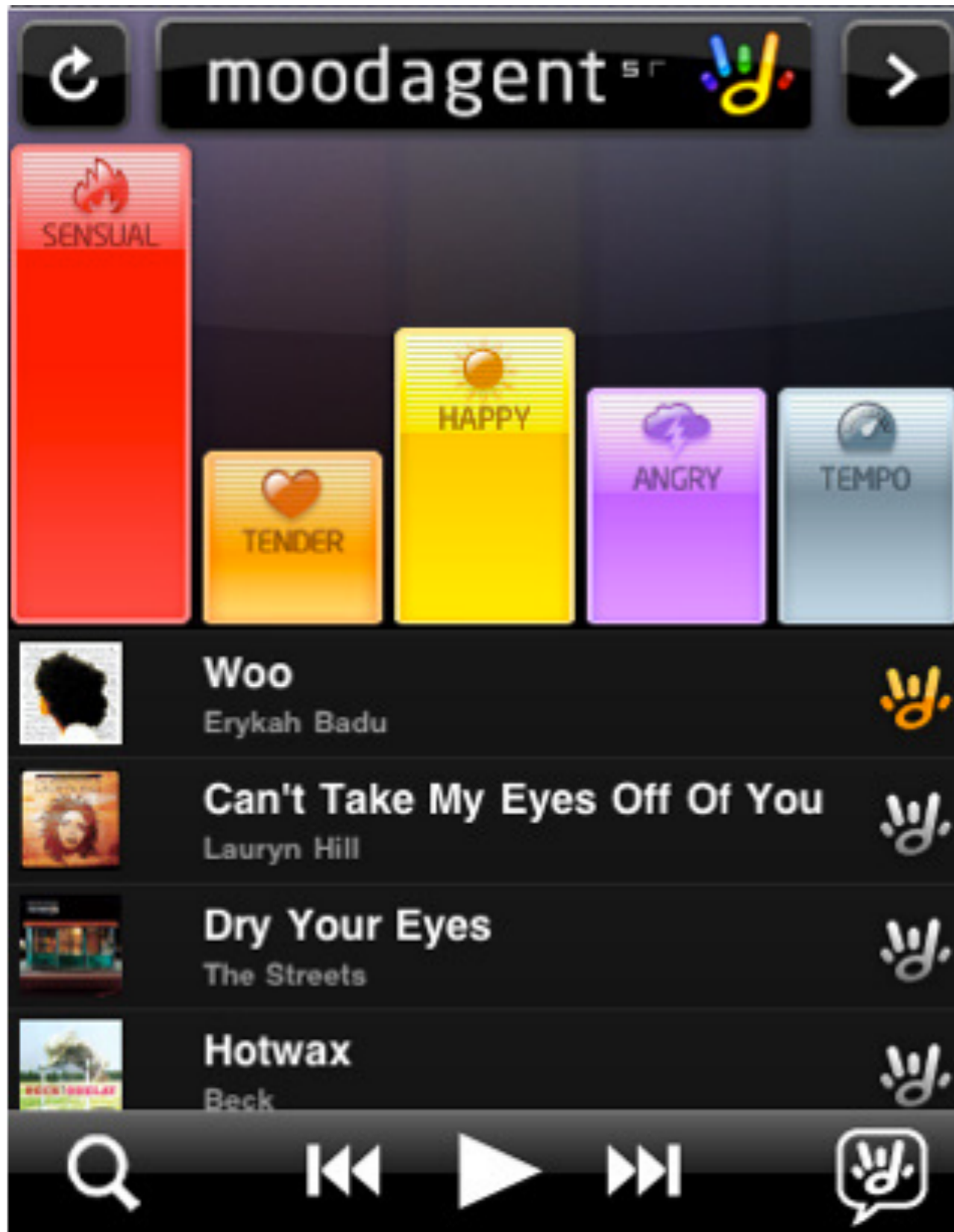
The image shows a music player interface with a sidebar on the left and a main content area. The sidebar includes a 'Create a New Station...' button and a list of 'Your Stations' with dropdown menus: 'The Decemberists ...', 'Explosions In The S...', 'Fleet Foxes Radio', 'Project Pitchfork R...', 'Original Soundtrac...', 'Emilie Simon Radio', and 'Rachael Yamagata ...'. Below the stations is a 'QuickMix' button. The main content area displays three song cards, each with a 'buy' button in the top right corner. The first card is 'Both Sides Now' by Rachael Yamagata on 'The Village: ...'. The second card is 'Bottle It Up (Acoustic)' by Sara Bareilles on 'Little Voice (...'. The third card is 'I Wouldn't Need You' by Norah Jones on 'The Fall'. Below the third card, a lyrics popup is visible, featuring a small portrait of Norah Jones and the following lyrics: 'If I touched myself the way you touched me / If I could hold myself the way you held me / Then I wouldn't need you, no, I wouldn't need you / No, I wouldn't need you to love me'. A 'full lyrics...' link is at the bottom of the popup. At the top right of the music player, there are 'share', 'pause', 'play', and 'volume' controls.

Automated Non-Social

MOG



Mood Agent



- Use sliders to set levels of 5 'moods':
 - Sensual
 - Tender
 - Happy
 - Angry
 - Tempo


AMG tapestry

» search » descriptors ✖ OPTIONS

BUILD PLAYLIST ↻ RESET

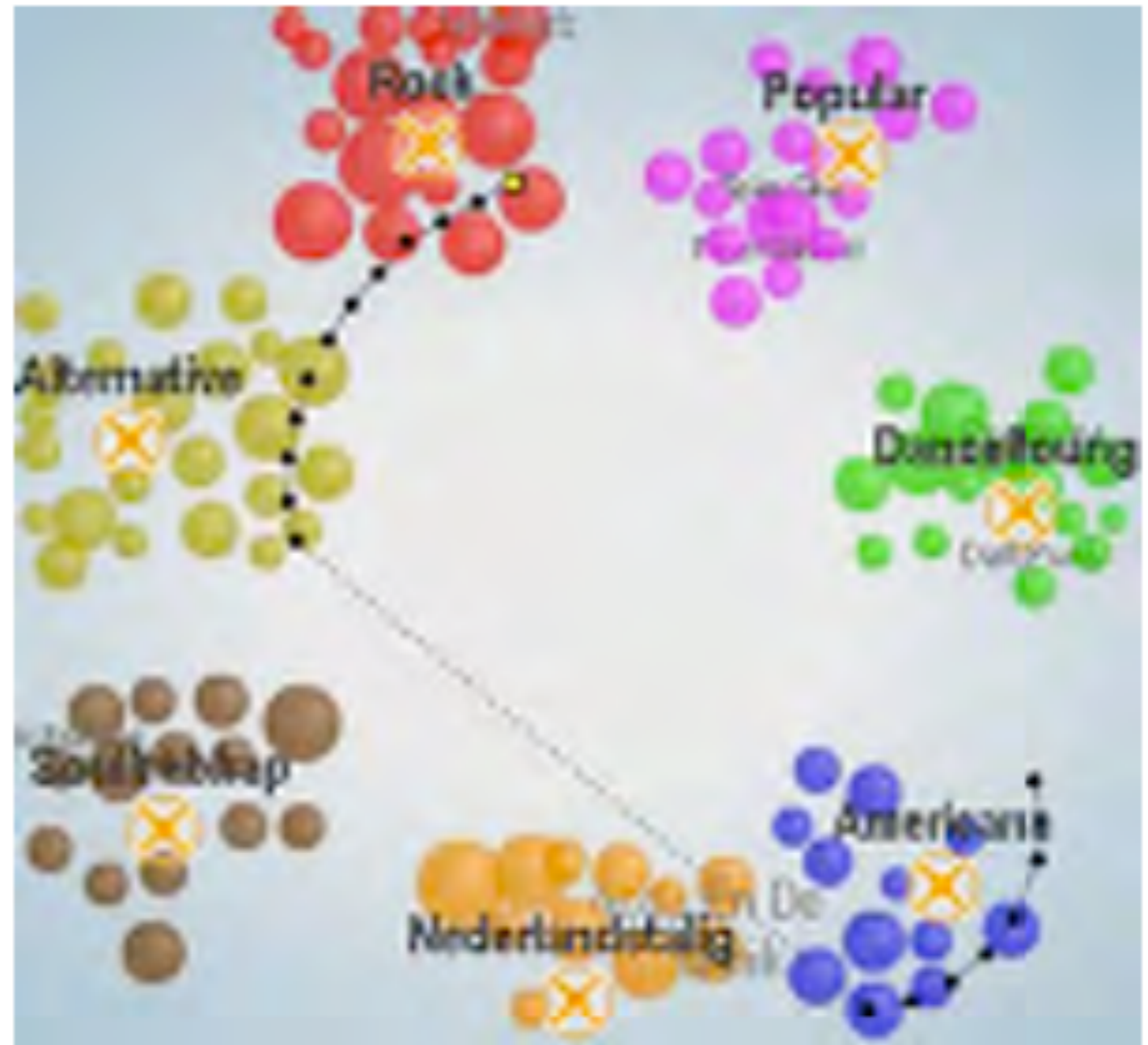
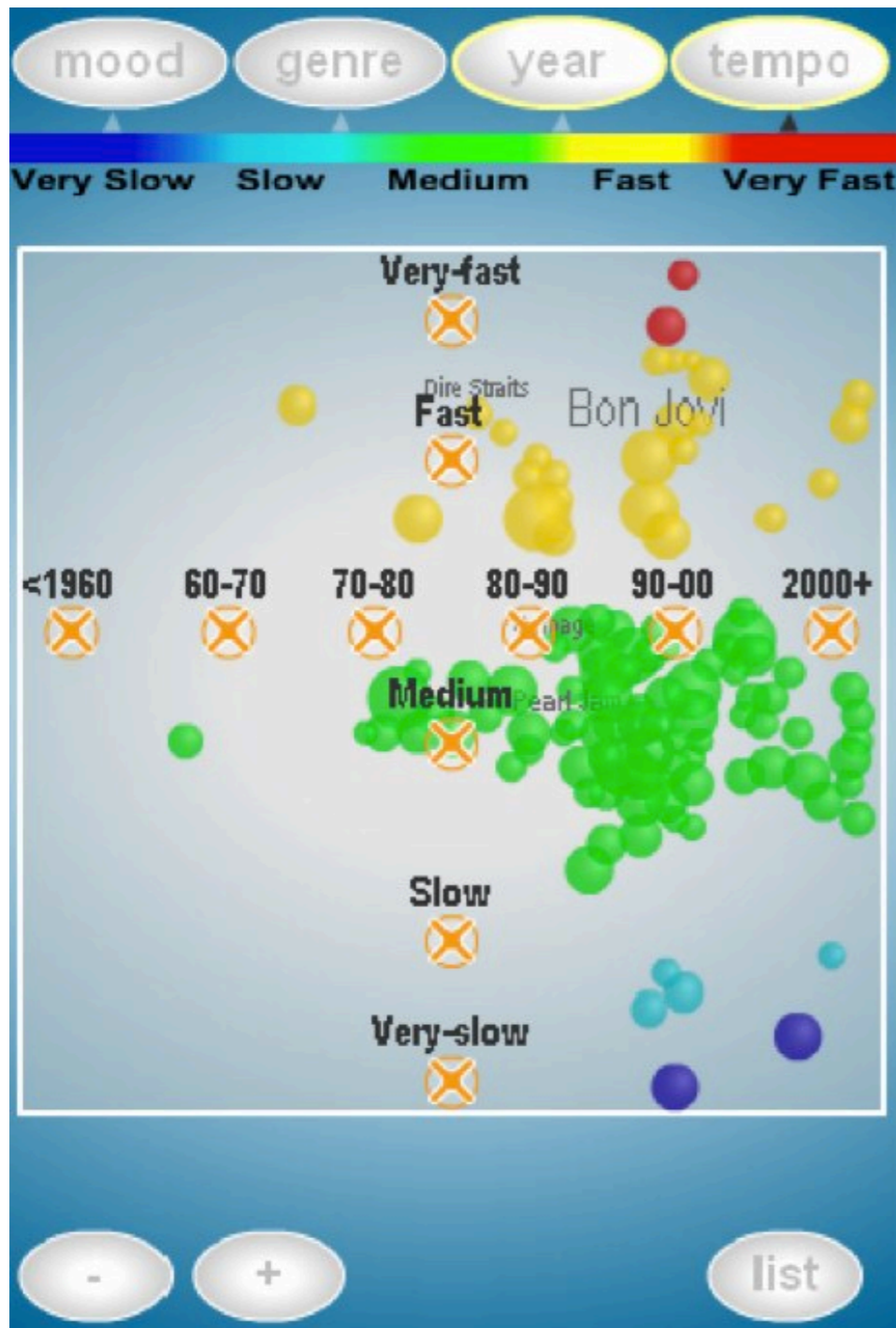
| » genre | » theme | » mood |
|--|---|--|
| <input type="checkbox"/> Blues | <input type="checkbox"/> At the Beach/Pool Party | <input type="checkbox"/> Aggressive/Volatile |
| <input type="checkbox"/> Cajun | <input type="checkbox"/> At the Office/Monday Morning | <input type="checkbox"/> Anxiety/Fear |
| <input type="checkbox"/> Celtic | <input type="checkbox"/> Background/Dinner Ambiance | <input type="checkbox"/> Bleak/Cold |
| <input type="checkbox"/> Children's | <input checked="" type="checkbox"/> Feelin' Good | <input type="checkbox"/> Calm/Relaxed |
| <input type="checkbox"/> Comedy | <input type="checkbox"/> Feelin' Low | <input type="checkbox"/> Cynical/Wry |
| <input type="checkbox"/> Country | <input checked="" type="checkbox"/> Hangin' Out | <input type="checkbox"/> Dramatic/Theatrical |
| <input type="checkbox"/> Easy Listening | <input type="checkbox"/> Happy Holidays/New Years | <input type="checkbox"/> Fun/Good-Natured |
| <input type="checkbox"/> Electronica | <input type="checkbox"/> Heartache/Breakup | <input type="checkbox"/> Organic/Earthy |
| <input type="checkbox"/> Folk | <input type="checkbox"/> Late Night | <input type="checkbox"/> Passionate/Sensual |
| <input type="checkbox"/> Gospel | <input type="checkbox"/> Long Walk/Reminiscing | <input checked="" type="checkbox"/> Refined/Cerebral |
| <input type="checkbox"/> Jazz | <input type="checkbox"/> Party/Celebration | <input type="checkbox"/> Sad/Longing |
| <input type="checkbox"/> Latin | <input type="checkbox"/> Revolutionary/Creativity | <input type="checkbox"/> Slick/Smooth |
| <input type="checkbox"/> New Age | <input type="checkbox"/> Seasons: Autumn | <input type="checkbox"/> Swaggering/Street-Smart |
| <input type="checkbox"/> R&B | <input type="checkbox"/> Seasons: Spring | <input type="checkbox"/> Sweet/Light |
| <input type="checkbox"/> Rap | <input type="checkbox"/> Seasons: Summer | <input type="checkbox"/> Trippy/Druggy |
| <input type="checkbox"/> Reggae | <input type="checkbox"/> Seasons: Winter | <input type="checkbox"/> Upbeat/Boisterous |
| <input checked="" type="checkbox"/> Rock | <input type="checkbox"/> Sweet Dreams/Relaxation | |
| <input type="checkbox"/> Vocal | <input type="checkbox"/> Travel/Driving | |
| <input type="checkbox"/> World | <input type="checkbox"/> Wedding/Anniversary/Prom | |
| | <input type="checkbox"/> With the Family | |

» playlist ▶ LISTEN



The playlist section displays five album covers. From left to right: 1. David Bowie's 'Lodger' (featuring a portrait of Bowie). 2. Christiane F.'s 'Wir Kinder vom Bahnhof Zoo' (featuring a portrait of the artist). 3. A globe with a person on it, likely representing a travel or world theme. 4. A man with a hand on his forehead, possibly representing a mood like 'Refined/Cerebral'. 5. Audio-Visio's 'Audio-Visio' (featuring a stylized face).

Visual Playlist Generation on the Artist Map



Visual Playlist Generation on the Artist Map
Van Gulick, Vignoli

PLAY ALL ▶

Path From Kanye West To Taylor Swift



▶ Say You Will
Kanye West



▶ It's A New Day
will.i.am
 Bypass?



▶ Fergalicious
Fergie
 Bypass?

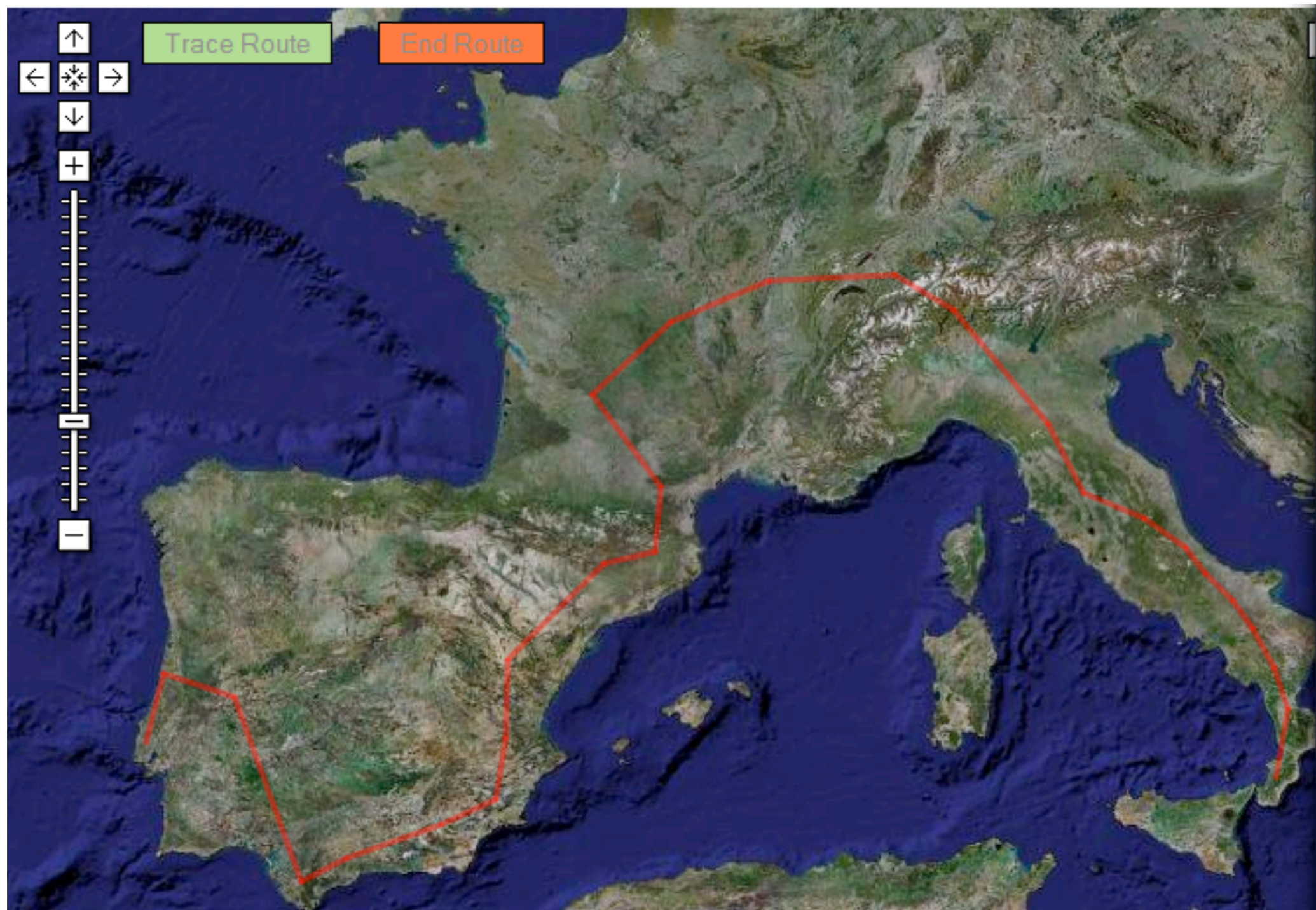


▶ You Are What You Are (Beautiful)
Christina Aguilera
 Bypass?



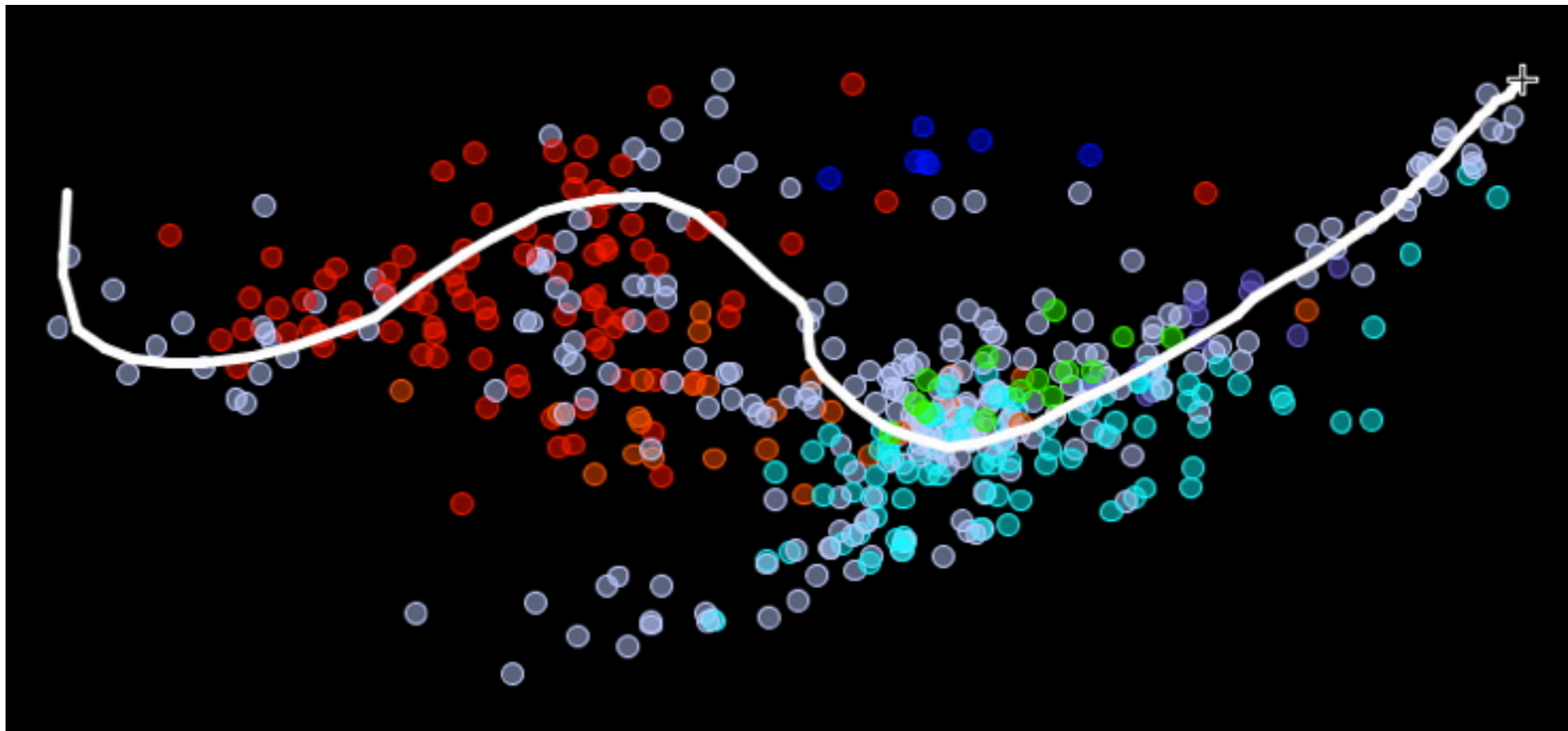
▶ Love Story
Taylor Swift

GeoMuzik



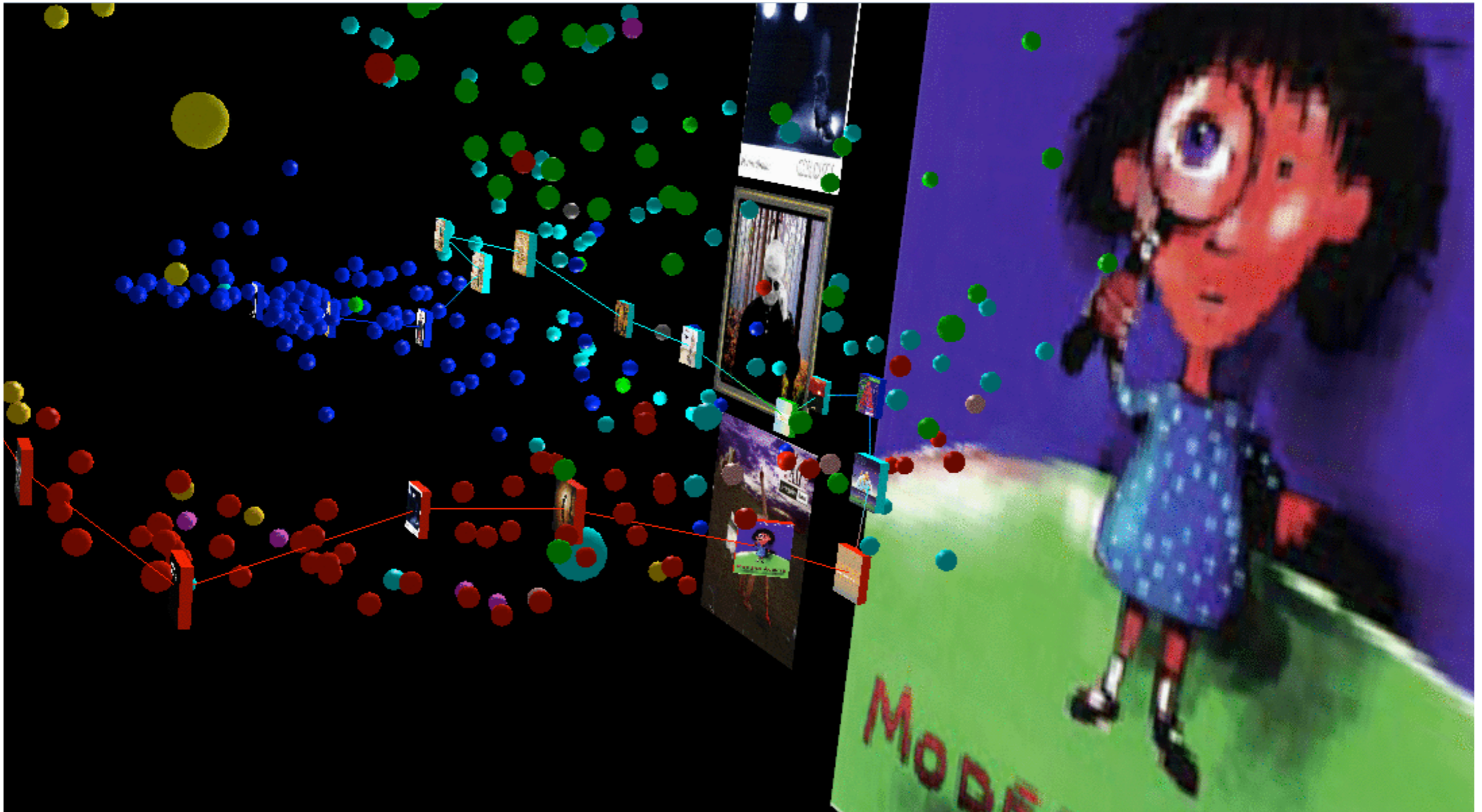
GeoMuzik: A geographic interface for large music collections: Òscar Celma, Marcelo Nunes

Using visualizations to build playlists



MusicBox: Mapping and visualizing music collections
Anita Lillie's Masters Thesis at the MIT Media Lab

Search Inside the Music



Using 3D visualizations to explore and discover music.

Paul Lamere and Doug Eck



Automated Social Last.fm

← Start a new Station Emerson Lake And Palmer

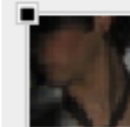
Photo added by Martinchus89

Emerson, Lake & Palmer - Fugue
from Trilogy
00:14 -01:43

lost.fm Music Radio Events Charts Community

Your Friends

Pending Friend Requests (11)



gearmonkey

[See all friend requests](#)

Friends listening now



ocelma

The Cranberries - Zombie - Live -
Stockholm 2002 yesterday evening



hiqlokey

Âme - Junggesellenmaschine
yesterday evening

SHARE [Facebook] [Twitter] [Email]

RADIO PARADISE

Listener Supported

Now Playing:
 Muse - Undisclosed Desires
 Dave Matthews - Trouble
 Jill Barber - Chances
 Dzihan & Kamien - Stiff Jazz

[Log In] [Register]

Home Community Support RP Help & Info Playlist Music/Artists Your Faves LRC/Upload

Buy CD from amazon.com Buy MP3 from amazon.com Download on iTunes

[click here for album info & other purchase options]

Artist: [Dzihan & Kamien](#) [more]
 Song: **Stiff Jazz**
 Album: [Gran Riserva](#) [album info]
 Released: 2002
 Last Played: Jul 26, 2010 - 02:38
 Avg. Rating: 7.1 (Total Ratings: 429)
 Your Rating: (Log in above to Rate)
 Ratings Dist:
 Rate Song: [Rate!]

[Artist Website](#) | [Request this song](#)
[Google Artist Search](#) | [Google Lyrics Search](#)
[Artist Info \(AMG\)](#) | [Song Info \(SongMeanings\)](#)
[Wikipedia Entry](#) | [Tour Schedule \(Pollstar\)](#)

92 comments for this song: [Log in above to post your comment](#)

| | |
|--|---|
| nagsheadlocal (North Carolina, the new New Jersey) | Posted: Jun 24, 2010 - 05:28 Man, do I love a drummer who can mix times and alternate between the upbeat and the downbeat. I'm sitting here nodding at work. |
| shutter (You can't get here from there) | Posted: Jun 02, 2010 - 10:55 yeah, way cool tune. |
| lysisphere (largest contiguous ponderosa forest) | Posted: Jun 02, 2010 - 10:51 That was a sweet transition Bill! |

Automated Social Radio Paradise

DMCA Radio

US rules for Internet streaming radio

- In a single **3 hour period**:
 - No more than **three songs** from the same recording
 - No more than **two songs in a row**, from the same recording
 - No more than **four songs** from the same artist or anthology
 - No more than **three songs in a row** from the same artist or anthology

Note that there are no explicit rules that limit skipping

Terrestrial Radio Programming



Terrestrial Radio Programming

On Air Playlist

Lake of Fire

played at: 8:39am

Nirvana

[artist info](#) [albums](#) [tracks](#) [videos](#) [concerts](#) [photos](#)



PLAY CLIP

SAVE TO PLAYLIST

Download:

- iTunes \$0.99
- Amazon \$0.99
- Ringtone



T.N.T.

AC/DC

8:36am

People of the Sun

Rage Against the Machine

8:33am

In One Ear

Cage the Elephant

8:30am

Bad

U2

8:24am

Black

Pearl Jam

8:18am

Bad Company

Five Finger Death Punch

8:08am

Livin' on the Edge

Aerosmith

8:02am

Radio station programming rules

- Divide the day into a set of 5 (typically) 'dayparts':
Mid-6A, 6A-10A, 10A-3P, 3P-7P, and 7P-12Mid
- For each daypart:
 - Gender, Tempo, Intensity, Mood, Style controls
 - Artist separation controls [global and individual artist]
 - Prior-day horizontal title separation
 - Artist blocks [multiple songs in-a-row by same artist]
 - "Never-Violate" and "Preferred" rules
 - Hour circulation rules

Automated Radio Programming

Sample Edit Rule for RuleSet 1

Rule Type


Rule Type:
RestrictionType:

RuleType is NOT changeable.
To change RuleType or RestrictionType, delete this Rule and add new Rule

Artist Minimum Separation

Preferred Rule: hh:mm
Preferred Violation Points: 0 to 1000 Points
Never-Violate Rule: hh:mm

Sets the amount of separation required in hh:mm before the same artist will repeat. Enter hh:mm [00:00 to 24:00] separation in either or both of the PREFERRED and/or NEVER-VIOLATE boxes above.

 **Natural Broadcast Systems**
Reliable, High Quality Broadcast Management Software
At Prices That Make Sense!

 Natural Log and Natural Music

Automated Radio Programming

Sample Edit Rule for RuleSet 1

Rule Type

Rule Type: Gender
RestrictionType: Max-in-a-Row
Restricted Code: F-Female

RuleType is NOT changeable. To change RuleType or RestrictionType, delete this Rule and add new Rule


Gender F-Female Max-in-a-Row

Preferred Rule: # Songs
Preferred Violation Points: 0 to 1000 Points
Never-Violate Rule: # Songs

The maximum # of songs with Gender code F-Female which may appear without a different Gender code appearing. Enter # songs in either or both of the PREFERRED and/or NEVER-VIOLATE boxes above.

Save
Help
Cancel

 **Natural Broadcast Systems**
Reliable, High Quality Broadcast Management Software
At Prices That Make Sense!



Automated Radio Programming

Sample Edit Rule for RuleSet 1

Rule Type

Rule Type:
RestrictionType:
Restricted Code:


RuleType is NOT changeable.
To change RuleType or RestrictionType, delete this Rule and add new Rule

Tempo 1-Slow Max-in-a-Row

Preferred Rule: # Songs
Preferred Violation Points: 0 to 1000 Points
Never-Violate Rule: # Songs

The maximum # of songs with Tempo code 1-Slow which may appear without a different Tempo code appearing. Enter # songs in either or both of the PREFERRED and/or NEVER-VIOLATE boxes above.

 **Natural Broadcast Systems**
Reliable, High Quality Broadcast Management Software
At Prices That Make Sense!

 Natural Log and Natural Music

Automated Radio Programming

Sample DayPart Codes

File View Songs Help

New Open Delete Print Songs Help Close

Sort by DayPartID


| DayPartID | DayPart Name | Action on Error | Song Count |
|-----------|----------------------|-----------------|------------|
| A | No Drives Or Prime | Rotate Song | 167 |
| B | No Daytime At All | Rotate Song | 41 |
| C | Saturday Only Cruise | Rotate Song | 18 |
| D | Cruising Only | Rotate Song | 42 |
| E | No Weekday Middays | | 2 |

[A] No Drives Or Prime

| Day | 12 | 1a | 2a | 3a | 4a | 5a | 6a | 7a | 8a | 9a | 10 | 11 | 12 | 1p | 2p | 3p | 4p | 5p | 6p | 7p | 8p | 9p | 10 | 11 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mon | | | | | | | X | X | X | | | | X | | | | X | X | | | | | | |
| Tue | | | | | | | X | X | X | | | | X | | | | X | X | | | | | | |
| Wed | | | | | | | X | X | X | | | | X | | | | X | X | | | | | | |
| Thu | | | | | | | X | X | X | | | | X | | | | X | X | | | | | | |
| Fri | | | | | | | X | X | X | | | | X | | | | X | X | | | | | | |
| Sat | | | | | | | | | | | | X | X | X | | | | | | | | | | |
| Sun | | | | | | | | | | | | | X | X | | | | | | | | | | |

X = NOT allowed in these hours... [Left-Click]=Prohibit [Right-Click]=Allow

 **Natural Broadcast Systems**
 Reliable, High Quality Broadcast Management Software
 At Prices That Make Sense!



Automated Social PartyStrands

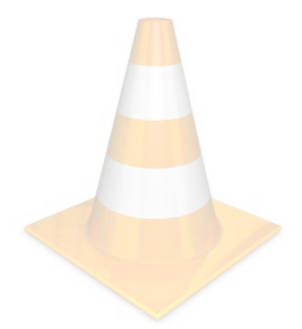
The screenshot shows a web browser window titled "partyStrands". The main content area features a music player interface with a dark background and blue dot patterns. At the top left, a play button icon is followed by the text "now playing". The song title "Boulevard Of Broken Dreams" is displayed in large white font, with "by Green Day" in yellow below it. In the center, there is a square album cover for Green Day's "American Idiot", showing a hand holding a red heart. To the right, the PartyStrands logo is above the text "SMS TO 81890" in large yellow font, with "50c + std txt rate" in smaller white text below it. At the bottom, the text "Brought to you by:" is followed by three user avatars and names: "FatDan" (with a small image of a person), "olviacakes3" (with a small icon of a hand holding a heart), and "aldamiz" (with a small cartoon character icon).

Social



Manual

Automated



Non-Social

art of the mix



- Hand made playlists
- Mix art
- Web services
- Pre-crawled data at:

<http://labrosa.ee.columbia.edu/projects/musicsim/aotm.html>

ART OF THE MIX



Welcome to the website dedicated to making mixed tapes and cds. **Search the archives** of over 100,000 mixes or check out **recent submissions**. Submit a **mixed tape** or **playlist** yourself. Check out the **exhibits, forums** and **blog**. For more information about the site, review the **Frequently Asked Questions**.

FIQL Playlists Charts Create Forum

Search Playlists Search

New Playlists Browse by Type RSS Feeds

- I Was Made For Sunny Days**
Happy / Uptempo
By nikkic89
- Hollister Co. Back To School 20...**
Happy / Uptempo • Other
By anonymous
- Wakeup Mood iii**
Alternative • Energetic • Indie • Other
By CubanMan
- Sf Marathon Mix**
Energetic • Other
By RunLikeM4d

- Browse / search for playlists
- Create a playlist:
 - Search for artist / songs
 - Add songs to a playlist
 - Re-order the playlist
 - Describe the playlist:
 - title, description, tags
 - Decorate the playlist
 - Publish the playlist

Playlist.com

 playlist.com

The place to discover and listen to free music online, create free playlists, and share it all on your favorite social networks: Facebook, Twitter, Blogger, and more.

Start building a playlist

Today's Top Searches

[eminem](#) [lil wayne](#) [drake](#) [3oh!3](#) [justin bieber](#) [usher](#) [lady gaga](#) [b.o.b](#)
[katy perry](#) [taylor swift](#) [kesha](#) [airplanes](#) [t.i.](#) [nicki minaj](#) [nickelback](#) [trey songz](#)
[linkin park](#) [glee](#) [beyonce](#) [miley cyrus](#)

mixpod

mixpod

My MixPod

My Playlists

Create Playlist

Browse

Community ▾

Create A Music Playlist!

Your music says a lot about you.

Search

Popular Searches:

[Mike Posner](#), [Katy Perry](#), [Taio Cruz](#), [BoB](#), [Jason Derülo](#), [Eminem](#), [Drake](#), [Eminem](#), [Usher](#),
[Travie McCoy](#)

Share your playlist on MySpace, Facebook, Friendster, hi5, Bebo, blogs & more.



Sign Up!

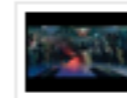
Social Playlists



Funk Music (25 tracks)

1. Play That Funky Music – W ...
 2. Stevie Wonder "SUPER ...
 3. Super Freak By Rick James
 4. Brick – Dazz
 5. Give Up The Funk By Parli ...
- [and 20 more](#)

Popular Songs



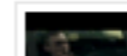
Justin Bieber – Baby Ft. Ludacris

31,068 listeners



Sean Kingston & Justin Bieber "eenie Meenie"

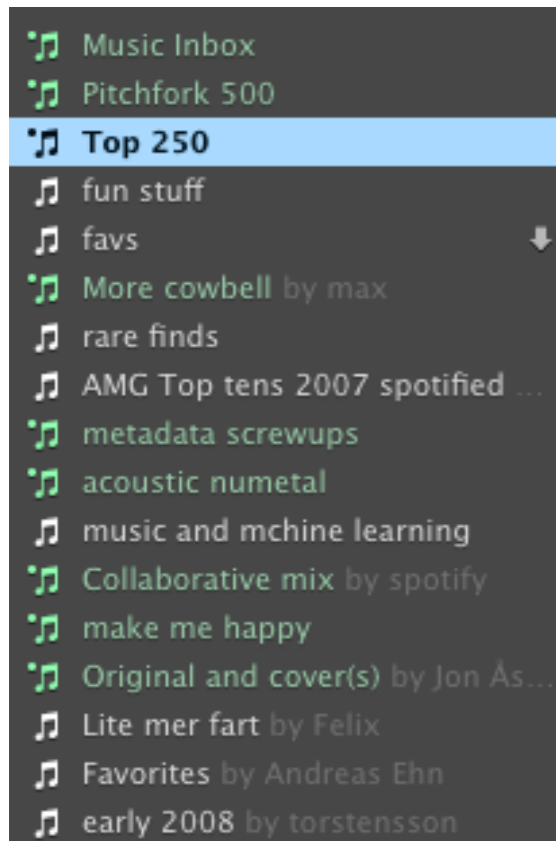
17,540 listeners



Not Afraid By Eminem

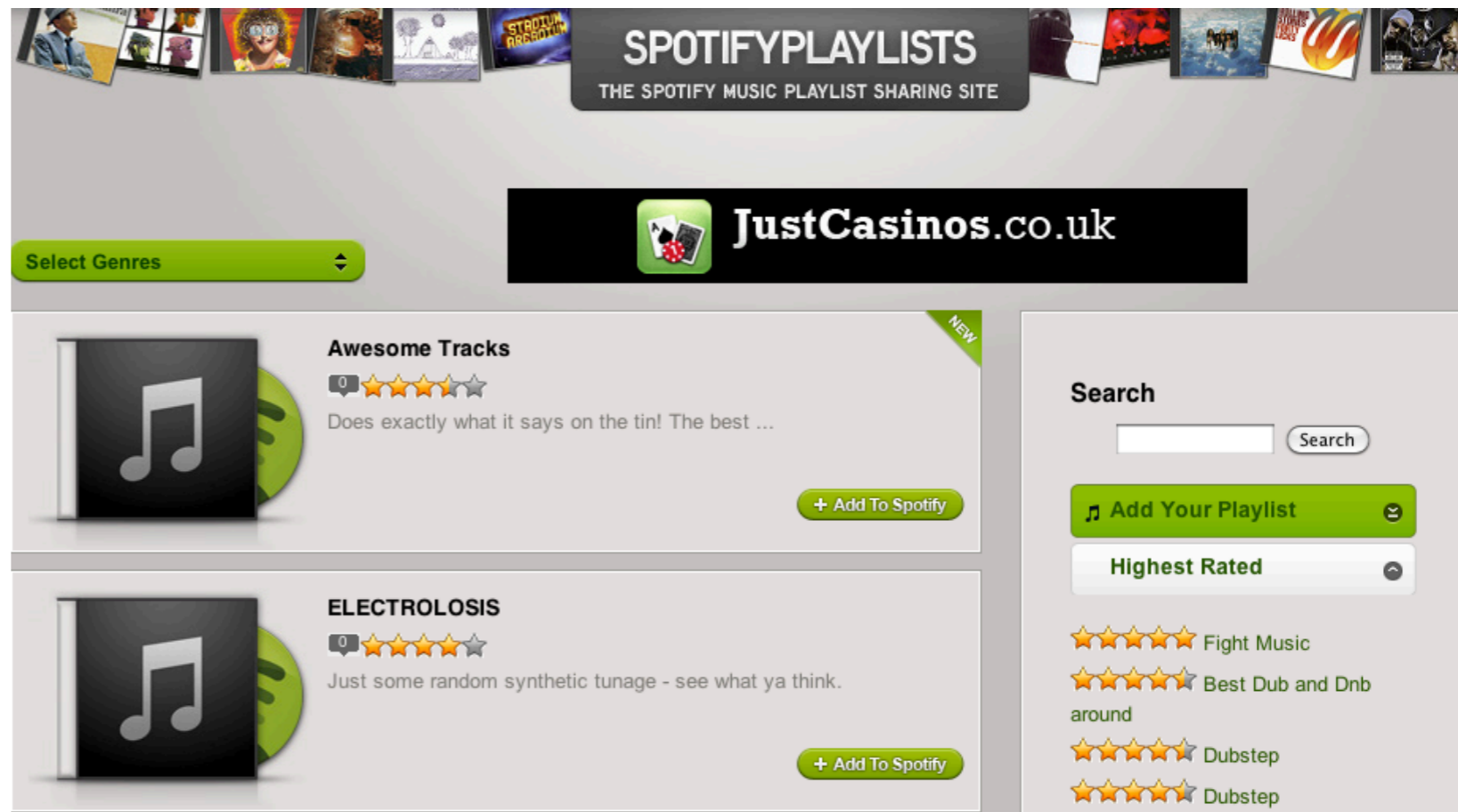
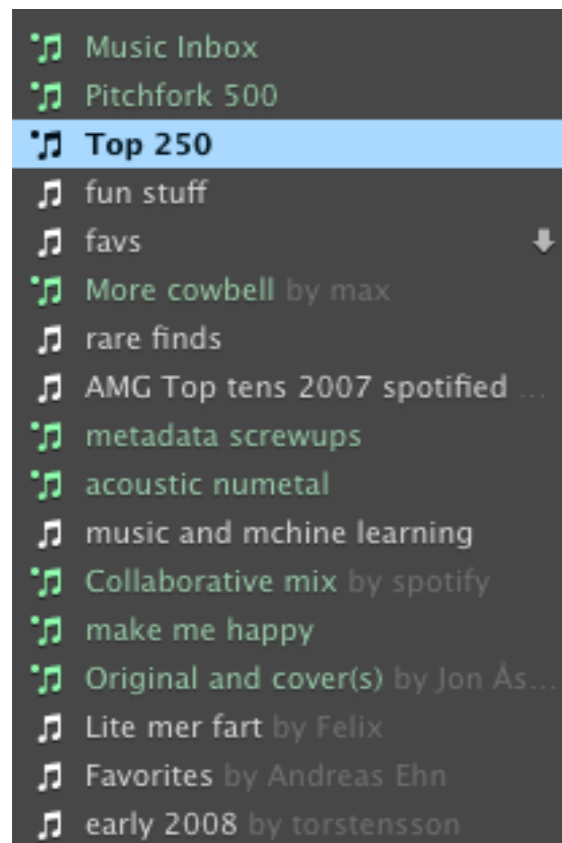
Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites



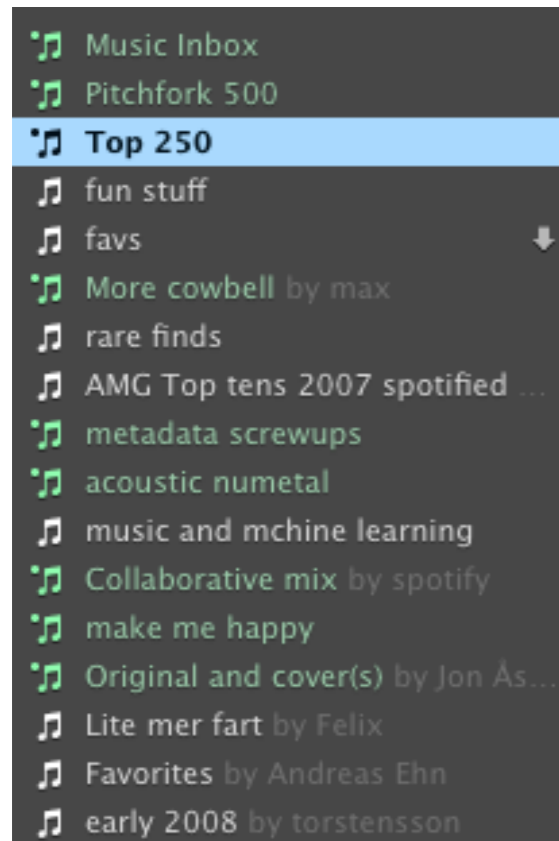
Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites



Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites

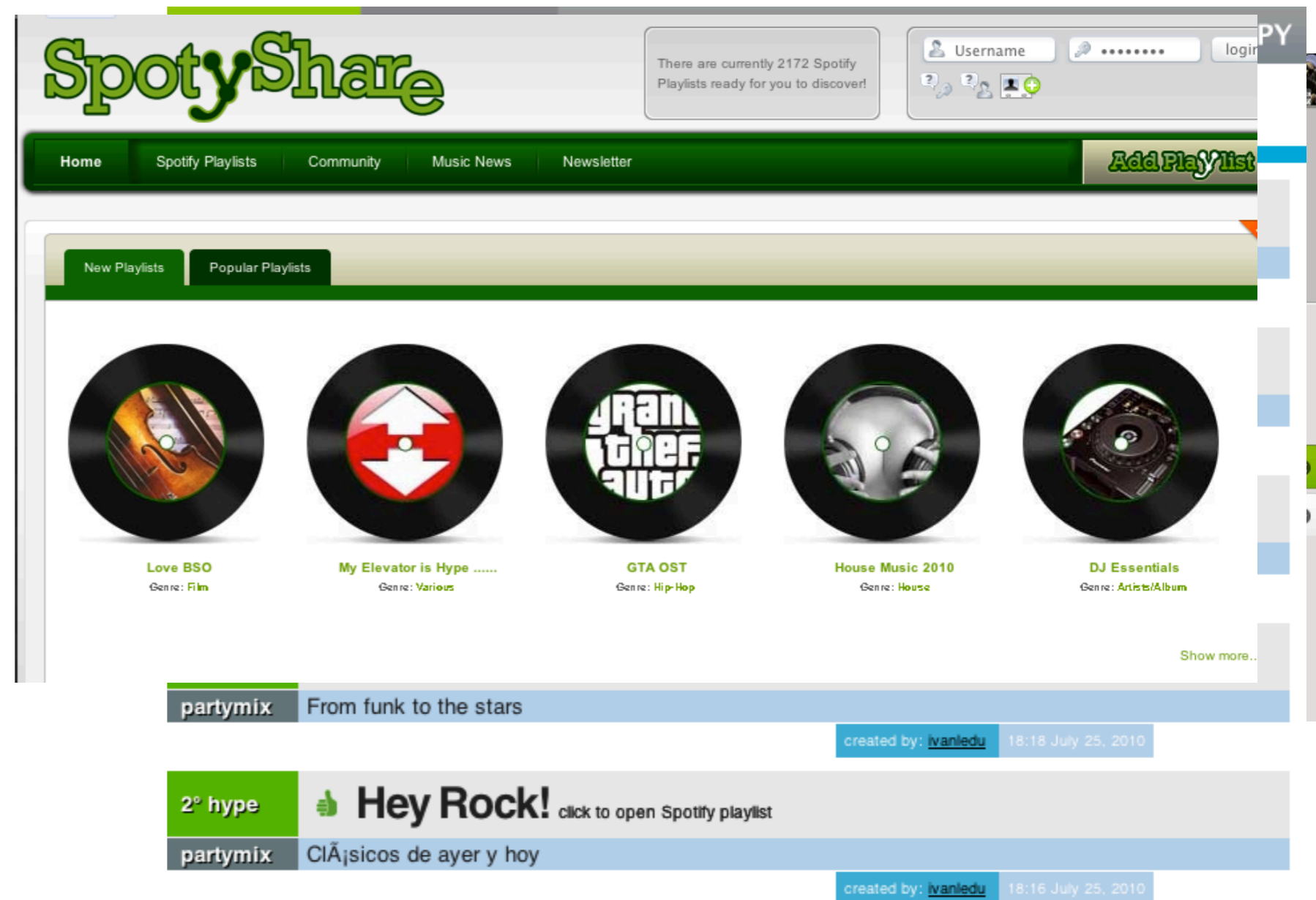
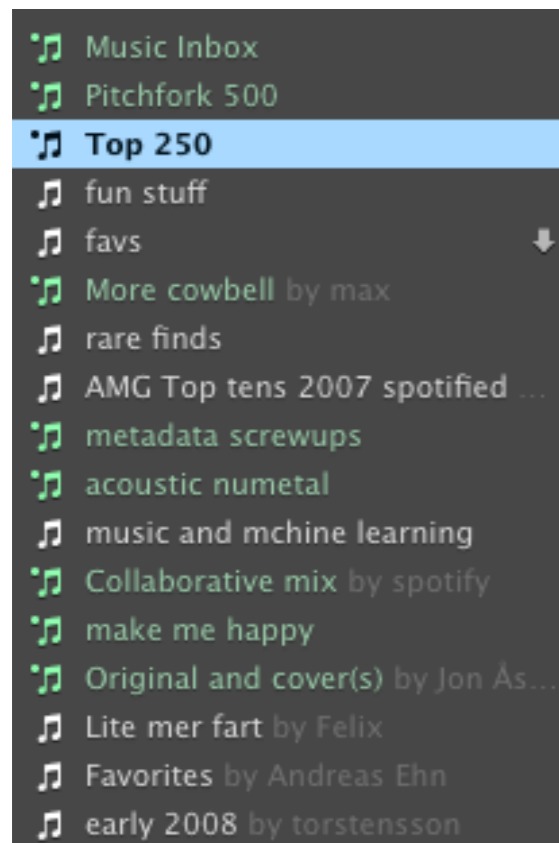


A screenshot of the Spotylists website interface. The top navigation bar includes 'SPOTYLIST' (highlighted in green), 'SUBMIT', 'CHILL', 'MIXES', 'PARTY', and 'HAPPY'. Below the navigation bar, there are tabs for 'spotylists LATEST' and 'sort by POPULARITY'. The main content area displays a list of playlists:

- 4° hype** **AWSUMMER twentyten** [click to open Spotify playlist](#)
happymix Awesome summer playlist!
created by: [mikalsen10](#) 09:18 July 26, 2010
- 2° hype** **2010 songs** [click to open Spotify playlist](#)
mixmix hell yeah ;)
created by: [mmaria-i](#) 00:32 July 26, 2010
- 2° hype** **CHILLLLL** [click to open Spotify playlist](#)
chillmix softa :)
created by: [mmaria-i](#) 00:32 July 26, 2010
- 2° hype** **Hey Groove!** [click to open Spotify playlist](#)
partymix From funk to the stars
created by: [ivanledu](#) 18:18 July 25, 2010
- 2° hype** **Hey Rock!** [click to open Spotify playlist](#)
partymix Clásicos de ayer y hoy
created by: [ivanledu](#) 18:16 July 25, 2010

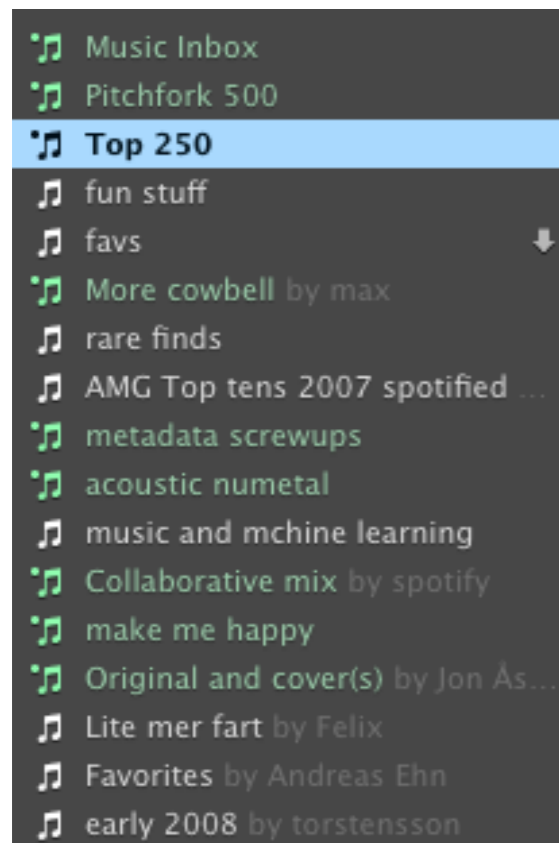
Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites



Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites



A screenshot of the 'Your Spotify' website. The header features the logo 'Your Spotify share your taste' and navigation links for 'Share Your Playlists' and 'Hot Spotify Playlists weekly'. The main content area displays four red square playlist cards, each with the word 'Compañeros' in white cursive and a green 'Play now' button. Below each card is the playlist title, a brief description, the creator's name 'by Compañeros.se', the publication date, the number of comments, a star rating, and social sharing icons for Facebook and Twitter. The playlists are: 'Compañeros April -10' (Iron Maiden – Out Of ...), 'Compañeros Mars 2010' (Ännu en eminent spellista av ...), 'Compañeros Feb 2010' (Kontorsmusik på Compañeros februari. www.companeros.se Buddy Guy ...), and 'Compañeros Jan 2010' (Det som fyller högtalarna på ...). At the bottom, there is a footer with 'partymix' and 'Clásicos de ayer y hoy' on the left, and 'created by: ivanledu 18:16 July 25, 2010' on the right.

Spotify

- Sharable playlists
- Collaborative playlists
- Many 3rd party playlist sites



ShareMyPlaylists.com
Share Spotify playlists with the world and discover new music

Search Playlists...

Playlist Title ▾ ▶

Home

Blog

Members

Groups

User Blogs

Submit Your Playlists ▼

★ Featured Playlists



Polydor Records - What we're listening to August 2010



Overrating The Underrated's July Snapshot



Phill and Phil Episode 2



The Soundtrack to July 2010



Strictly Drum & Bass... Part Eleven

There are currently 23,659 Spotify Playlists ready for you to discover!

Mix Enablers

mixcloud

Home | Mixcloud - Re-think x

http://www.mixcloud.com/

mixcloud popular categories about upload join login Search

Celebration of Curation

Exclusive Vice Cloudcast [Click here](#)

Listen to top radio presenters and DJs. Start [here](#)

Hot Popular New All Activity Friends

DJ Shadow live at Benicàssim by Red Bull Music Academy...
Trip Hop / Instrumental H... / Abstract Hip Hop / Beats / Hip Hop
Uploaded 2 days, 18 hours ago ▶1,404 ♥61 💬2

Sunday Kind of Fool by Orsii
Jazz
Uploaded 4 days, 23 hours ago ▶812 ♥29 💬10

DJs In PJs Part 3 #djsinpjs by Trust in Dust Radio
Disco / Hiphop / Soul / Reggae / Djsinpjs
Uploaded 5 days, 23 hours ago ▶486 ♥29 💬11

Jose Padilla-Bella Musica-Ibiza So... by Ibiza Sonica
Balearic / Afro-Latin / Funk - Soul -... / House Music / Ibiza Sonica
Uploaded 1 day ago ▶741 ♥12 💬1

Thank You DILLA Vol.3 by Vlada Stojanovic
Funk / Soul / Jazz / Breaks / J Dilla
Uploaded 3 days, 23 hours ago ▶294 ♥16 💬3

Melodica 26 July 2010 by Chris Coco
Radio / Electronica / House / Balearic / Eclectic
Uploaded 4 days, 6 hours ago ▶513 ♥5 💬2

Slam - Classics mix @ ATLANTIS by slam

Featured Categories

- Indie
- Fluid Radio
- Jazz / Ambient
- Comedy
- Hip Hop
- Business

Sponsored Link

feedback Ads

Mix Enablers








mixcloud

- Free social networking platform organized around the exchange of long form audio, principally [dance] music
- Provides a means for DJs (aspiring and professional) to connect with the audience and into the Web of Things

Mix Enablers

mixlr

The screenshot shows a web browser window with the URL <http://mixlr.com/newsfeed>. The page header includes the text "Hello, **alsothings**.", "Edit profile", and "Sign out". The main content area features the Mixlr logo and the heading "What's Happening Now?". Below this, there are two tabs: "Everybody" and "People I Follow". The newsfeed displays a list of recent events:

-  **Guitarotherapy** started **following ardentronic** about 1 hour ago
-  **Hectic** uploaded a set **Hectic Dubstep Mini-Mix July 2010** about 2 hours ago
-  **Hectic** joined Mixlr about 2 hours ago
-  **thornkvist** joined Mixlr about 3 hours ago
-  **electricsponge** joined Mixlr about 3 hours ago
-  **Zurkik** joined Mixlr about 4 hours ago
-  **alexia** uploaded a set **Alexia TheLabelRadioShow Deep Tek House** about 6 hours ago

The browser's download bar at the bottom shows a file named "mixlr-osx-latest.zip" and a link to "Show all downloads...".

Mix Enablers

mixlr

- Focused on adding social features to centralized multicasting
- Supports live and recorded (mixed and unmixed) streams
- Social connectivity is web-based, broadcaster is a native application
- Native app provides integration with common DJ tools



setlist.fm

A wiki for
concert setlists

Emerson, Lake & Palmer Concert at Victoria Park, London,
England Setlist on July 25, 2010



Artist

[Emerson, Lake & Palmer](#)

[Artist statistics](#)

[Add setlist](#)

Venue

[Victoria Park, London, England](#)

Attendees

[aeolist](#) [cafcchegs](#) [Steban14](#)

Last edited

July 31, 2010 2:04:17 PM UTC by [Blackadder](#)



SHARE

1. *Karn Evil 9: 1st Impression, Part 2*
2. *The Barbarian*
3. *Bitches Crystal*
4. *Touch and Go*
5. *Knife-Edge*
6. *From The Beginning*
7. *Take a Pebble*
8. *Tarkus*
9. *Farewell to Arms*
10. *Lucky Man*
11. *Pictures at an Exhibition*
12. *Fanfare for the Common Man/Drum Solo/Rondo*

setlist.fm

Emerson, Lake & Palmer Concert at Victoria Park, London, England Setlist on July 25, 2010



Artist

[Emerson, Lake & Palmer](#)

[Artist statistics](#)

[Add setlist](#)

Venue

[Victoria Park, London, England](#)

Attendees

[aeolist](#) [cafcchegs](#) [Steban14](#)

Last edited

July 31, 2010 2:04:17 PM UTC by [Blackadder](#)



SHARE

1. *Karn Evil 9: 1st Impression, Part 2*
2. *The Barbarian*
3. *Bitches Crystal*
4. *Touch and Go*
5. *Knife-Edge*
6. *From The Beginning*
7. *Take a Pebble*
8. *Tarkus*
9. *Farewell to Arms*
10. *Lucky Man*
11. *Pictures at an Exhibition*
12. *Fanfare for the Common Man/Drum Solo/Rondo*

A wiki for
concert setlists

They have an
API!

REST Endpoints

[/0.1/artist/{mbid}](#)
[/0.1/city/{geoid}](#)
[/0.1/search/artists](#)
[/0.1/search/cities](#)
[/0.1/search/countries](#)
[/0.1/search/setlists](#)
[/0.1/search/venues](#)
[/0.1/setlist/{setlistId}](#)
[/0.1/venue/{venueId}](#)
[/0.1/artist/{mbid}/setlists](#)
[/0.1/setlist/lastFm/{lastFmEventId}](#)
[/0.1/setlist/version/{versionId}](#)
[/0.1/venue/{venueId}/setlists](#)
[/0.1/artist/{mbid}/tour/{tour}](#)

The playlisting dead pool

The screenshot shows the musicmobs website interface. At the top left is a search bar with the text "SEARCH ARTIST" and a "GO" button. The "musicmobs" logo is prominently displayed in the center. Below the logo, there are sections for "Popular Playlist Tags" and "Recent Updates".

Popular Playlist Tags: bass, bestof catharsis checkout chillout chill-out, **dance** dark dj-shadow,narcosis, drum-n-bass, electro electronic, electronica, faith fast god **halloween** hip-hop hip-hop, house idm, **indie** instrumental, instrumental-hip-hop, laid-back, **melancholy** miscommunication mix mood mowax, neo-psychedelic nocturnal **religion** sad

New Playlists:

- Bought On-line**
created by: manfred - 1 fans - 0 comments
- name-drop**
created by: indibelief - 1 fans - 0 comments
- Black Kitten Superstition**
created by: thenadjugler - 1 fans - 0 comments
[party rock](#) [dance](#) [nocturnal](#) [scary](#)
- Squarepusher**
created by: demerit13 - 1 fans - 0 comments
[electronica](#), [slap-bass](#), [warp](#), [drum-n-bass](#), [fast](#)

Top Playlists This Month:

- delicious poison**
created by: rocketsurgeon - 3 recent fans - 1 comment
[neo-psychedelic](#) [checkout](#) [upbeat](#) [indie](#)
- A little something spooky**
created by: p0iesquac100 - 2 recent fans - 0 comments
[halloween](#) [dark](#) [spooky](#) [mix](#)
- Electronic**
created by: rootsandrespect - 1 recent fans - 0 comments
- name-drop**
created by: indibelief - 1 recent fans - 0 comments

WebJay PLAYLIST COMMUNITY

Navigation buttons: Browse, Create, Discuss, Import, Search, Help

PLAY PAGE

iTunes [player troubleshooting ?](#)

- ▶ [Love taken over \(again\): download](#) [site download](#)
- ▶ [Contemplatin' \(Hanqin' on a string\): download](#) [site download](#)
- ▶ [Play That Shit \(Police Mashup\): download](#) [site download](#)
- ▶ [Smooth Scratch: download](#) [site download](#)
- ▶ [Hard Work \(George W Bush\): download](#) [site download](#)
- ▶ [Japanese Rock 'n Roll \(Prodikeys\): download](#) [site download](#)

research systems

Human-Facilitating Systems

Personal Radio

- An early collaborative filtering system
- Users rated songs directly
- Playlists are built by finding similar (via Pearson's correlation coefficient) users
- Playlists can, once built, be streamed, named, shared and **modified**
- Order is either random or user defined

| cdhayes : mellow and jazzy | | |
|----------------------------|-----------------|----------------|
| Track | Artist | Rate this item |
| Walk On By | Dionne Warwick | 1 2 3 4 ✖ |
| Mood Indigo | Ella Fitzgerald | 1 2 3 4 ✖ |
| Say Hello wave goodbye | David Gray | 1 2 ✖ 4 5 |
| Lilac Wine | Nina Simone | 1 2 3 4 5 |
| Fool for You | Gurtis Mayfield | 1 2 3 ✖ 5 |

Personal Radio

- An early collaborative filtering system
- Users rated songs directly
- Playlists are built by finding similar (via Pearson's correlation coefficient) users
- Playlists can, once built, be streamed, named, shared and **modified**
- Order is either random or user defined



Collaborative Choice

A public voting system



Collaborative Choice

Decentralized supply

The screenshot displays the Jukola website interface. At the top, there is a navigation bar with links: home, playlist, upload music, local music, your opinion, and www.watershed.co.uk. The date is shown as Thursday, September 4, 2003. The main content area is divided into several sections:

- jukola?**: A section explaining that Jukola is a digital jukebox where users can choose music played in the bar. It mentions a large touch screen for nominations and that the system is also on the web. An image shows a hand interacting with the touch screen.
- playlist**: A section titled "last 30 songs played in watershed, updated: 12:45 pm thursday, september 4, 2003". It lists several songs, including "Cheeky song" by Cheeky girls, "Little L" by Jamiroquai, "You are the sunshine..." by Stevie Wonder, "Watch yourself" by Lil' Kim, and "Born in the USA" by Bruce Springsteen. A "More..." link is visible at the end of the list.
- upload music**: A form for users to upload their own music. It includes a "Browse..." button for selecting an MP3 file, and input fields for "Name of song", "Name of artist", and "Name of Album (optional)". There are also optional fields for "Release date of Album", "Information on band (optional) max 50 characters", and "Your email address (optional) we will not pass it on". A "Submit" button is at the bottom right.
- your opinion**: A section for providing feedback, with a text input field and a "Send" button.

Playlist Sharing

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use



Playlist Sharing

1. Members associate music from their personal library to their activities and locations
2. For each new song, the system picks a random user and a song from that user's current state
3. Music is streamed to each mobile device
4. The device displays the current song and which user assigned it



Field Tested:

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use

Field Tested:

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use

"I am a weather guy. Happy music for sunny days so to speak."

Field Tested:

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use

"I am a weather guy. Happy music for sunny days so to speak."

"I made her a CD because I can't stand her music."

Field Tested:

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use

"I am a weather guy. Happy music for sunny days so to speak."

"I made her a CD because I can't stand her music."

Participants report on hearing between 30% - 50% "bad songs".

Field Tested:

- Music should help convey status information and implicit presence
- Music should help build interpersonal relationships
- A good individual listening experience should be supported
- Support smooth continuous use

"I am a weather guy. Happy music for sunny days so to speak."

"I made her a CD because I can't stand her music."

Participants report on hearing between 30% - 50% "bad songs".

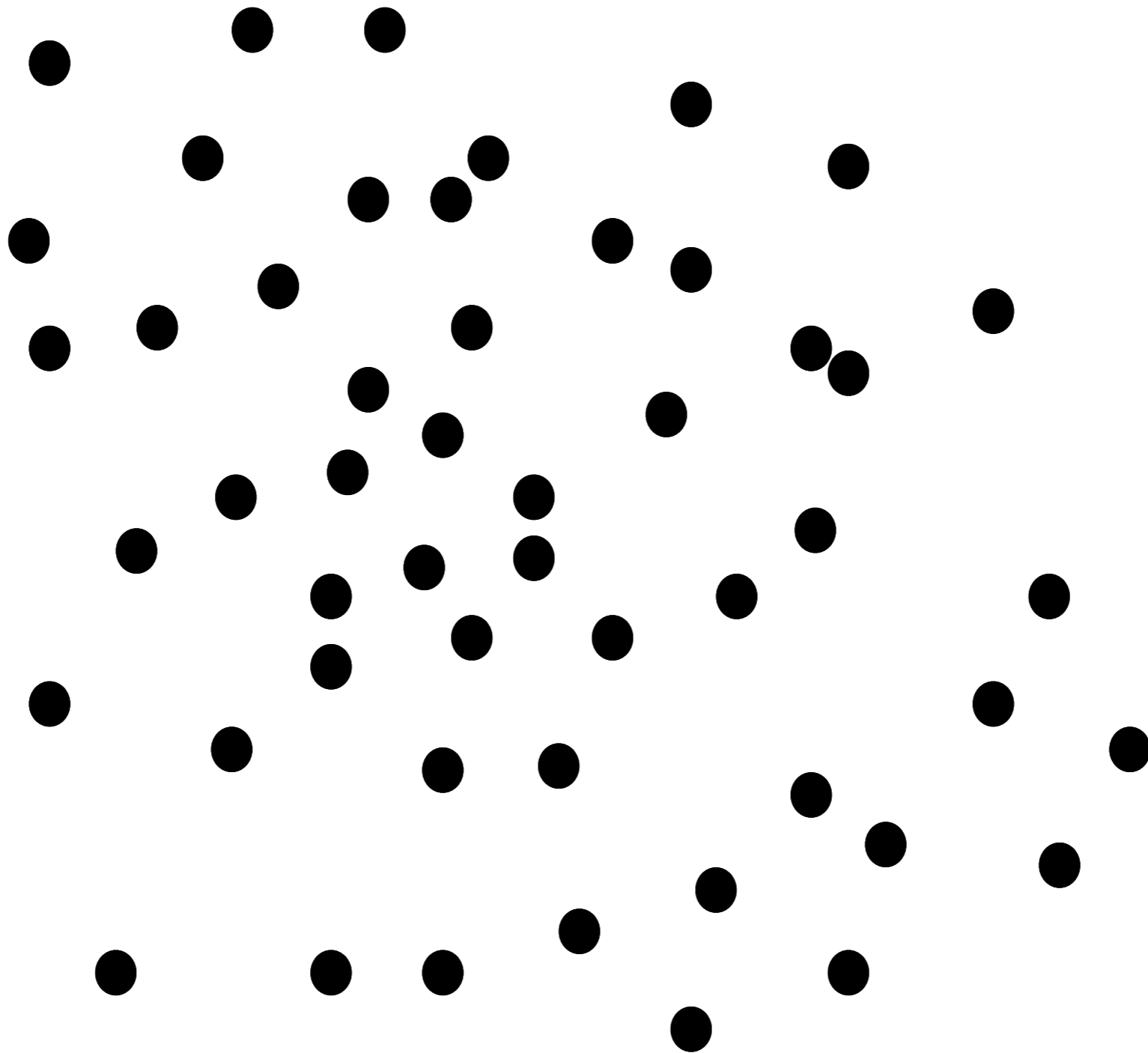
At such occasions, they may turn off the service and switch to their own music library.

Implications

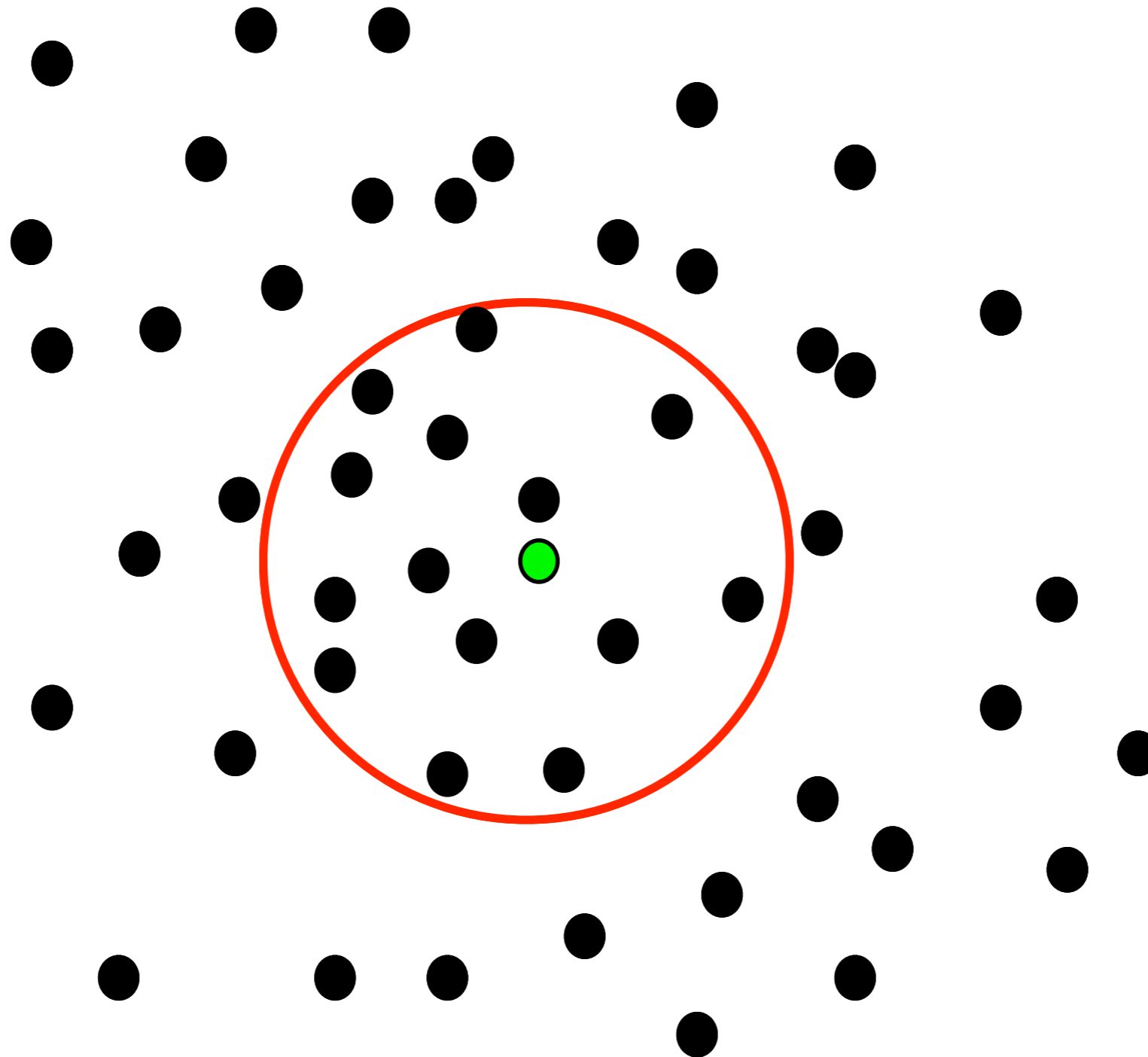
- Smooth integration with individual music listening to encourage continuous use
- Allow flexibility and cues to support self-expression and enable touch points
- Support ongoing relationships
- Counterbalance experiences of bad songs and misinterpretations

Fully Automatic Systems

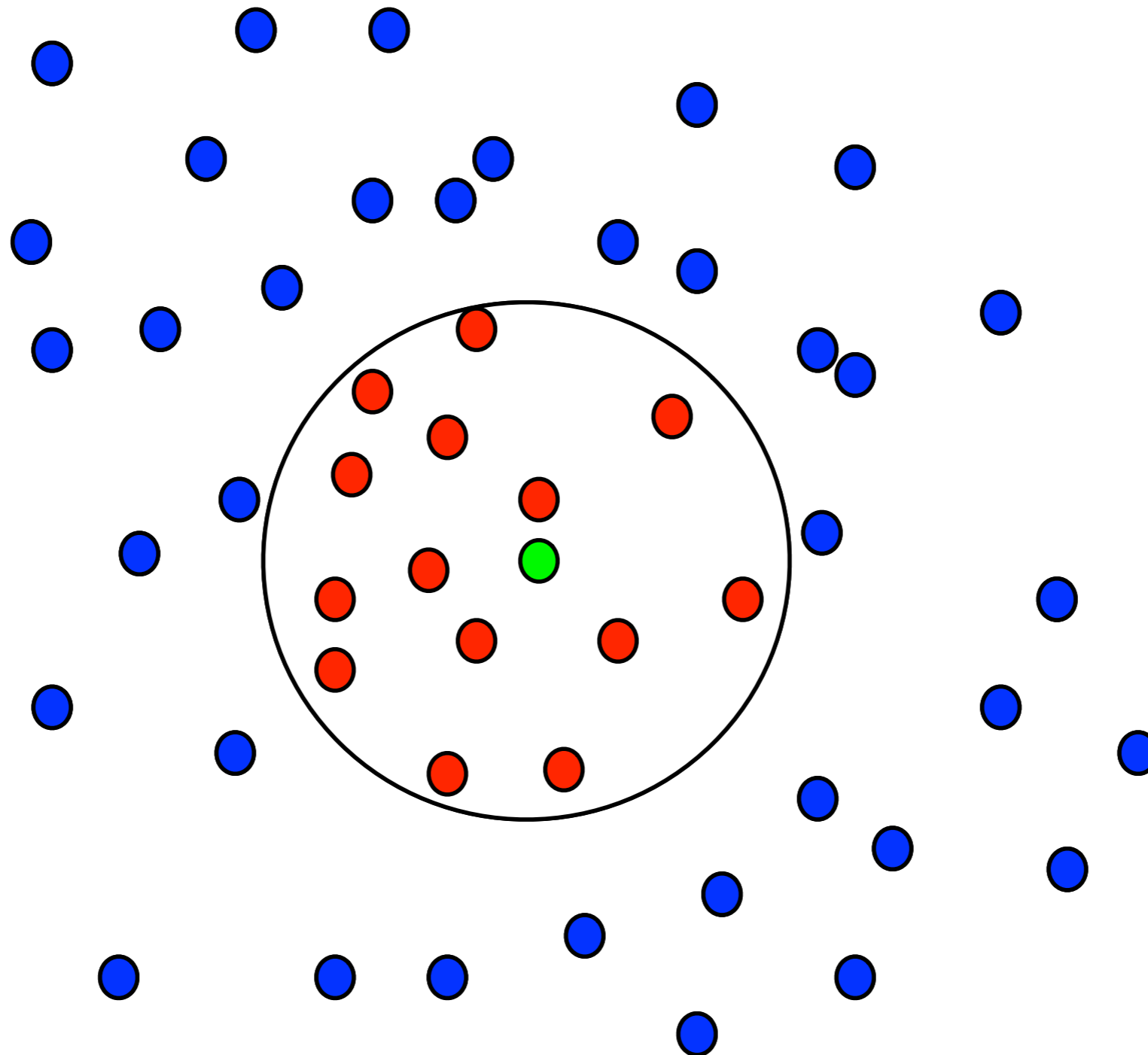
Nearest Neighbors



Nearest Neighbors



Nearest Neighbors



Pure Content

- Uses MFCCs and finds N nearest neighbors
- Forms a graph with all songs weighted by distance
- Playlist is created by finding the shortest weighted path covering N songs

Pure Content

| Relevance | Average nr. of relevant songs in playlist | | |
|-------------|---|---------|---------|
| | Size 5 | Size 10 | Size 20 |
| Same Genre | 3.46 | 6.60 | 12.6 |
| Same Artist | 1.34 | 2.07 | 3.01 |
| Same Album | 1.11 | 1.63 | 2.21 |

| Relevance | Scheme | Average nr. of relevant songs in playlist | | |
|-------------|--------------|---|---------|---------|
| | | Size 5 | Size 10 | Size 20 |
| Same Genre | Trajectory,1 | 3.26 | 6.13 | 10.75 |
| Same Artist | | 1.08 | 1.43 | 1.68 |
| Same Album | | 0.89 | 1.11 | 1.22 |
| Same Genre | Trajectory,2 | 3.33 | 6.37 | 12.08 |
| Same Artist | | 1.23 | 1.89 | 2.73 |
| Same Album | | 1.01 | 1.49 | 2.00 |
| Same Genre | Feedback | 3.40 | 6.54 | 12.46 |
| Same Artist | | 1.27 | 1.96 | 2.83 |
| Same Album | | 1.05 | 1.54 | 2.07 |

Pure Content

| Relevance | Average nr. of relevant songs in playlist | | |
|-------------|---|---------|---------|
| | Size 5 | Size 10 | Size 20 |
| Same Genre | 3.46 | 6.60 | 12.6 |
| Same Artist | 1.34 | 2.07 | 3.01 |
| Same Album | 1.11 | 1.63 | 2.21 |

| Relevance | Scheme | Average nr. of relevant songs in playlist | | |
|-------------|--------------|---|---------|---------|
| | | Size 5 | Size 10 | Size 20 |
| Same Genre | Trajectory,1 | 3.26 | 6.13 | 10.75 |
| Same Artist | | 1.08 | 1.43 | 1.68 |
| Same Album | | 0.89 | 1.11 | 1.22 |
| Same Genre | Trajectory,2 | 3.33 | 6.37 | 12.08 |
| Same Artist | | 1.23 | 1.89 | 2.73 |
| Same Album | | 1.01 | 1.49 | 2.00 |
| Same Genre | Feedback | 3.40 | 6.54 | 12.46 |
| Same Artist | | 1.27 | 1.96 | 2.83 |
| Same Album | | 1.05 | 1.54 | 2.07 |

Pure Content

| Relevance | Average nr. of relevant songs in playlist | | |
|-------------|---|---------|---------|
| | Size 5 | Size 10 | Size 20 |
| Same Genre | 3.46 | 6.60 | 12.6 |
| Same Artist | 1.34 | 2.07 | 3.01 |
| Same Album | 1.11 | 1.63 | 2.21 |

| Relevance | Scheme | Average nr. of relevant songs in playlist | | |
|-------------|--------------|---|---------|---------|
| | | Size 5 | Size 10 | Size 20 |
| Same Genre | Trajectory,1 | 3.26 | 6.13 | 10.75 |
| Same Artist | | 1.08 | 1.43 | 1.68 |
| Same Album | | 0.89 | 1.11 | 1.22 |
| Same Genre | Trajectory,2 | 3.33 | 6.37 | 12.08 |
| Same Artist | | 1.23 | 1.89 | 2.73 |
| Same Album | | 1.01 | 1.49 | 2.00 |
| Same Genre | Feedback | 3.40 | 6.54 | 12.46 |
| Same Artist | | 1.27 | 1.96 | 2.83 |
| Same Album | | 1.05 | 1.54 | 2.07 |

Metadata Models

| Metadata Field | Example Values | Number of Values |
|--------------------|---|------------------|
| Genre | Jazz, Reggae, Hip-Hop | 30 |
| Subgenre | Heavy Metal, I'm So Sad and Spaced Out | 572 |
| Style | East Coast Rap, Gangsta Rap, West Coast Rap | 890 |
| Mood | Dreamy, Fun, Angry | 21 |
| Rhythm Type | Straight, Swing, Disco | 10 |
| Rhythm Description | Frenetic, Funky, Lazy | 13 |
| Vocal Code | Instrumental, Male, Female, Duet | 6 |

Metadata Models

| Metadata Field | Example Values | Number of Values |
|--------------------|---|------------------|
| Genre | Jazz, Reggae, Hip-Hop | 30 |
| Subgenre | Heavy Metal, I'm So Sad and Spaced Out | 572 |
| Style | East Coast Rap, Gangsta Rap, West Coast Rap | 890 |
| Mood | Dreamy, Fun, Angry | 21 |
| Rhythm Type | Straight, Swing, Disco | 10 |
| Rhythm Description | Frenetic, Funky, Lazy | 13 |
| Vocal Code | Instrumental, Male, Female, Duet | 6 |

- Use Gaussian Process Regression to create playlists based on seed tracks

Metadata Models

| Metadata Field | Example Values | Number of Values |
|--------------------|---|------------------|
| Genre | Jazz, Reggae, Hip-Hop | 30 |
| Subgenre | Heavy Metal, I'm So Sad and Spaced Out | 572 |
| Style | East Coast Rap, Gangsta Rap, West Coast Rap | 890 |
| Mood | Dreamy, Fun, Angry | 21 |
| Rhythm Type | Straight, Swing, Disco | 10 |
| Rhythm Description | Frenetic, Funky, Lazy | 13 |
| Vocal Code | Instrumental, Male, Female, Duet | 6 |

- Use Gaussian Process Regression to create playlists based on seed tracks
- Using Kernel Meta-Training algorithm on albums to select the priors

Metadata Models

| | Playlist 1 | Playlist 2 |
|------|----------------------------------|---|
| Seed | Eagles, The Sad Cafe | Eagles, Life in the Fast Lane |
| 1 | Genesis, More Fool Me | Eagles, Victim of Love |
| 2 | Bee Gees, Rest Your Love On Me | Rolling Stones, Ruby Tuesday |
| 3 | Chicago, If You Leave Me Now | Led Zeppelin, Communication Breakdown |
| 4 | Eagles, After The Thrill Is Gone | Creedence Clearwater, Sweet Hitch-hiker |
| 5 | Cat Stevens, Wild World | Beatles, Revolution |

- Use Gaussian Process Regression to create playlists based on seed tracks
- Using Kernel Meta-Training algorithm on albums to select the priors
- Playlists are formed based on the maximum log likelihood from the selected seed song

Metadata Models

| Playlist Method | Number of Seed Songs | | | | | | | | |
|------------------|----------------------|-------------|-------------|------|-------------|-------------|-------------|-------------|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| KMT + GPR | 42.9 | 46.0 | 44.8 | 43.8 | 46.8 | 45.0 | 44.2 | 44.4 | 44.8 |
| Hamming + GPR | 32.7 | 39.2 | 39.8 | 39.6 | 41.3 | 40.0 | 39.5 | 38.4 | 39.8 |
| Hamming + No GPR | 32.7 | 39.0 | 39.6 | 40.2 | 42.6 | 41.4 | 41.5 | 41.7 | 43.2 |
| Random Order | 6.3 | 6.6 | 6.5 | 6.2 | 6.5 | 6.6 | 6.2 | 6.1 | 6.8 |

- Use Gaussian Process Regression to create playlists based on seed tracks
- Using Kernel Meta-Training algorithm on albums to select the priors
- Playlists are formed based on the maximum log likelihood from the selected seed song

Metadata Models

| Playlist Method | Number of Seed Songs | | | | | | | | |
|------------------|----------------------|-------------|-------------|------|-------------|-------------|-------------|-------------|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| KMT + GPR | 42.9 | 46.0 | 44.8 | 43.8 | 46.8 | 45.0 | 44.2 | 44.4 | 44.8 |
| Hamming + GPR | 32.7 | 39.2 | 39.8 | 39.6 | 41.3 | 40.0 | 39.5 | 38.4 | 39.8 |
| Hamming + No GPR | 32.7 | 39.0 | 39.6 | 40.2 | 42.6 | 41.4 | 41.5 | 41.7 | 43.2 |
| Random Order | 6.3 | 6.6 | 6.5 | 6.2 | 6.5 | 6.6 | 6.2 | 6.1 | 6.8 |

- Use Gaussian Process Regression to create playlists based on seed tracks
- Using Kernel Meta-Training algorithm on albums to select the priors
- Playlists are formed based on the maximum log likelihood from the selected seed song

Metadata Models

| Playlist Method | Number of Seed Songs | | | | | | | | |
|------------------|----------------------|-------------|-------------|------|-------------|-------------|-------------|-------------|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| KMT + GPR | 42.9 | 46.0 | 44.8 | 43.8 | 46.8 | 45.0 | 44.2 | 44.4 | 44.8 |
| Hamming + GPR | 32.7 | 39.2 | 39.8 | 39.6 | 41.3 | 40.0 | 39.5 | 38.4 | 39.8 |
| Hamming + No GPR | 32.7 | 39.0 | 39.6 | 40.2 | 42.6 | 41.4 | 41.5 | 41.7 | 43.2 |
| Random Order | 6.3 | 6.6 | 6.5 | 6.2 | 6.5 | 6.6 | 6.2 | 6.1 | 6.8 |

- Use Gaussian Process Regression to create playlists based on seed tracks
- Using Kernel Meta-Training algorithm on albums to select the priors
- Playlists are formed based on the maximum log likelihood from the selected seed song

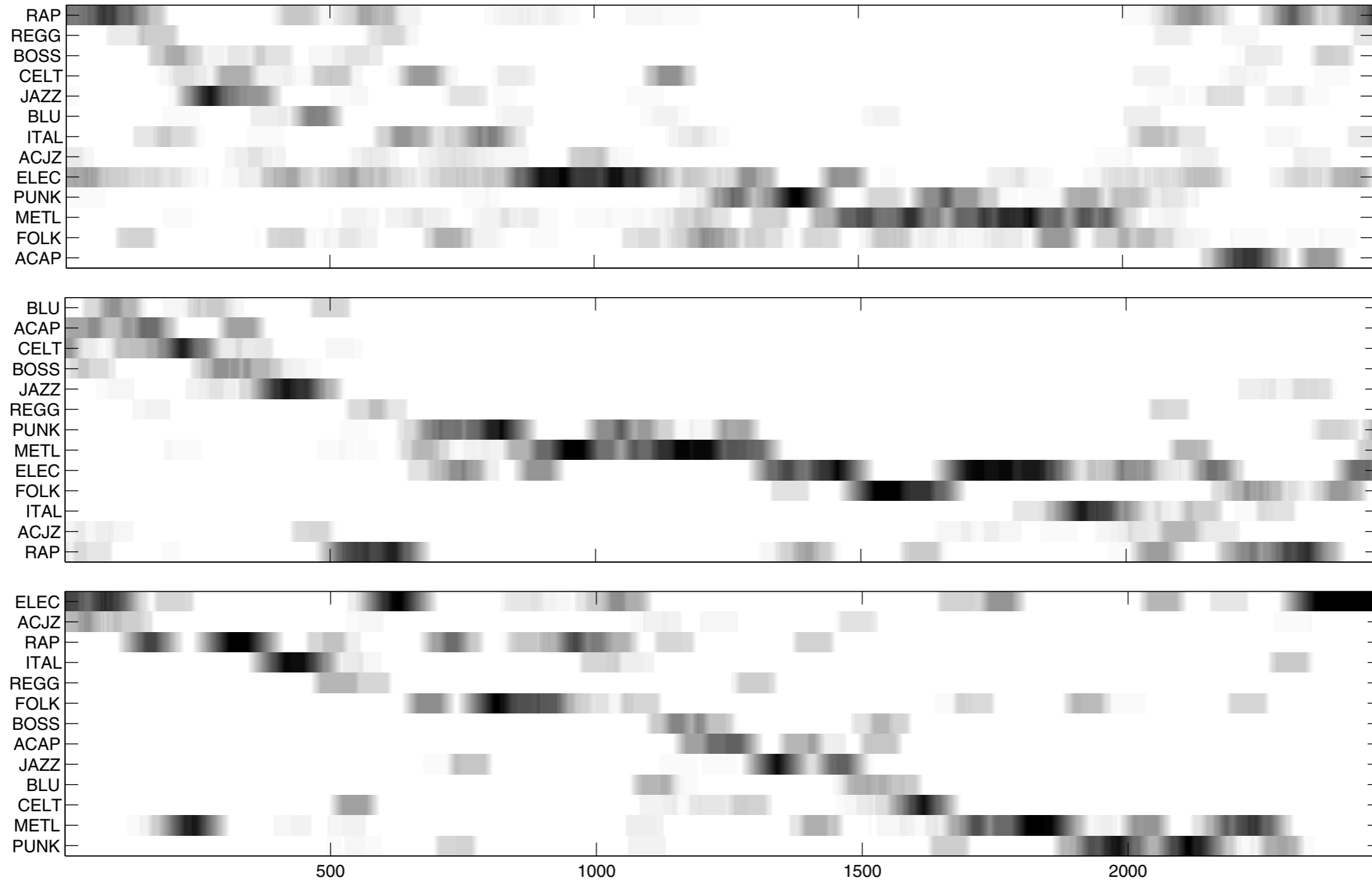
Traveling Sales Playlist?



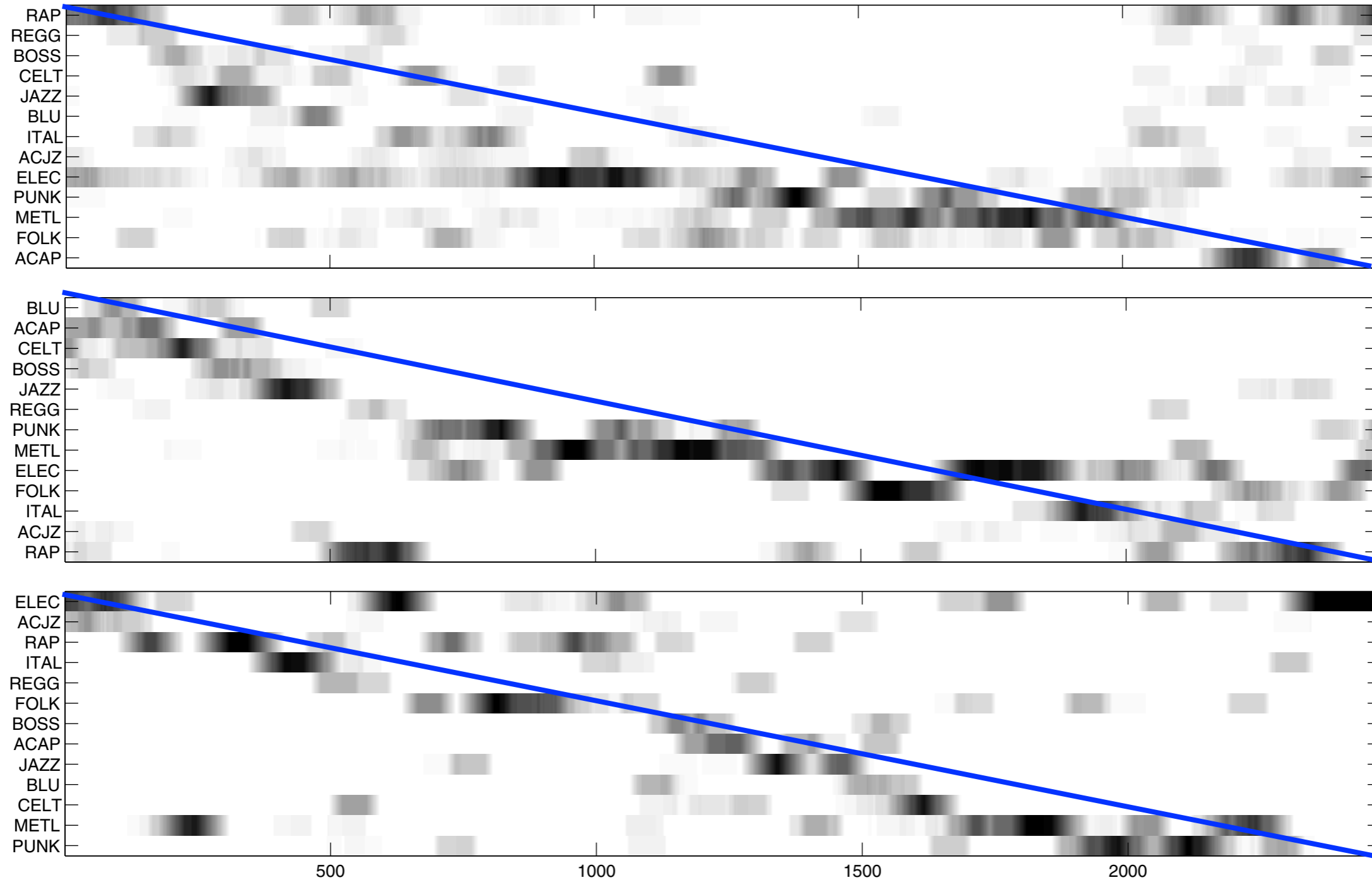
Traveling Sales Playlist?

- Using a combination of content-based song and web-based artist similarity to generate a distance matrix
- Approximation of TSP is used to find ‘tours’ through the collection
- Tested on two collections of about 3000 tracks

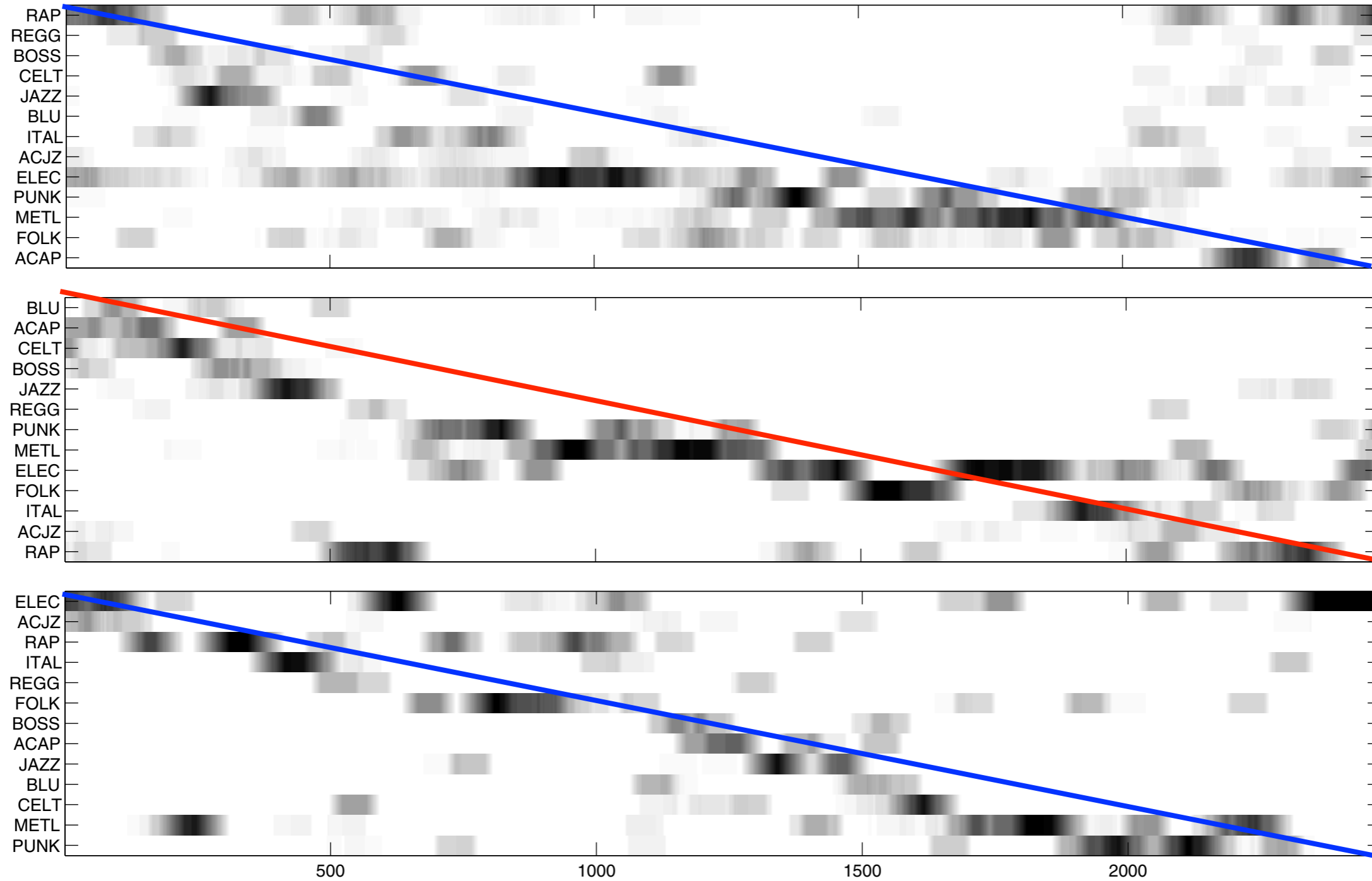
Now With Web Data



Now With Web Data



Now With Web Data



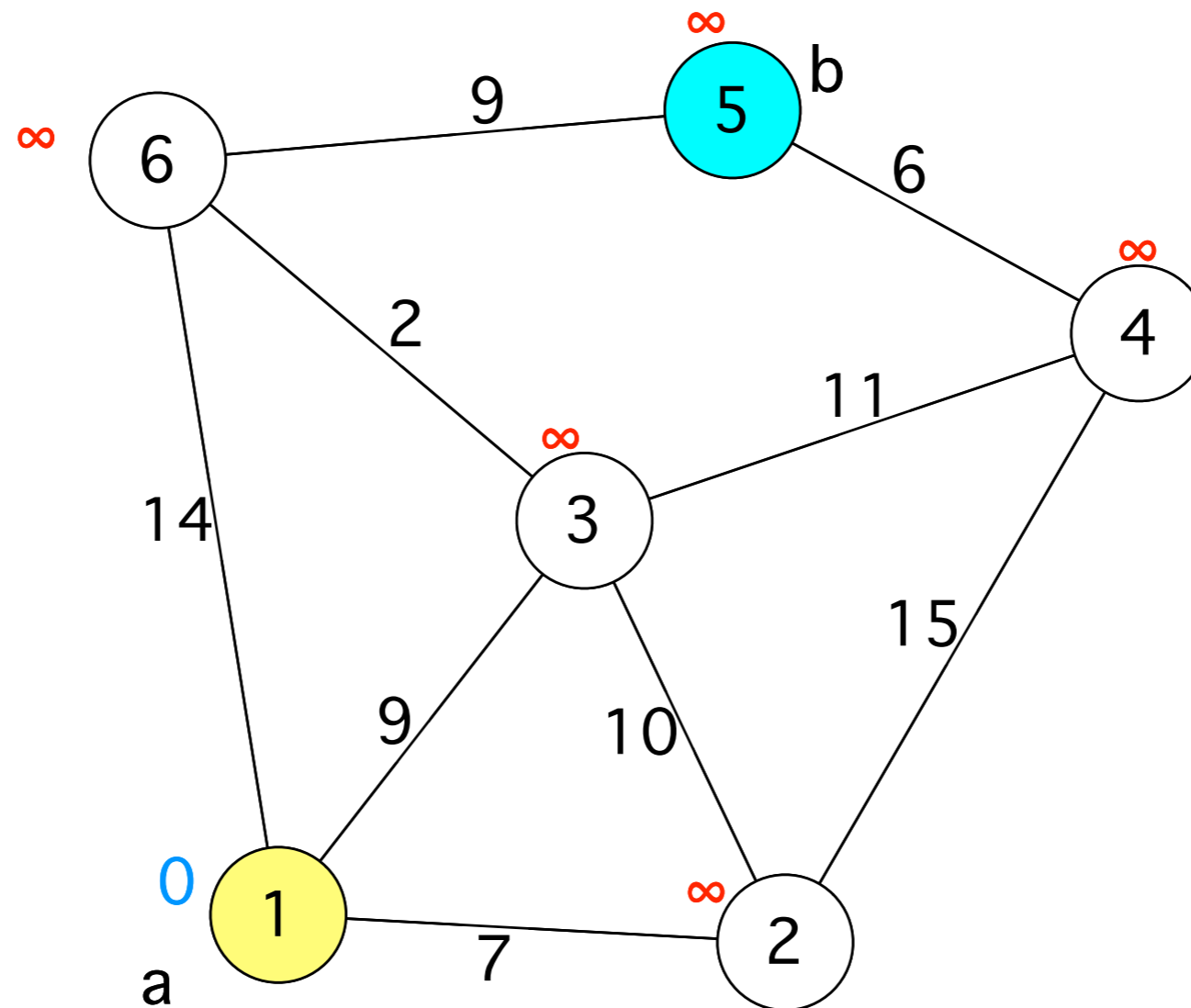
Graph Methods

Dijkstra's algorithm

1. Assign to every node a distance value. Set it to zero for our initial node and to infinity for all other nodes.
2. Mark all nodes as unvisited. Set initial node as current.
3. For current node, consider all its unvisited neighbors and calculate their tentative distance (from the initial node).
4. When we are done considering all neighbors of the current node, mark it as visited. A visited node will not be checked ever again; its distance recorded now is final and minimal.
5. If all nodes have been visited, finish. Otherwise, set the unvisited node with the smallest distance (from the initial node) as the next "current node" and continue from step 3.

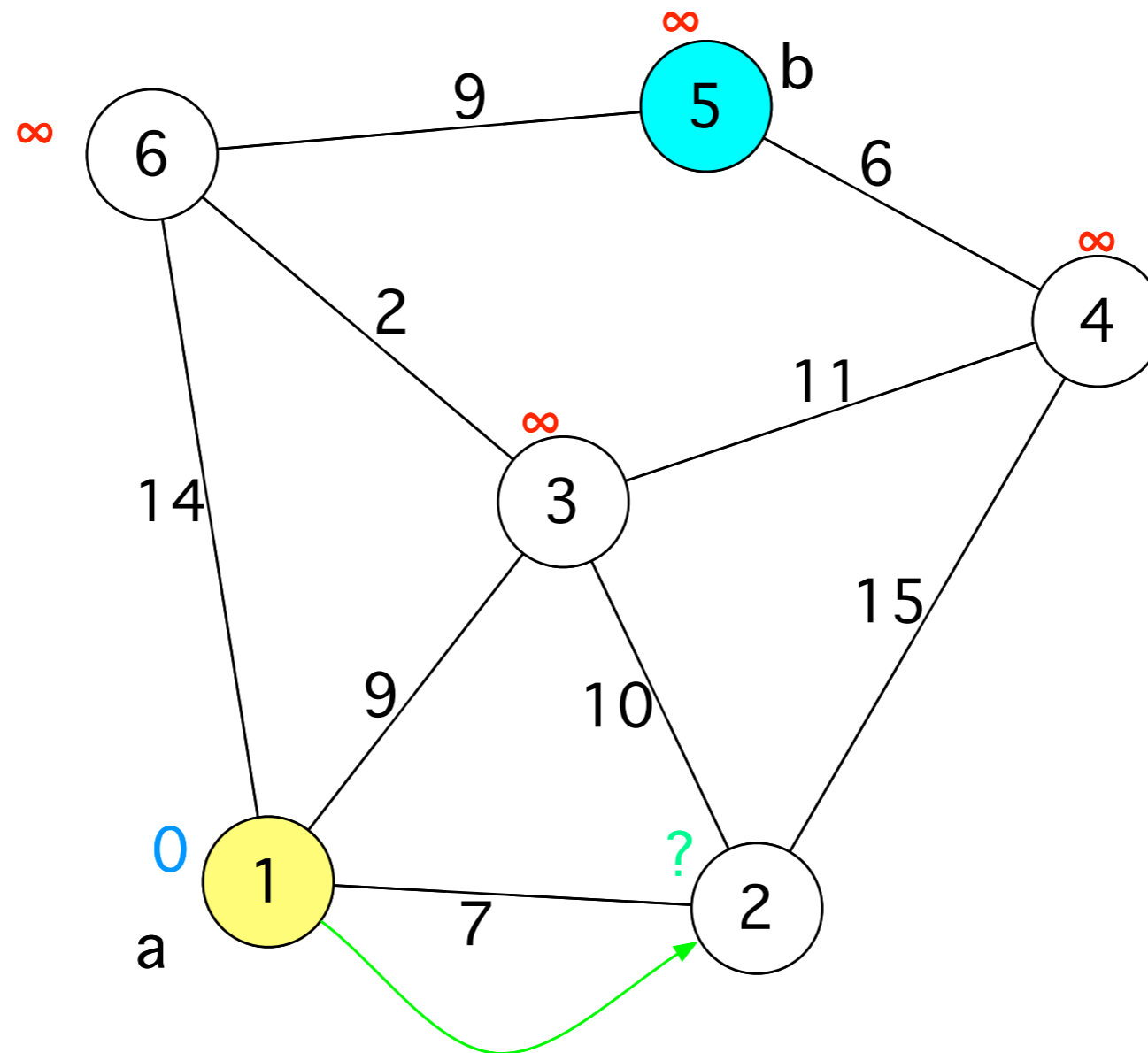
Graph Methods

Dijkstra's algorithm



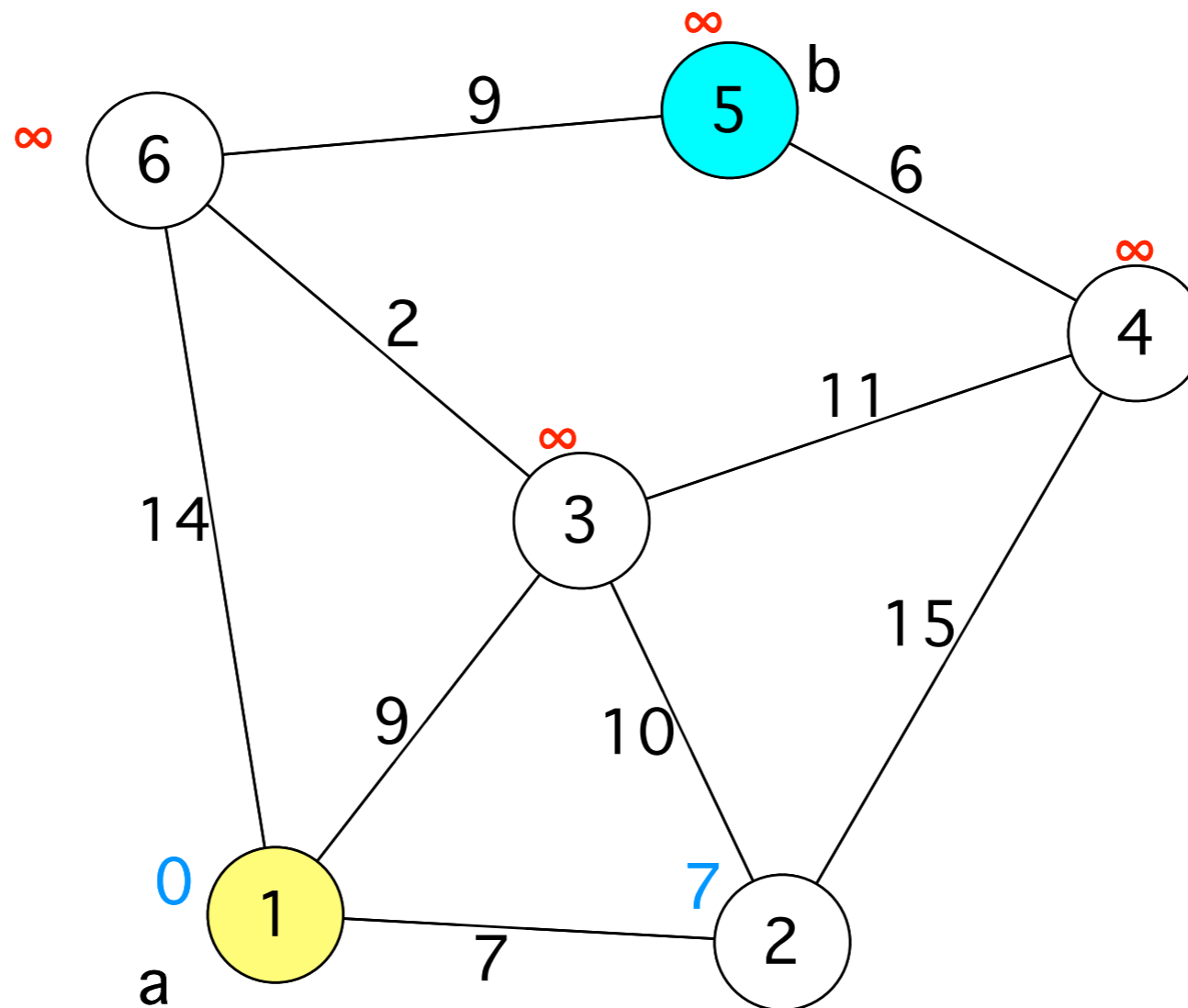
Graph Methods

Dijkstra's algorithm



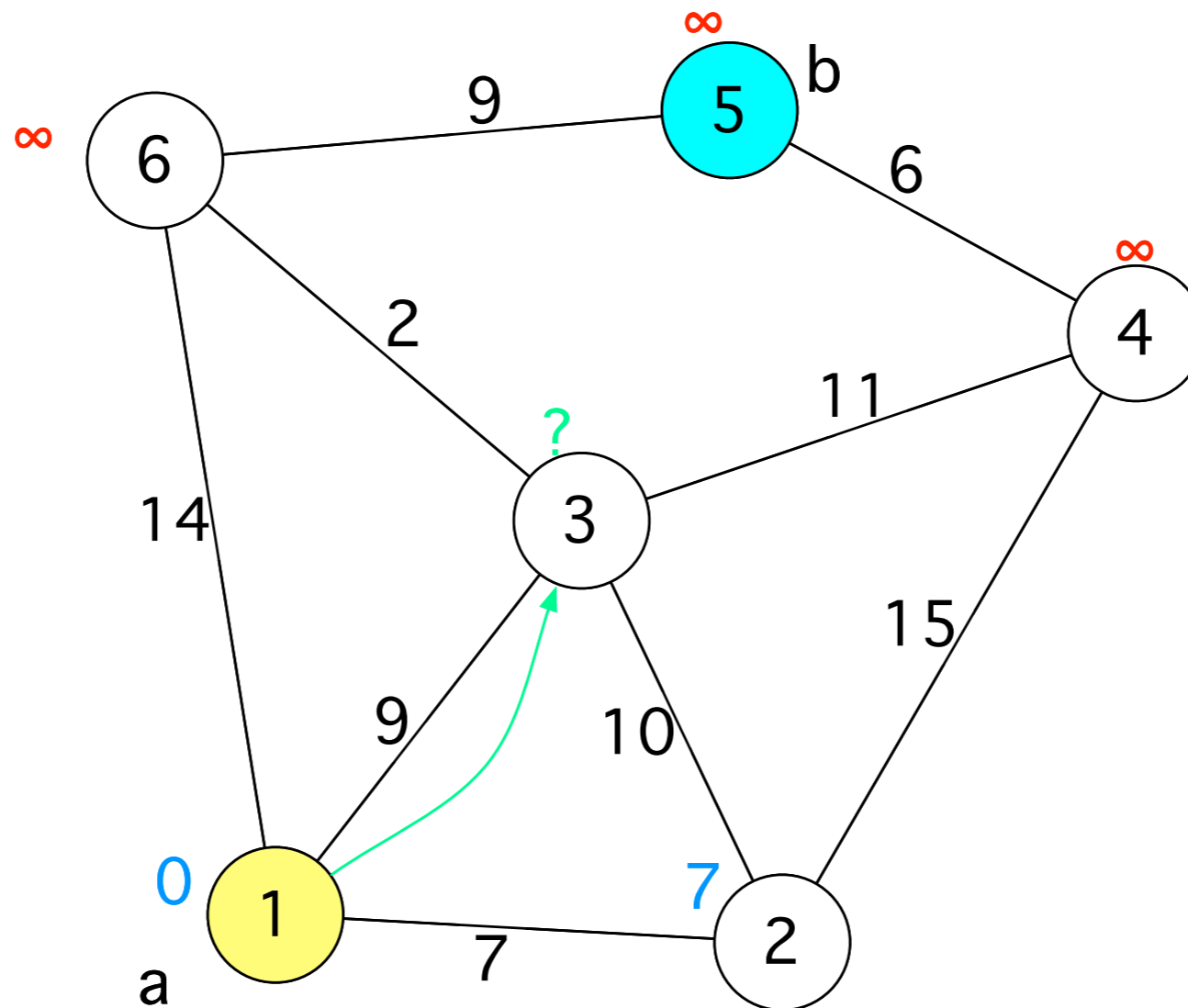
Graph Methods

Dijkstra's algorithm



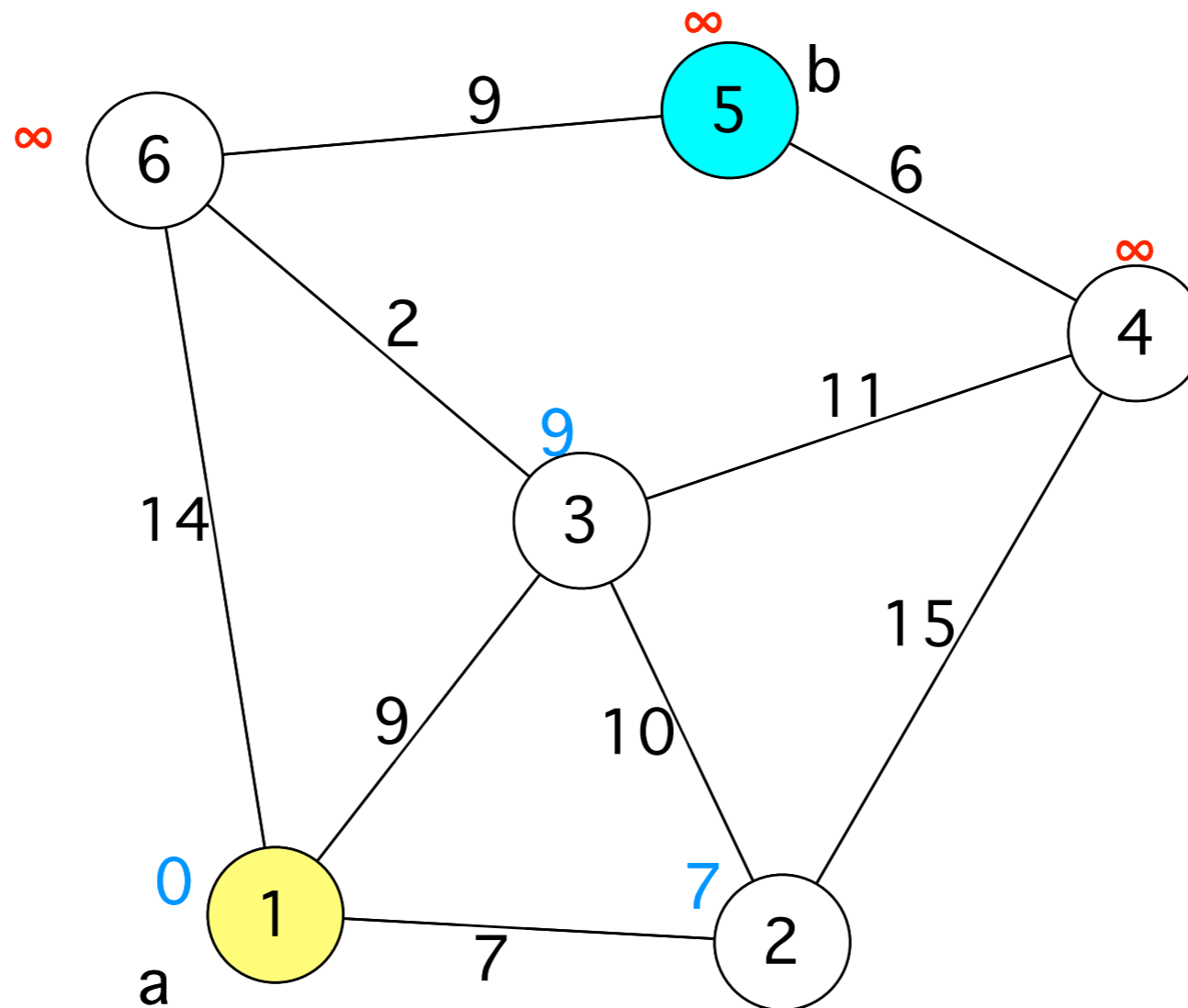
Graph Methods

Dijkstra's algorithm



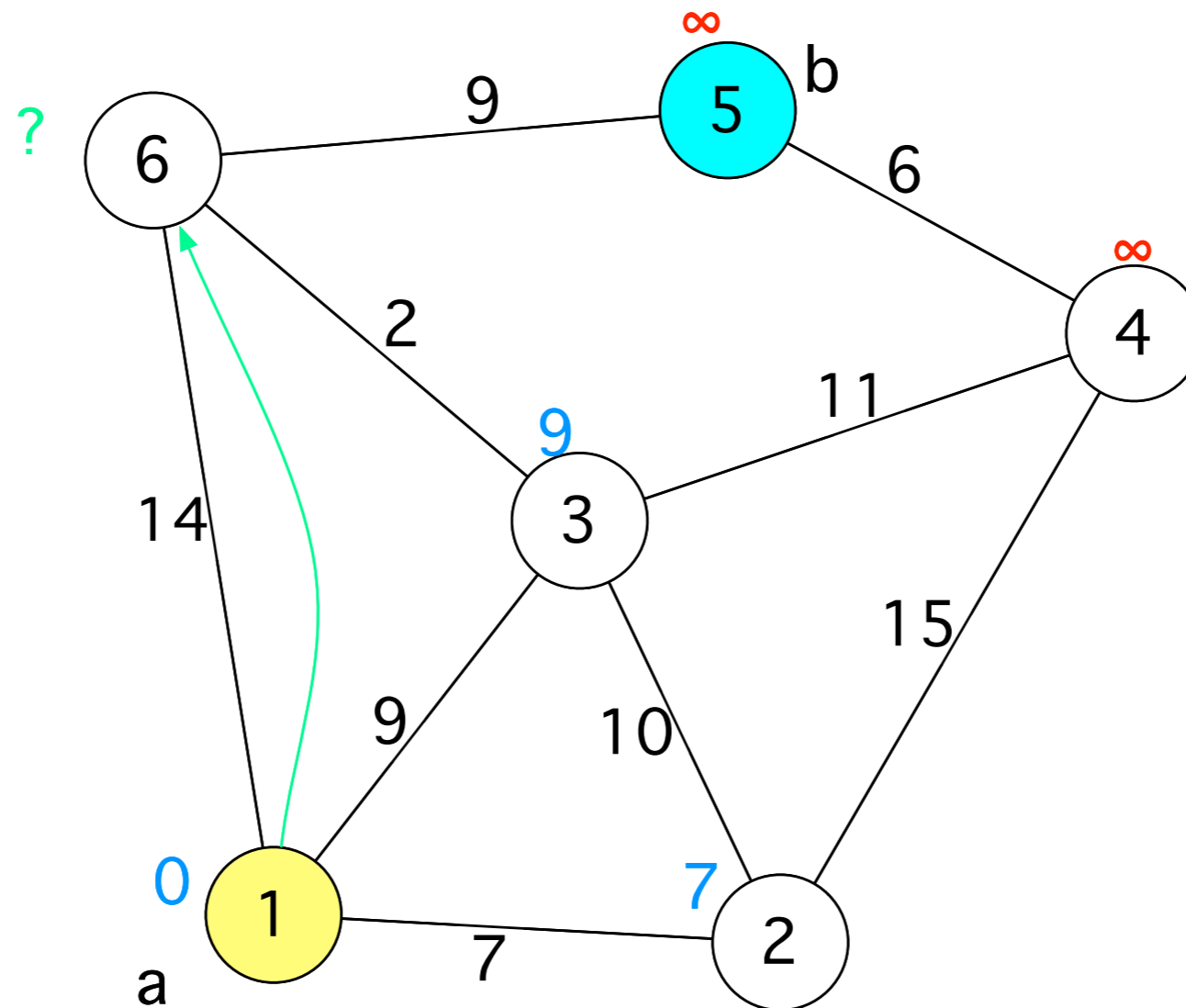
Graph Methods

Dijkstra's algorithm



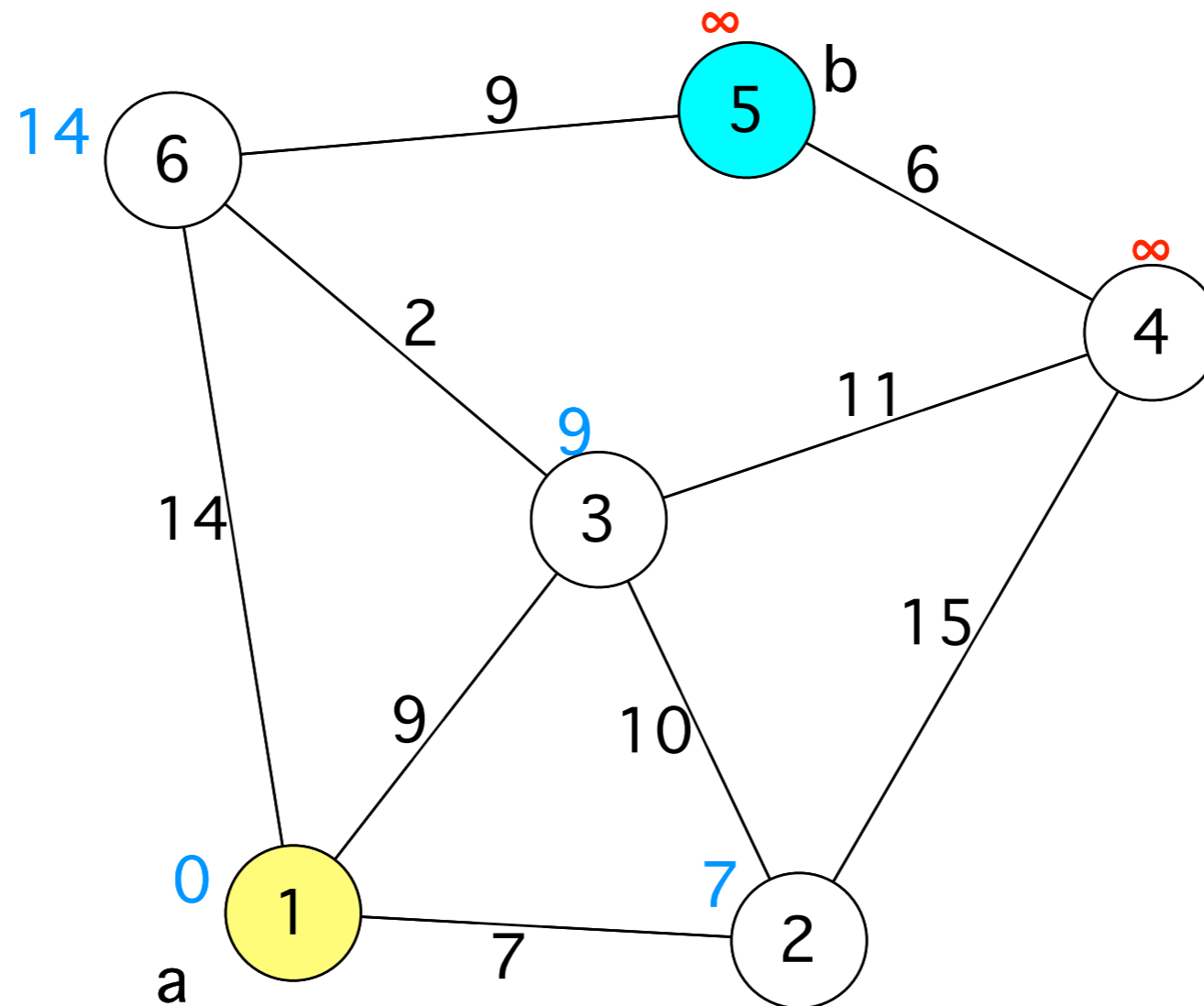
Graph Methods

Dijkstra's algorithm



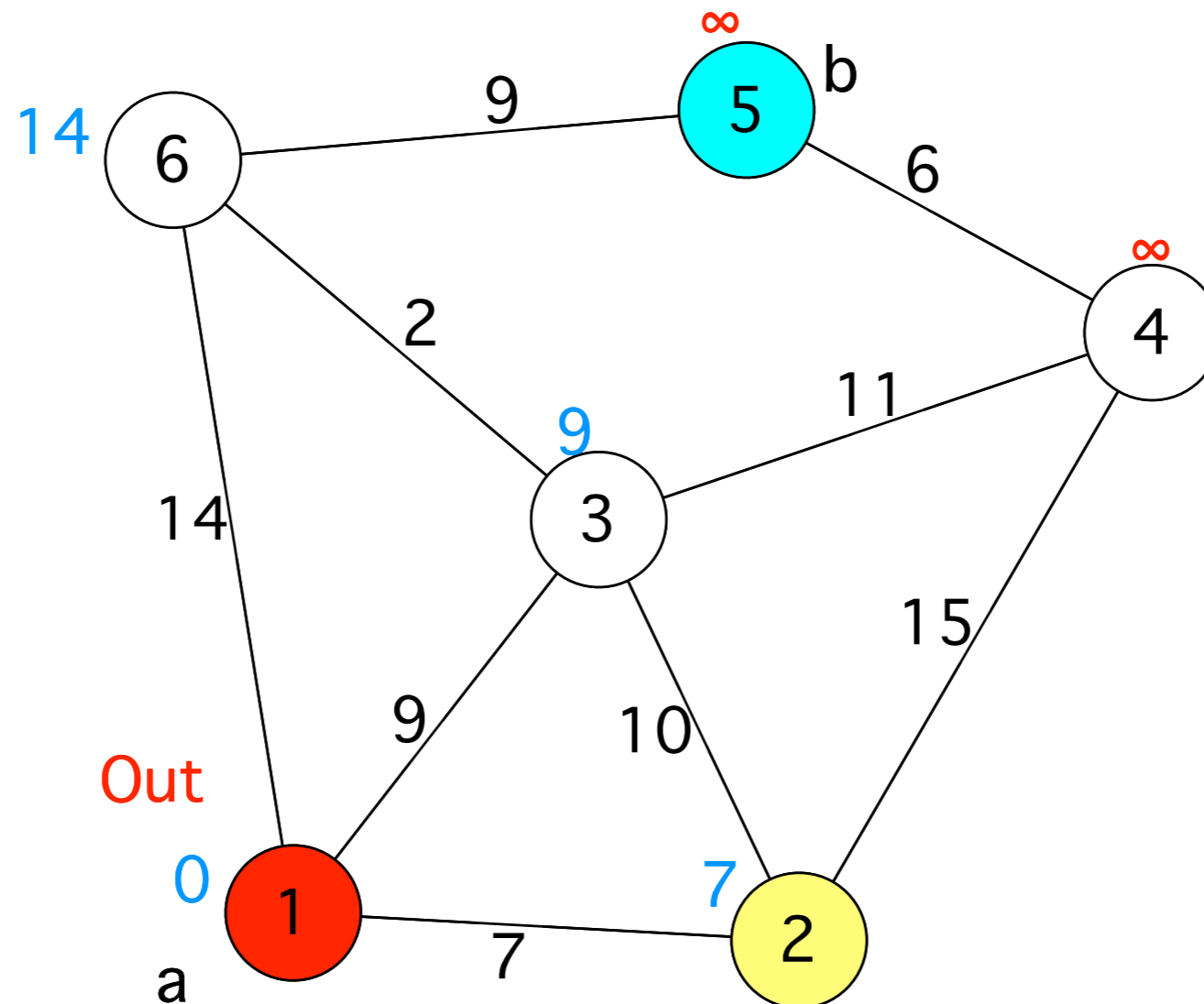
Graph Methods

Dijkstra's algorithm



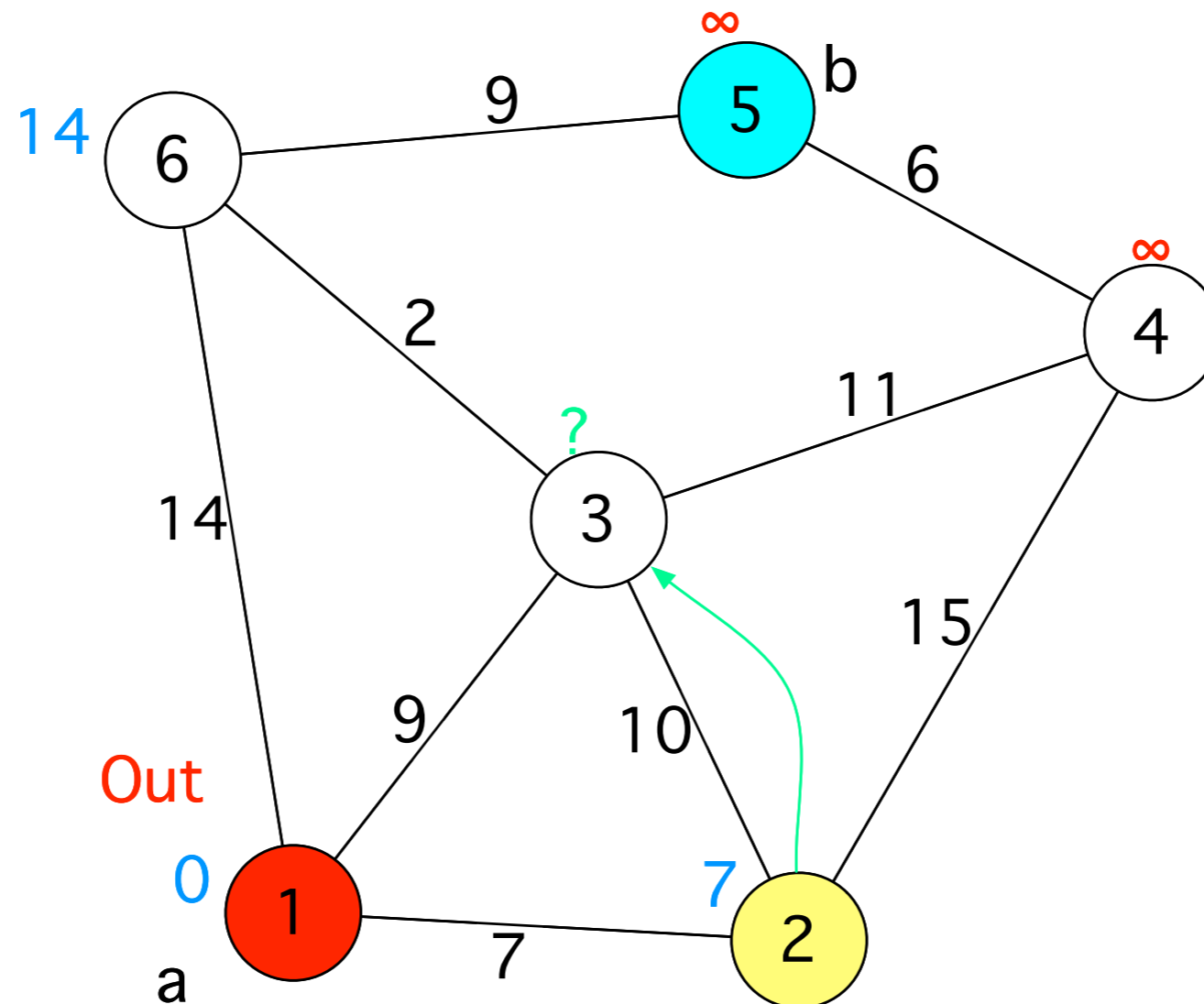
Graph Methods

Dijkstra's algorithm



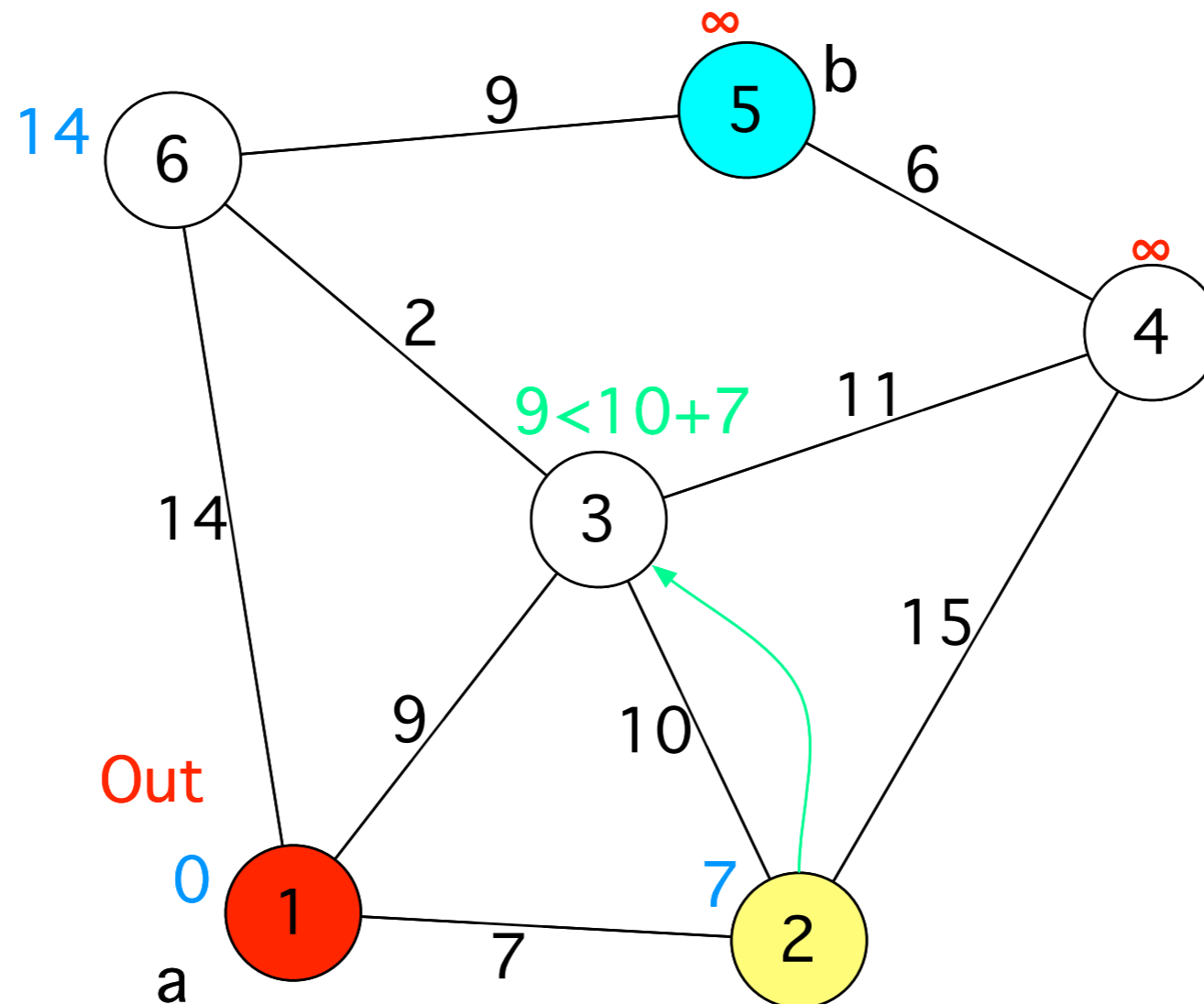
Graph Methods

Dijkstra's algorithm



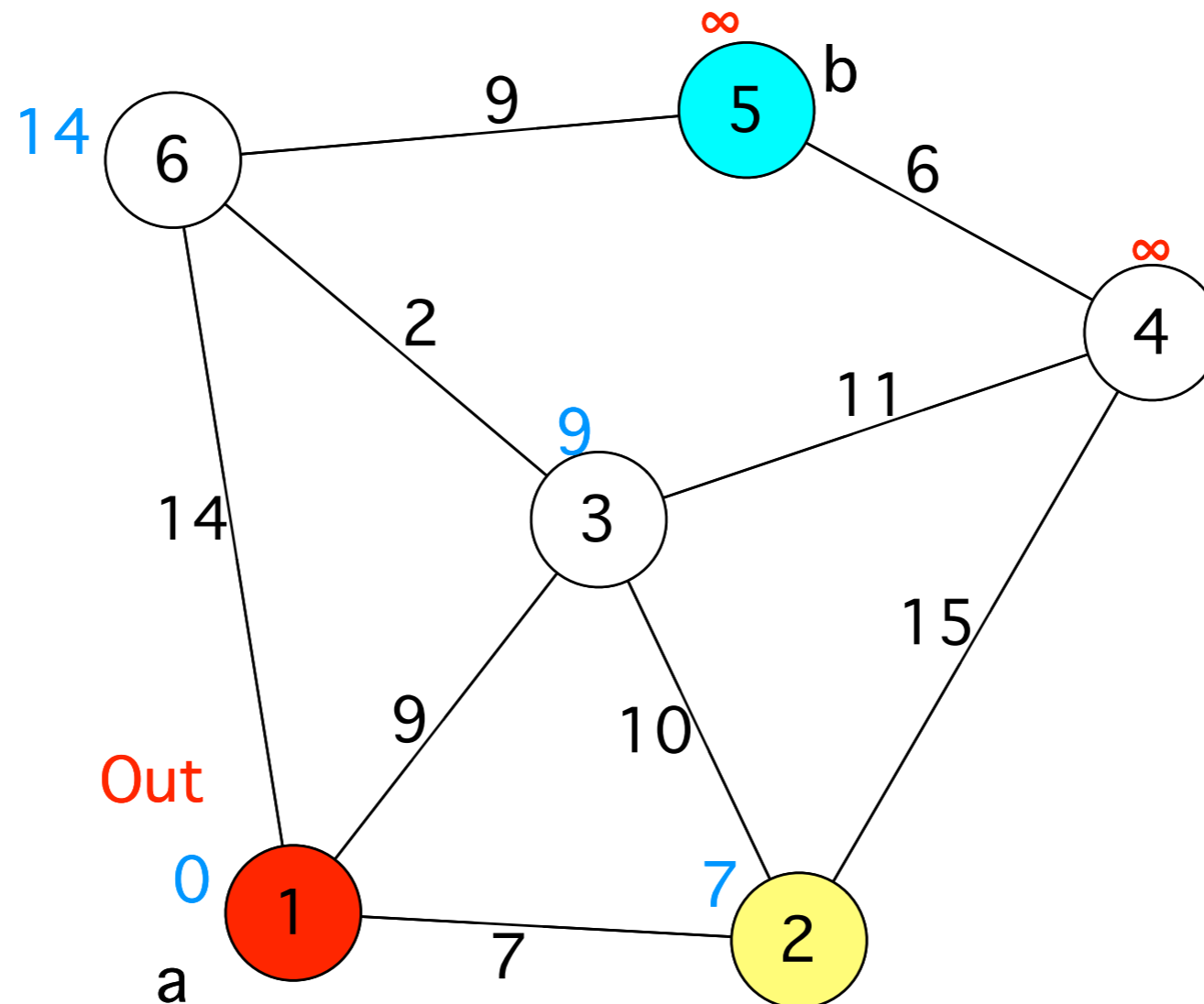
Graph Methods

Dijkstra's algorithm



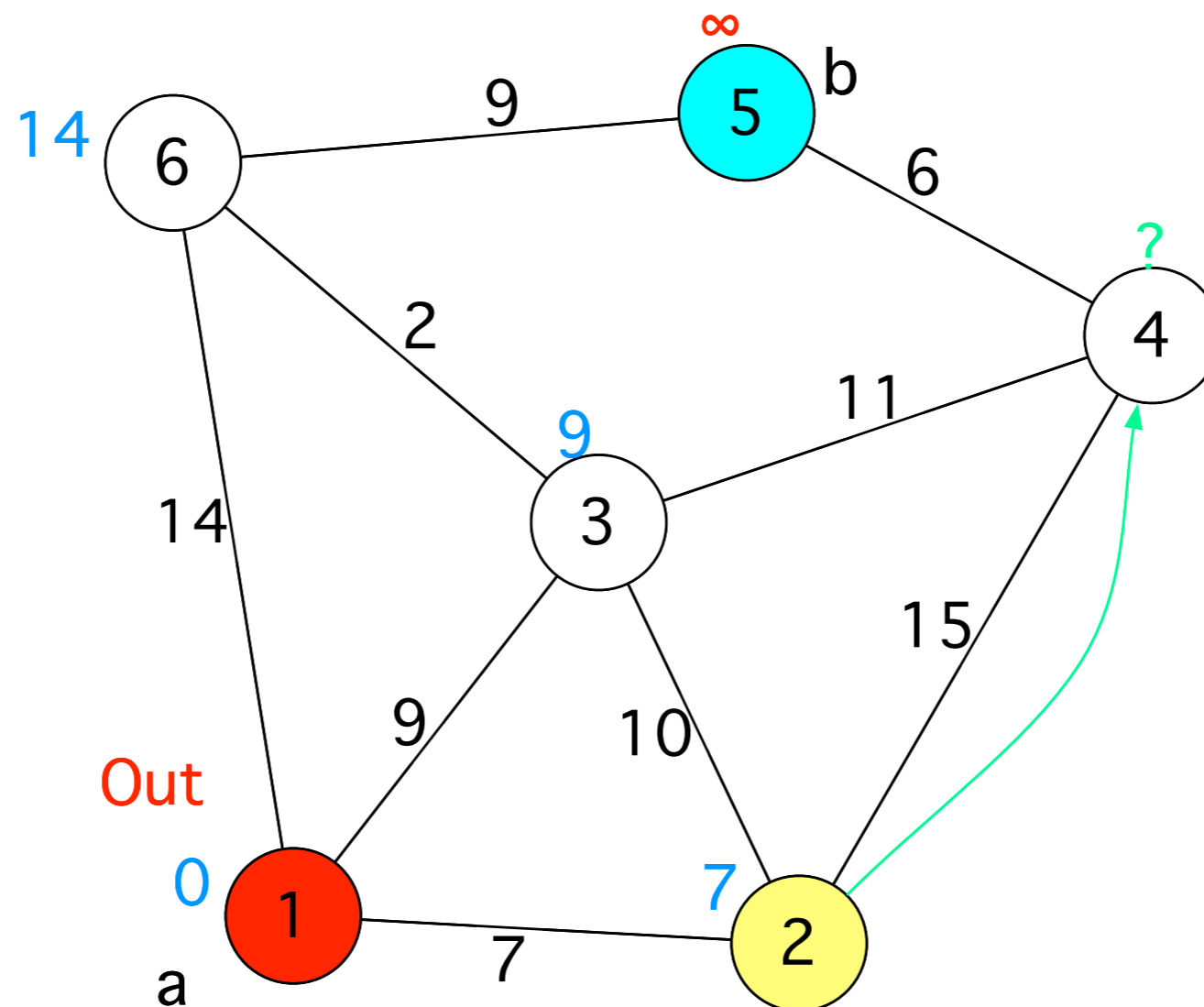
Graph Methods

Dijkstra's algorithm



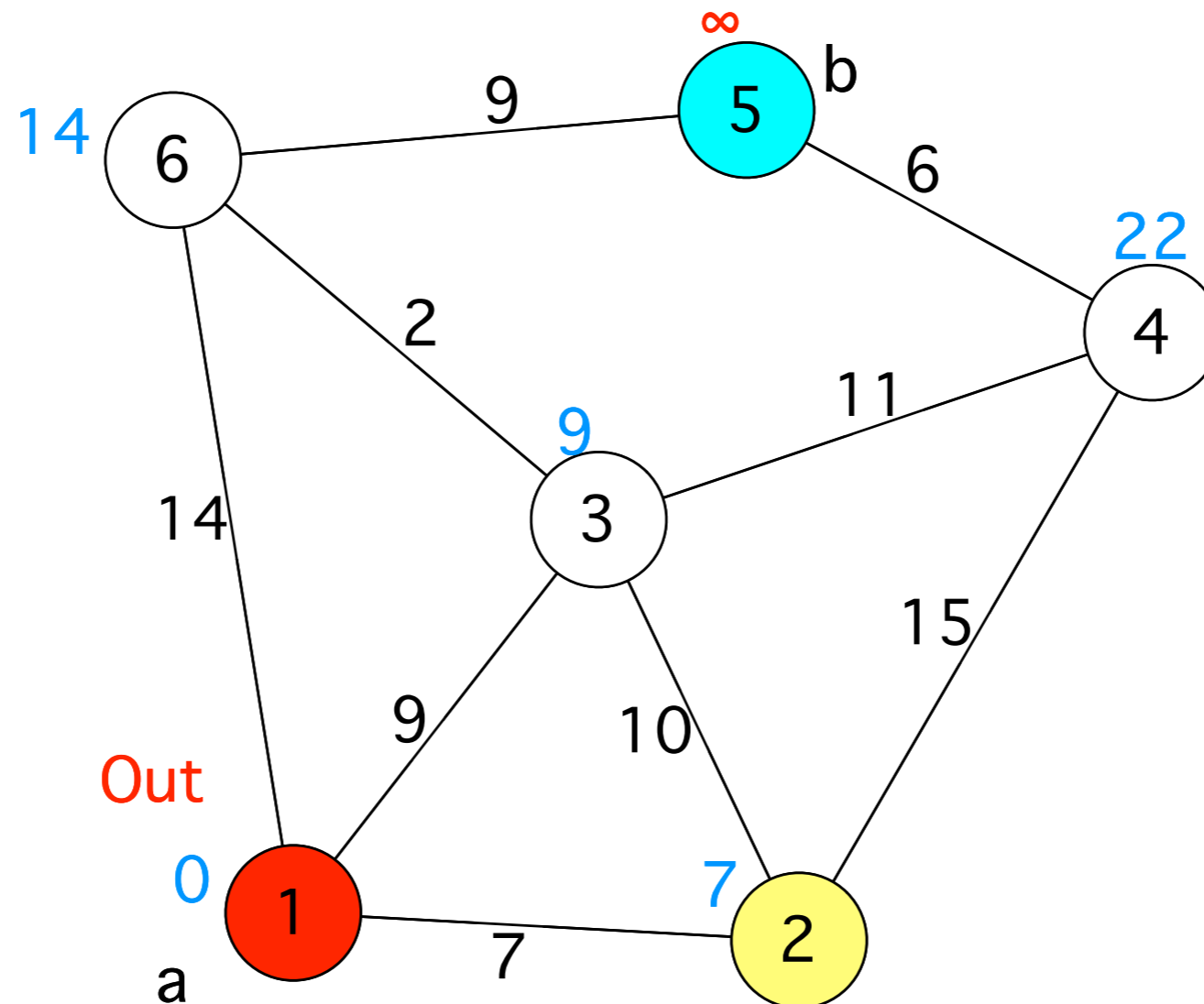
Graph Methods

Dijkstra's algorithm



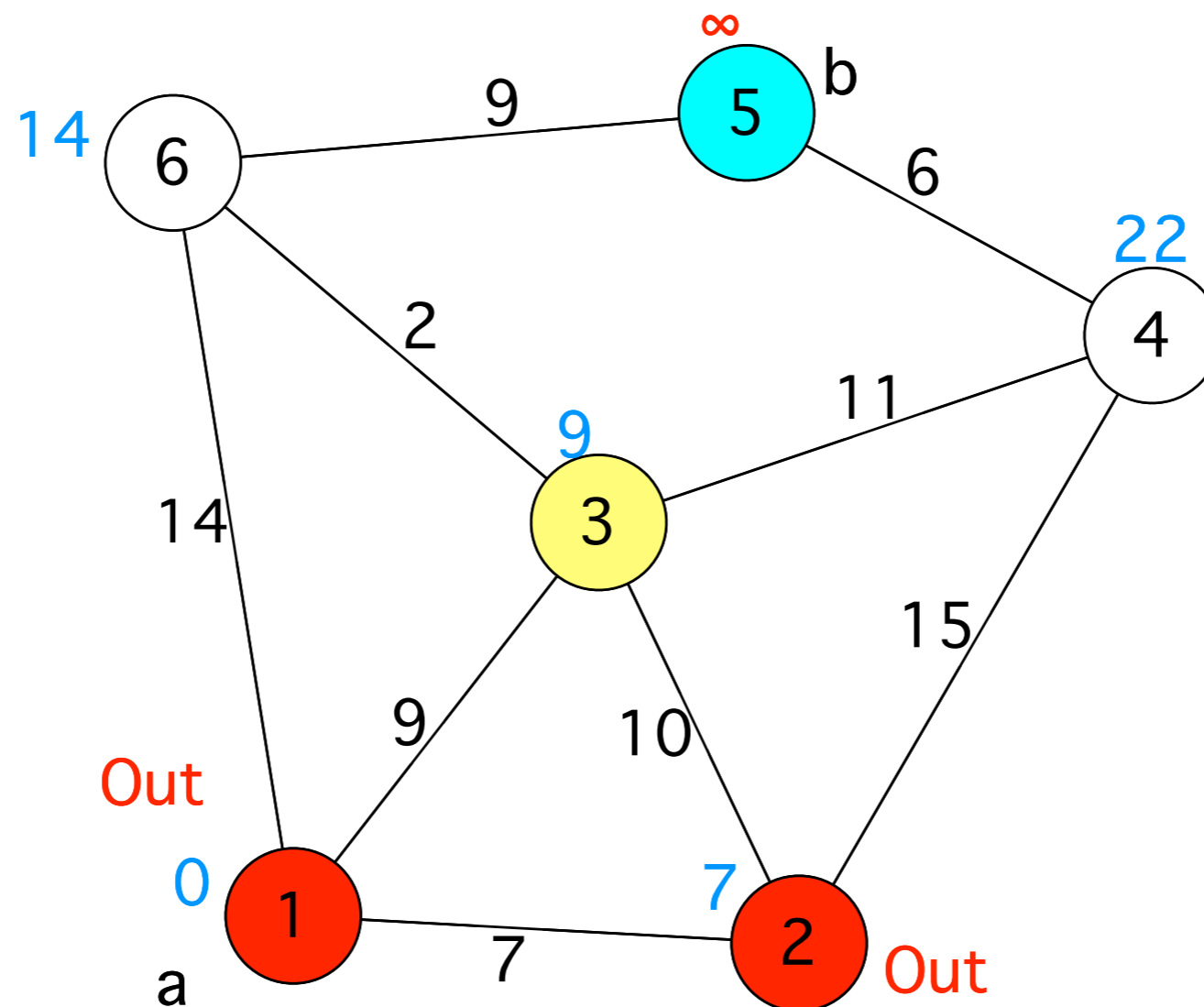
Graph Methods

Dijkstra's algorithm



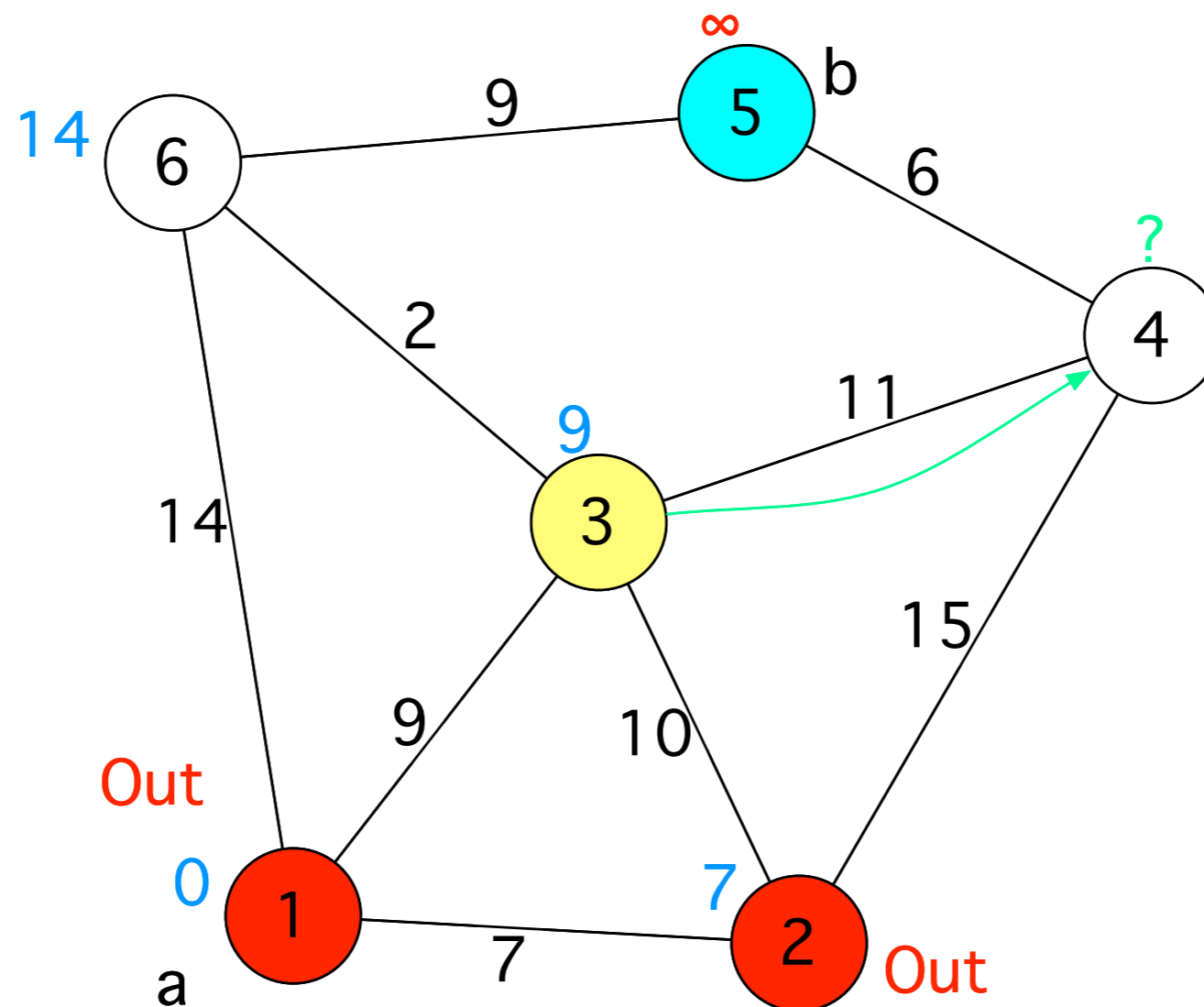
Graph Methods

Dijkstra's algorithm



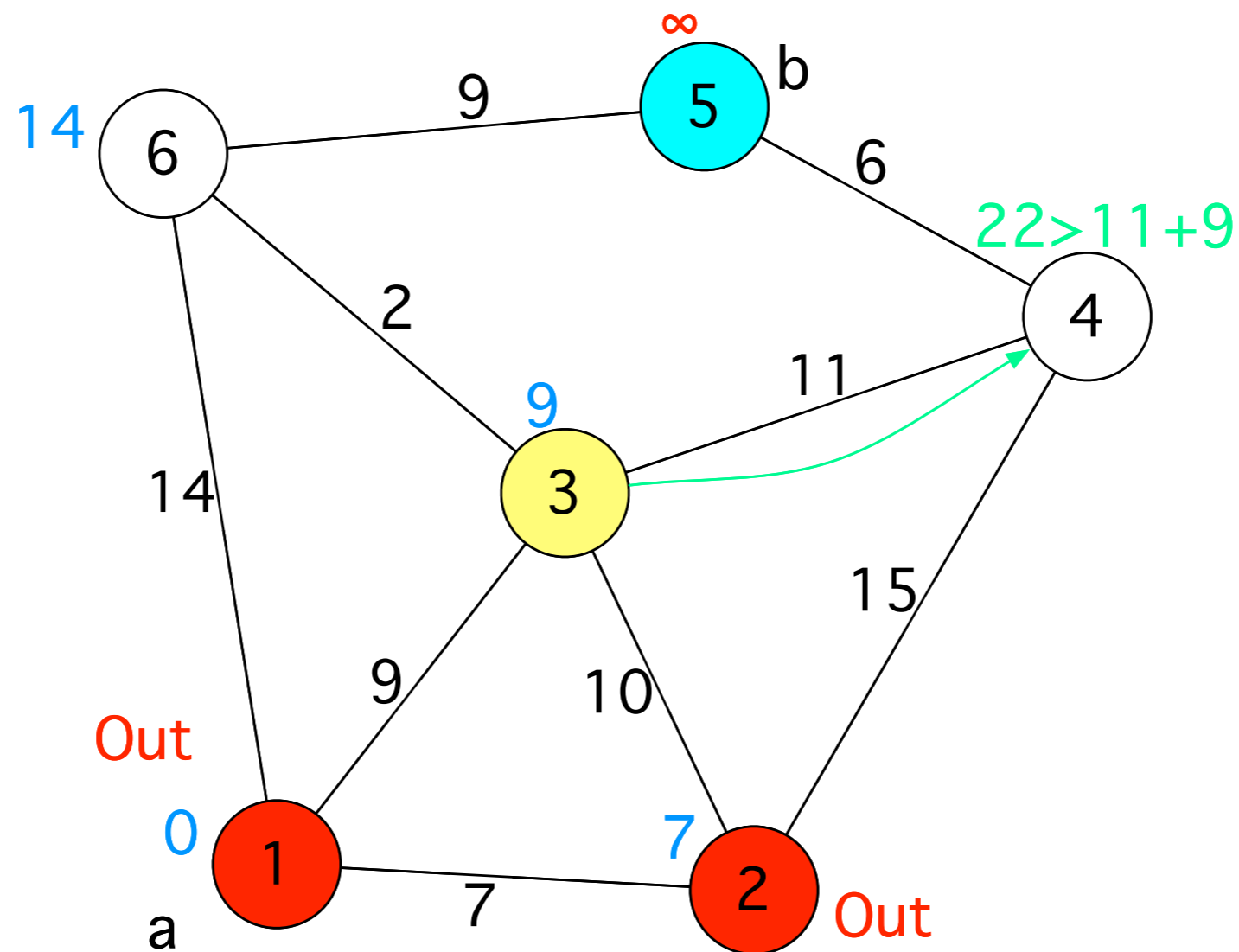
Graph Methods

Dijkstra's algorithm



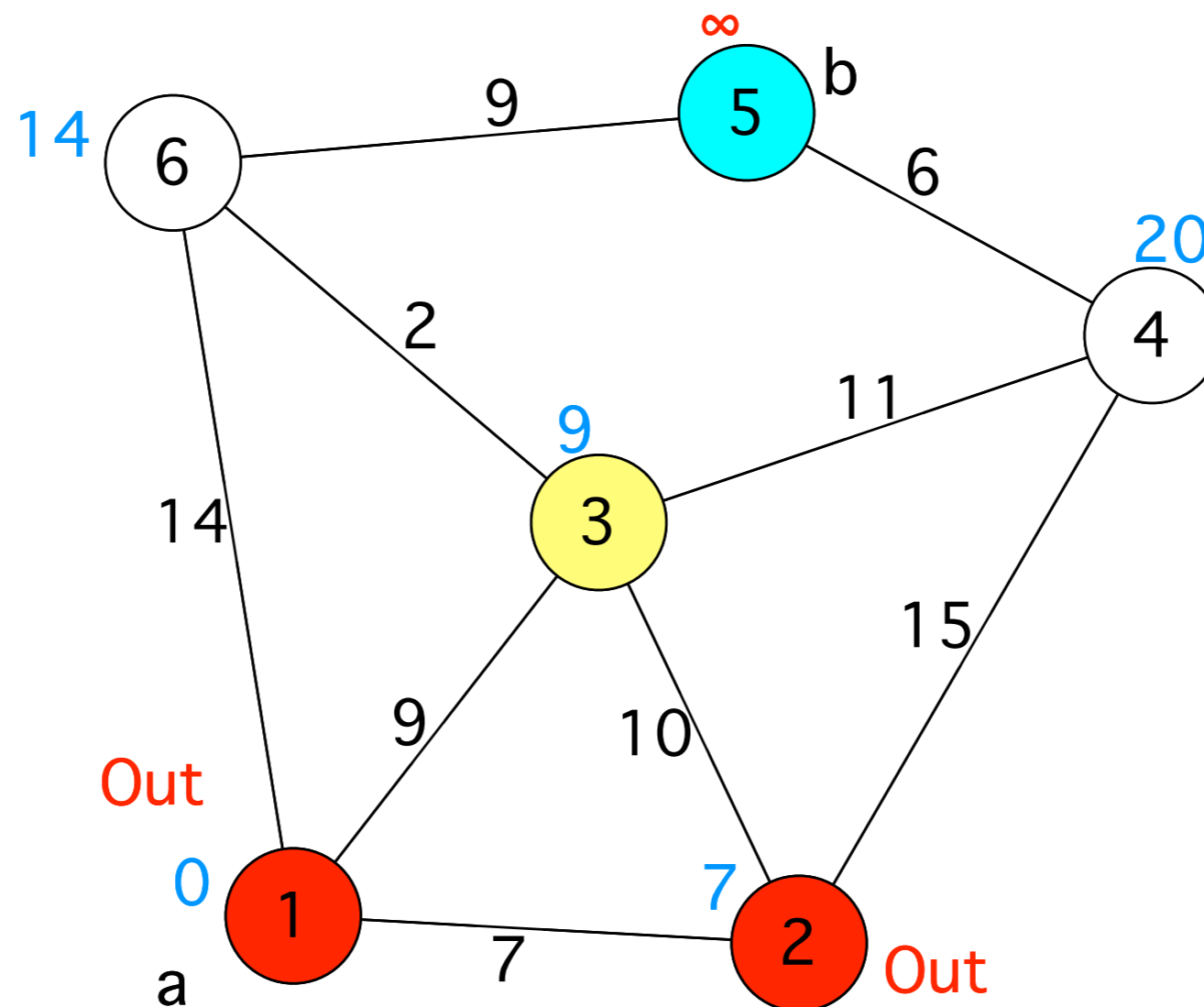
Graph Methods

Dijkstra's algorithm



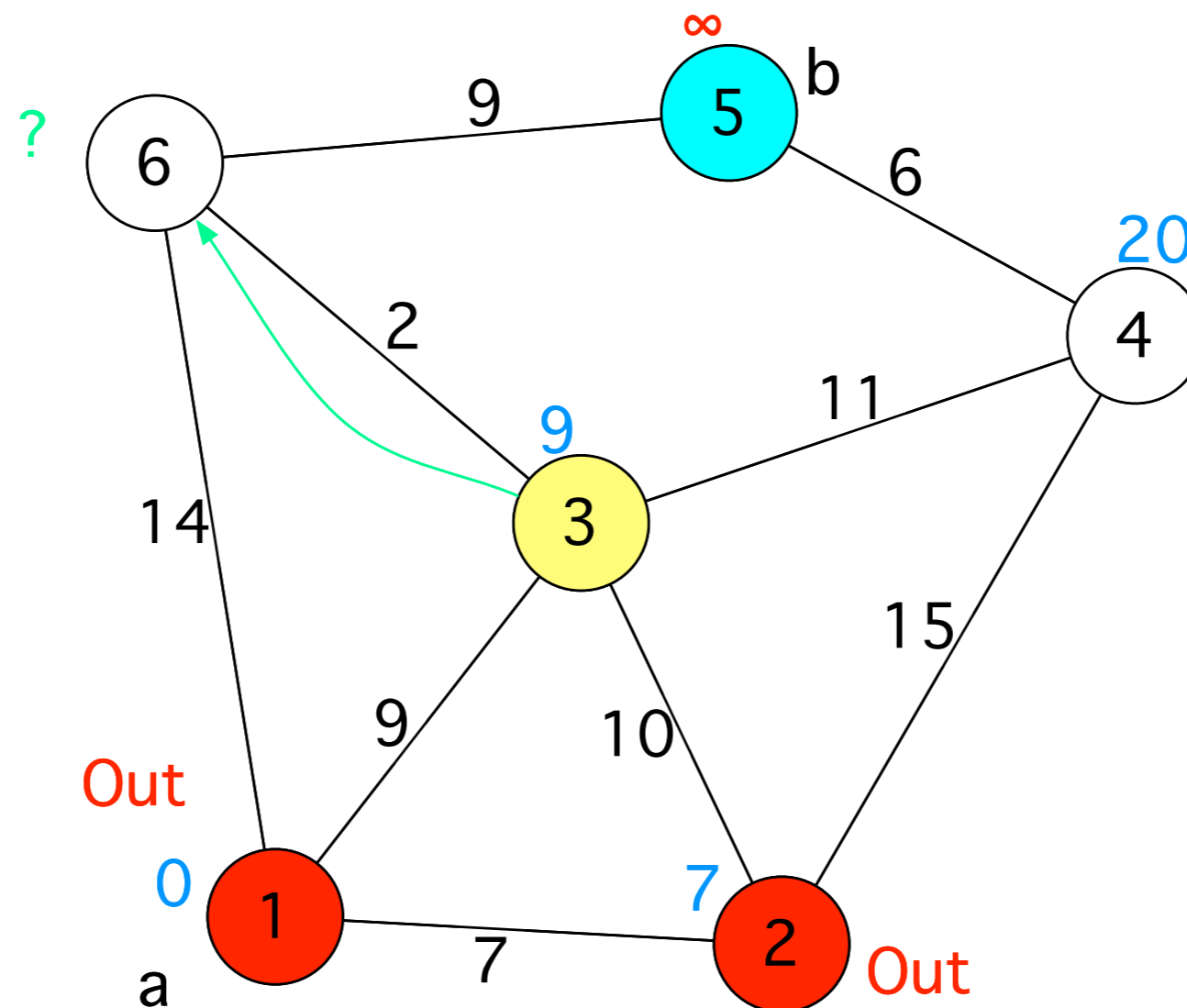
Graph Methods

Dijkstra's algorithm



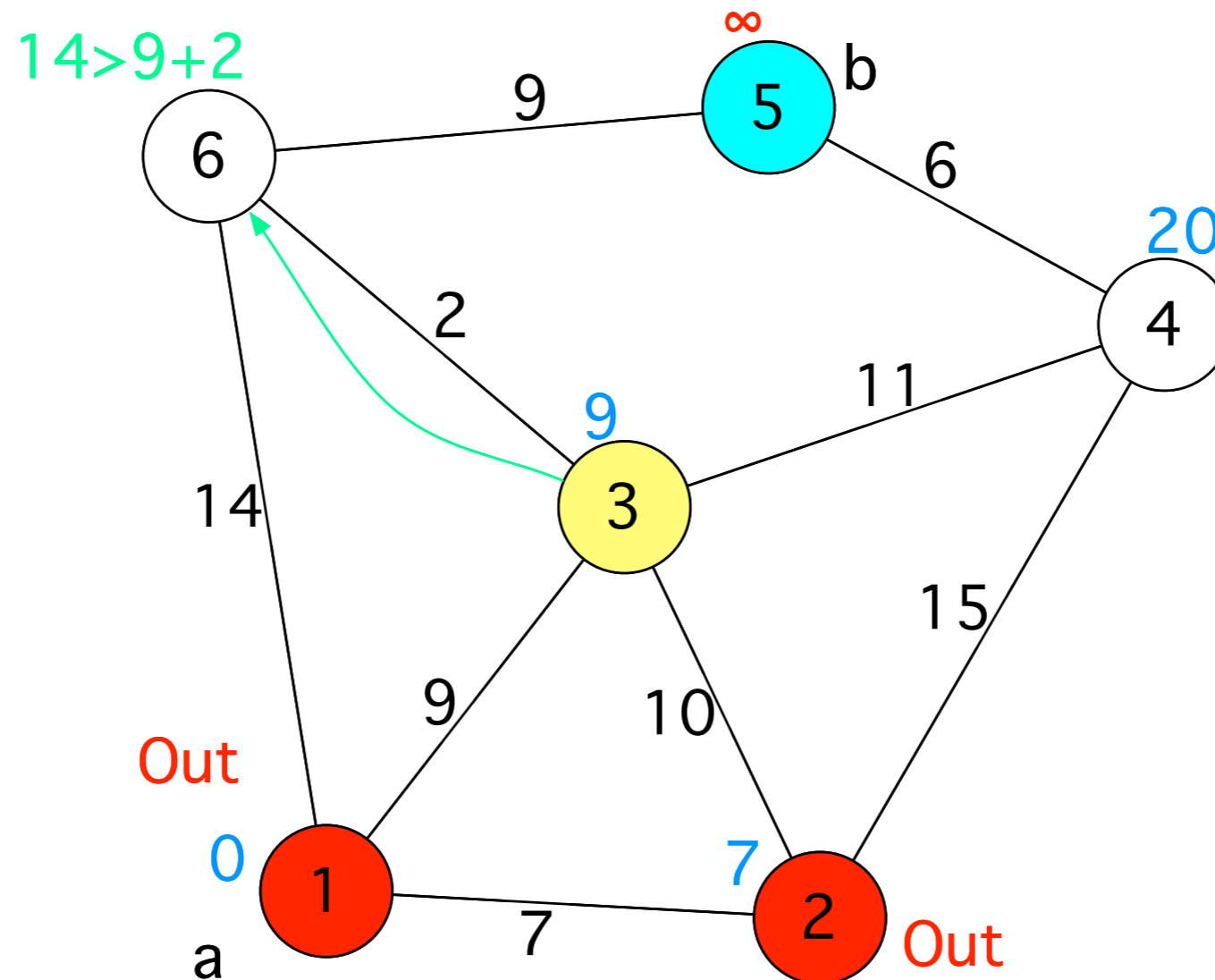
Graph Methods

Dijkstra's algorithm



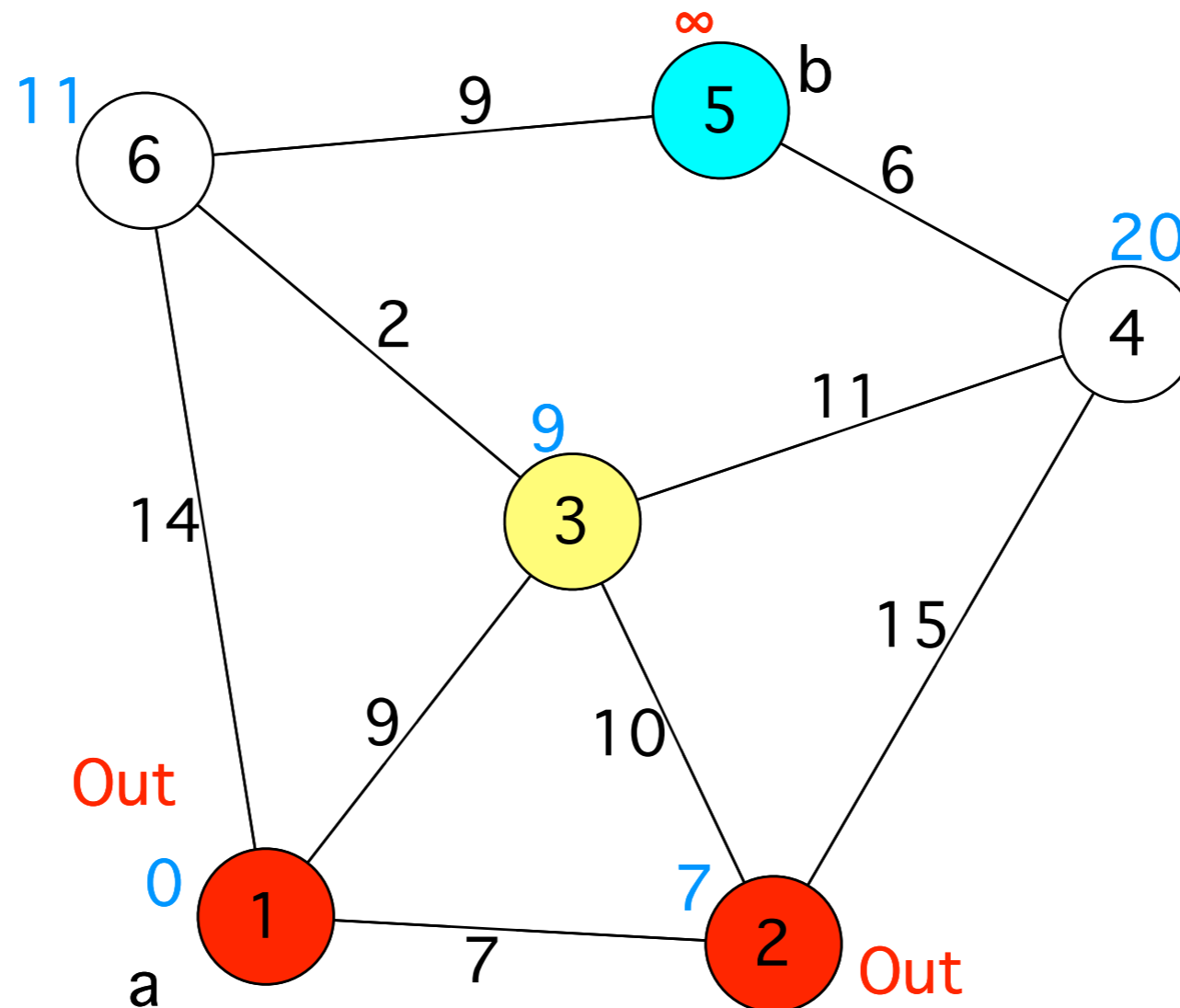
Graph Methods

Dijkstra's algorithm



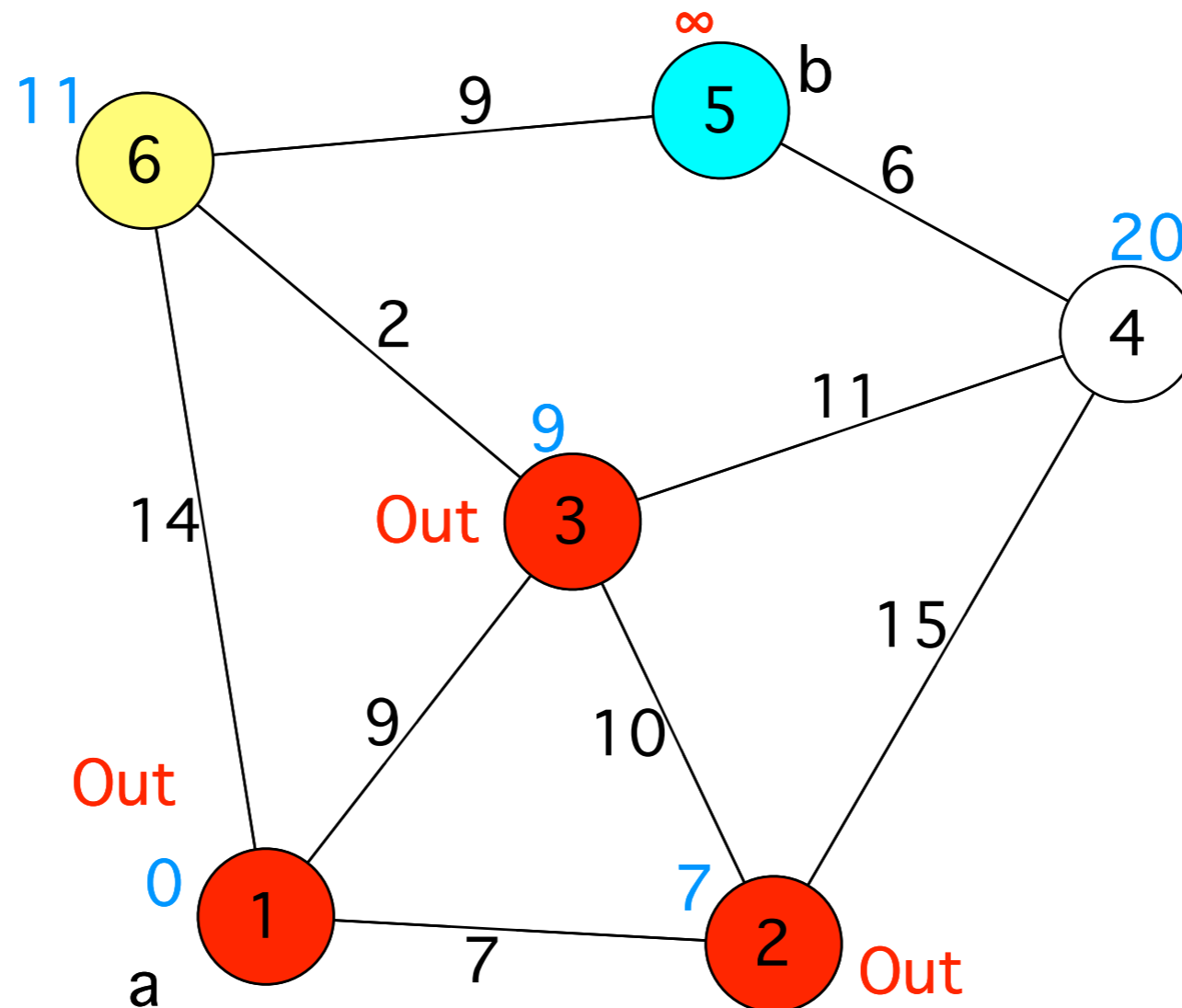
Graph Methods

Dijkstra's algorithm



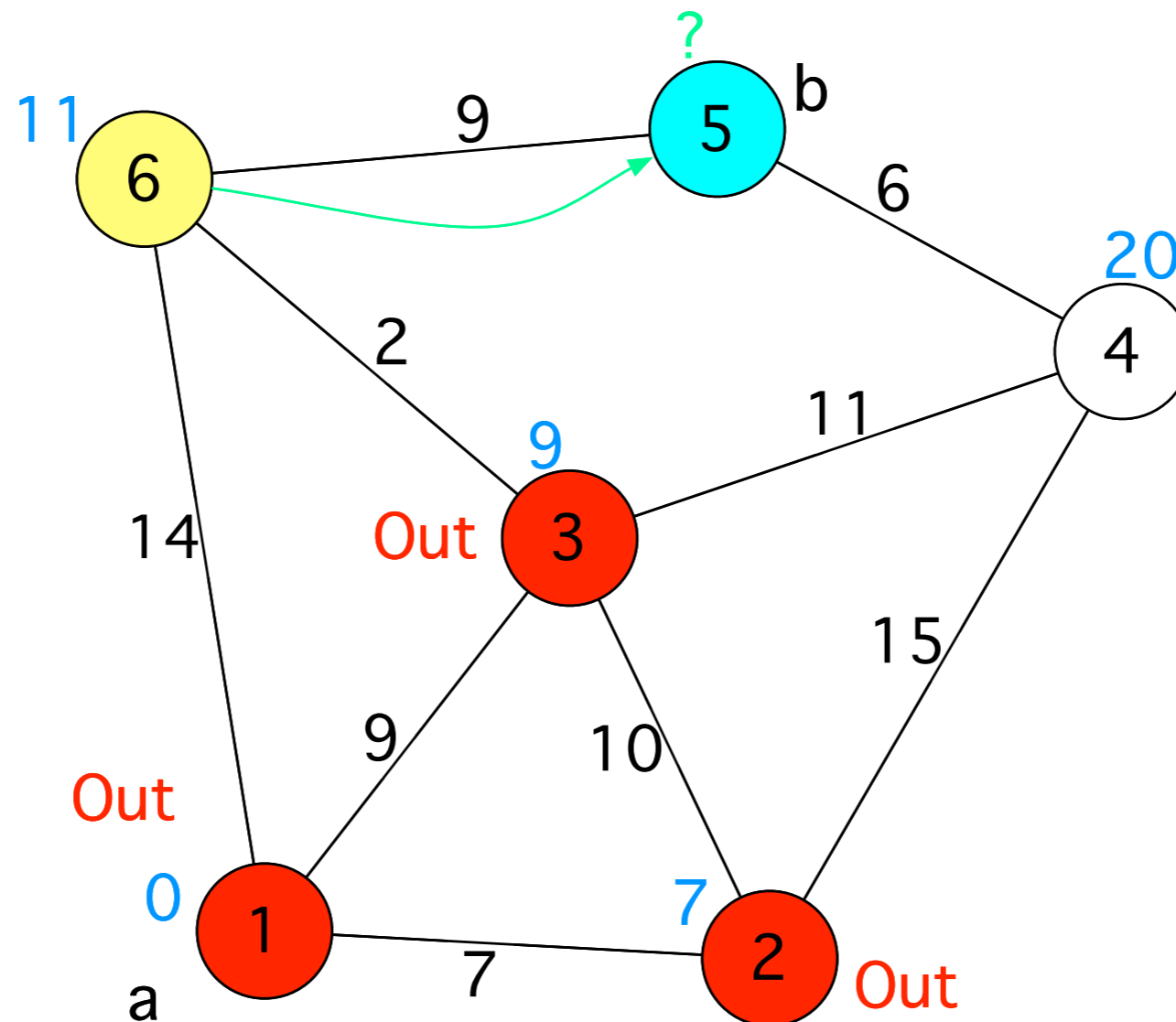
Graph Methods

Dijkstra's algorithm



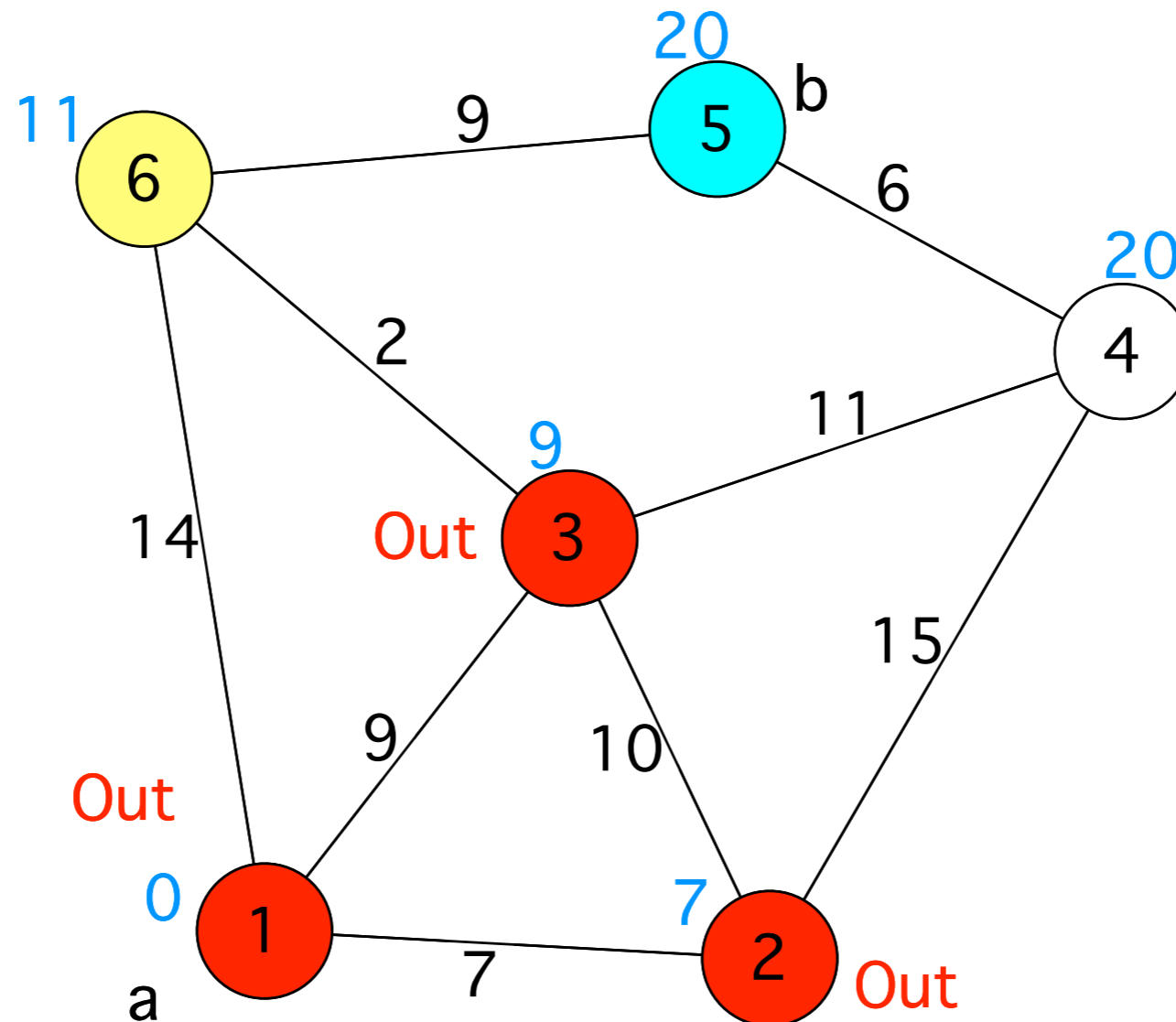
Graph Methods

Dijkstra's algorithm



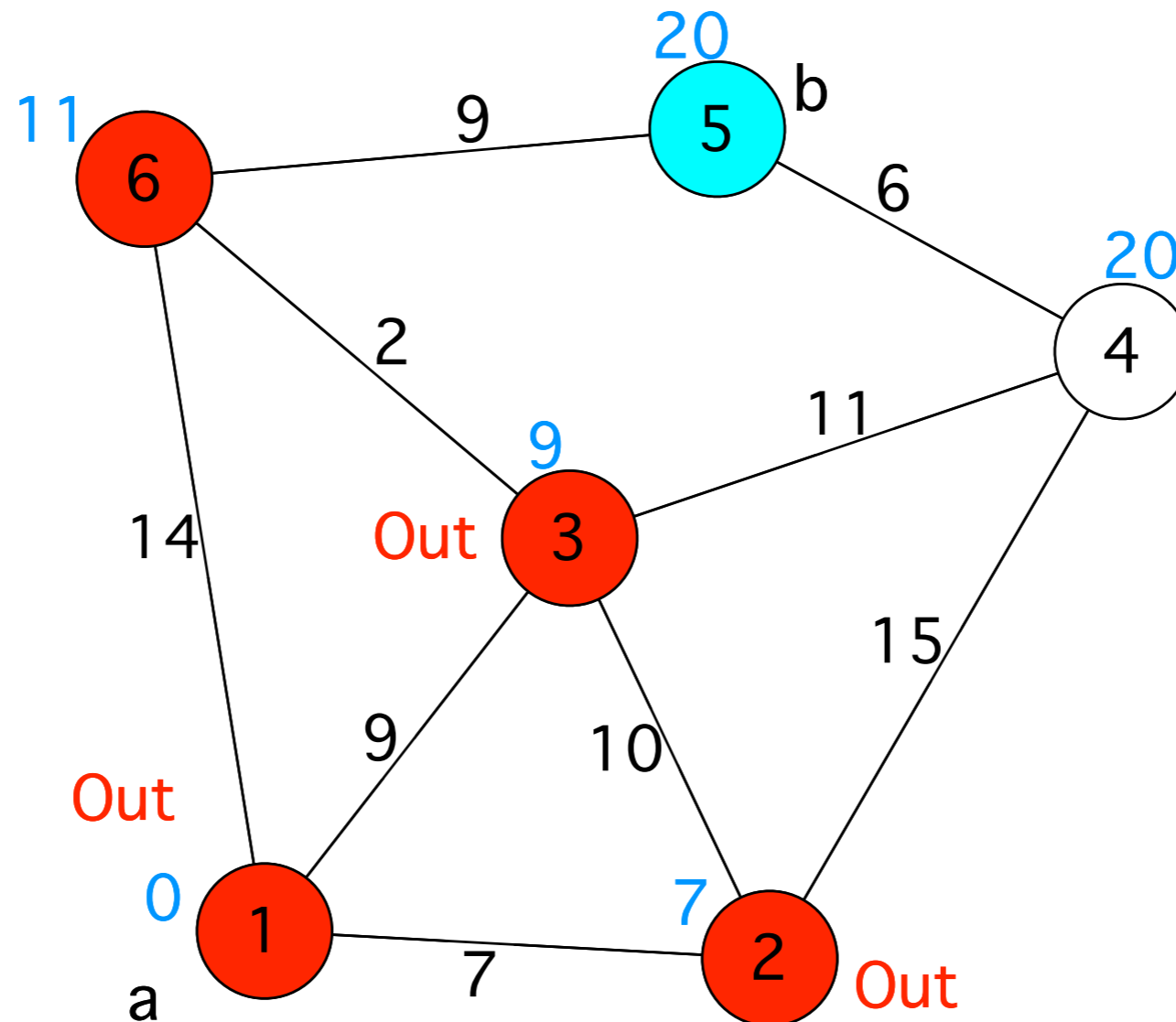
Graph Methods

Dijkstra's algorithm



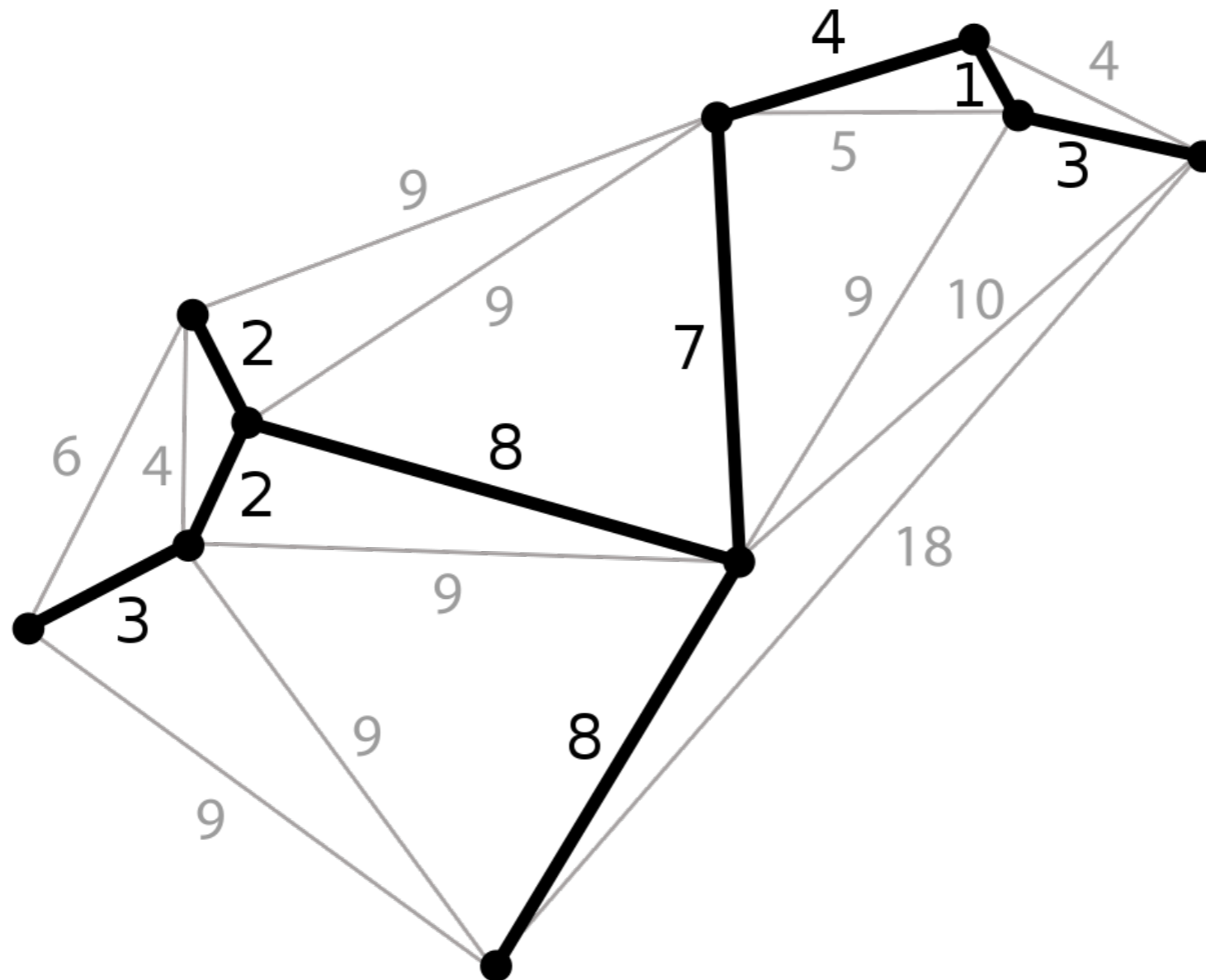
Graph Methods

Dijkstra's algorithm



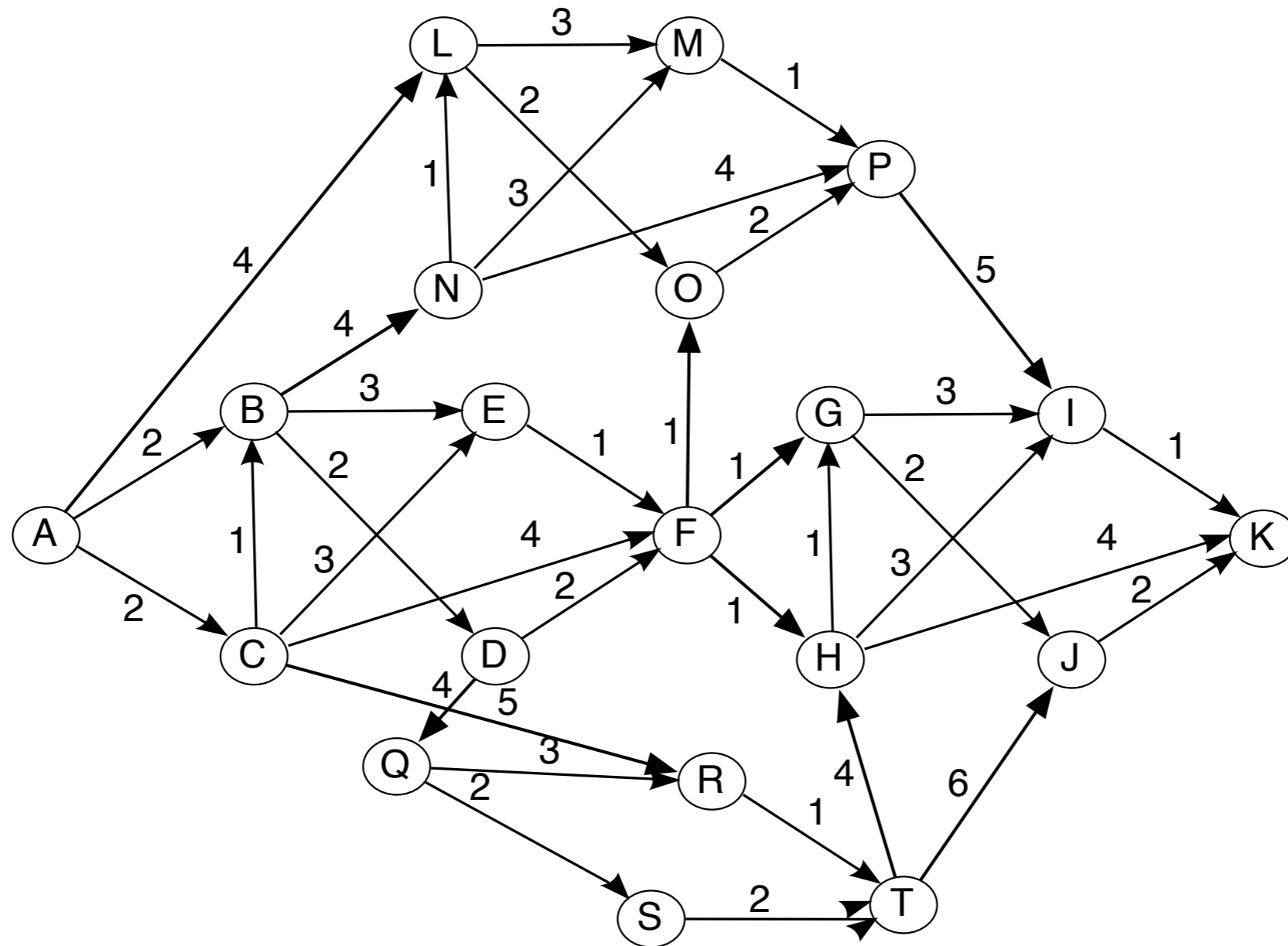
Graph Methods

minimum spanning tree



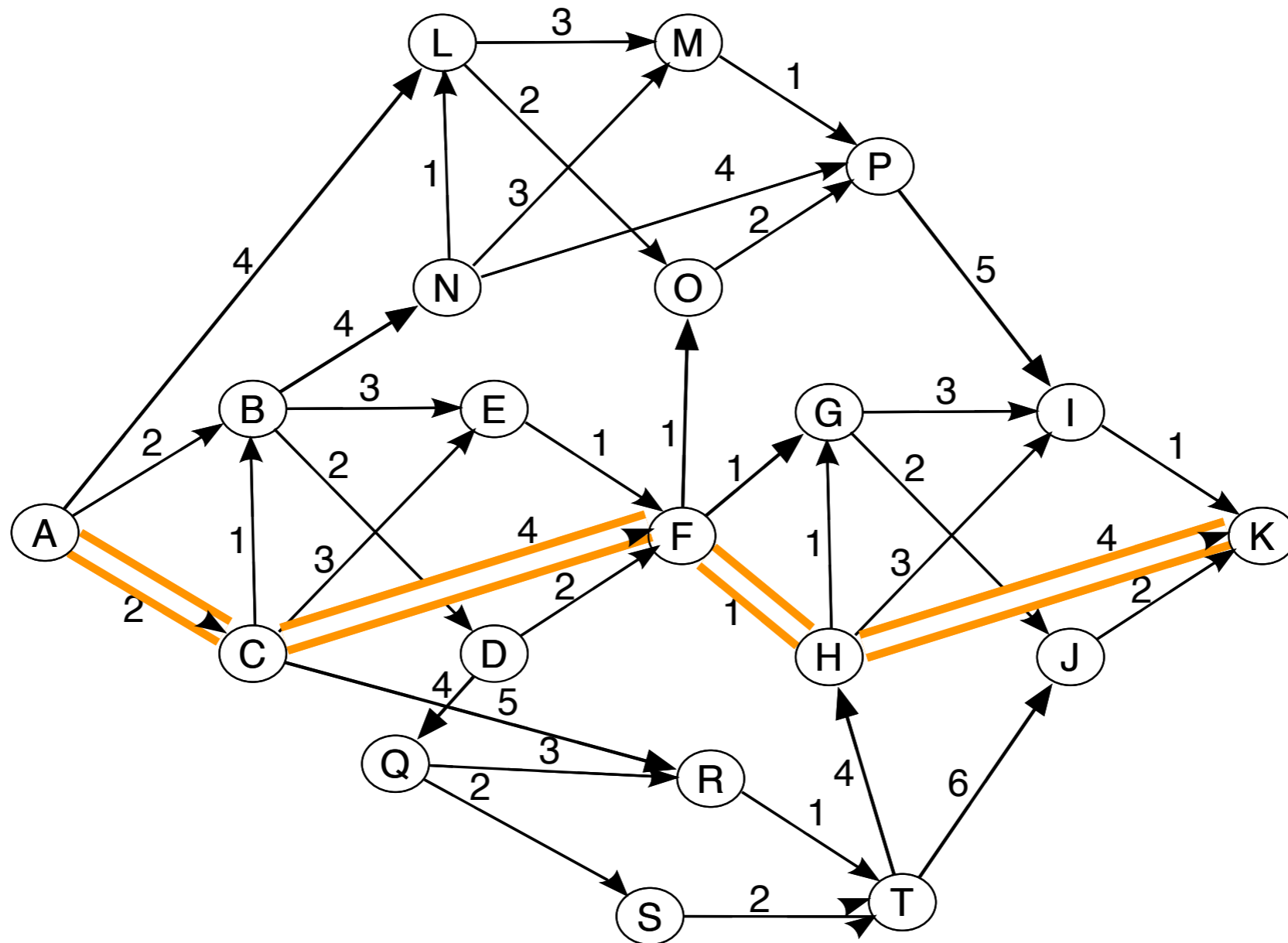
Graph Methods

min cut/max flow



Graph Methods

min cut/max flow



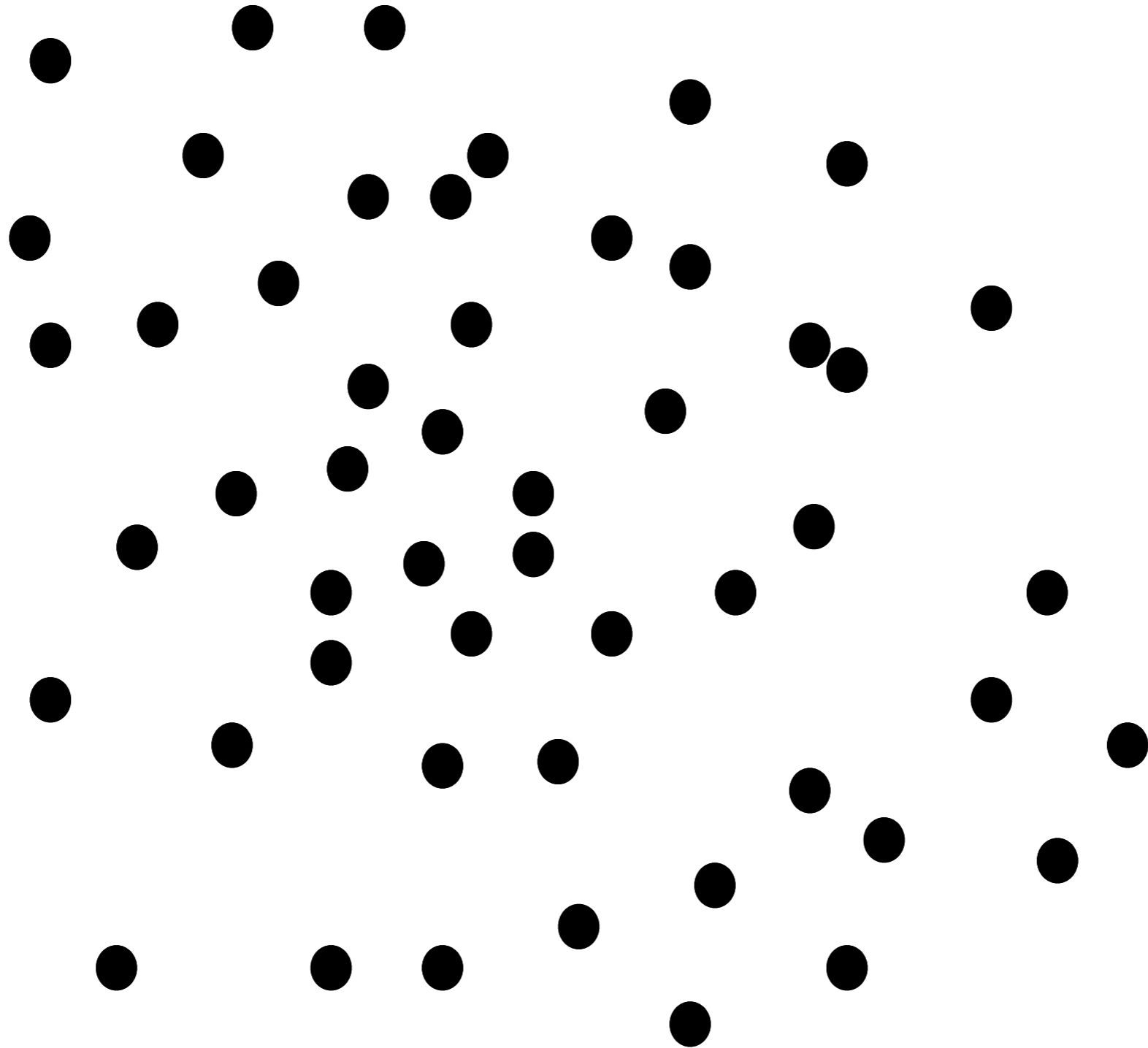
Graph-Based Path Finding

- A **directed graph** is created based on the **friend** connections amongst artists found on **myspace**
- The edges of this graph are weighted using content-based similarity
- Playlists are constructed through the use of the **max flow/min cut** from a starting to ending artist

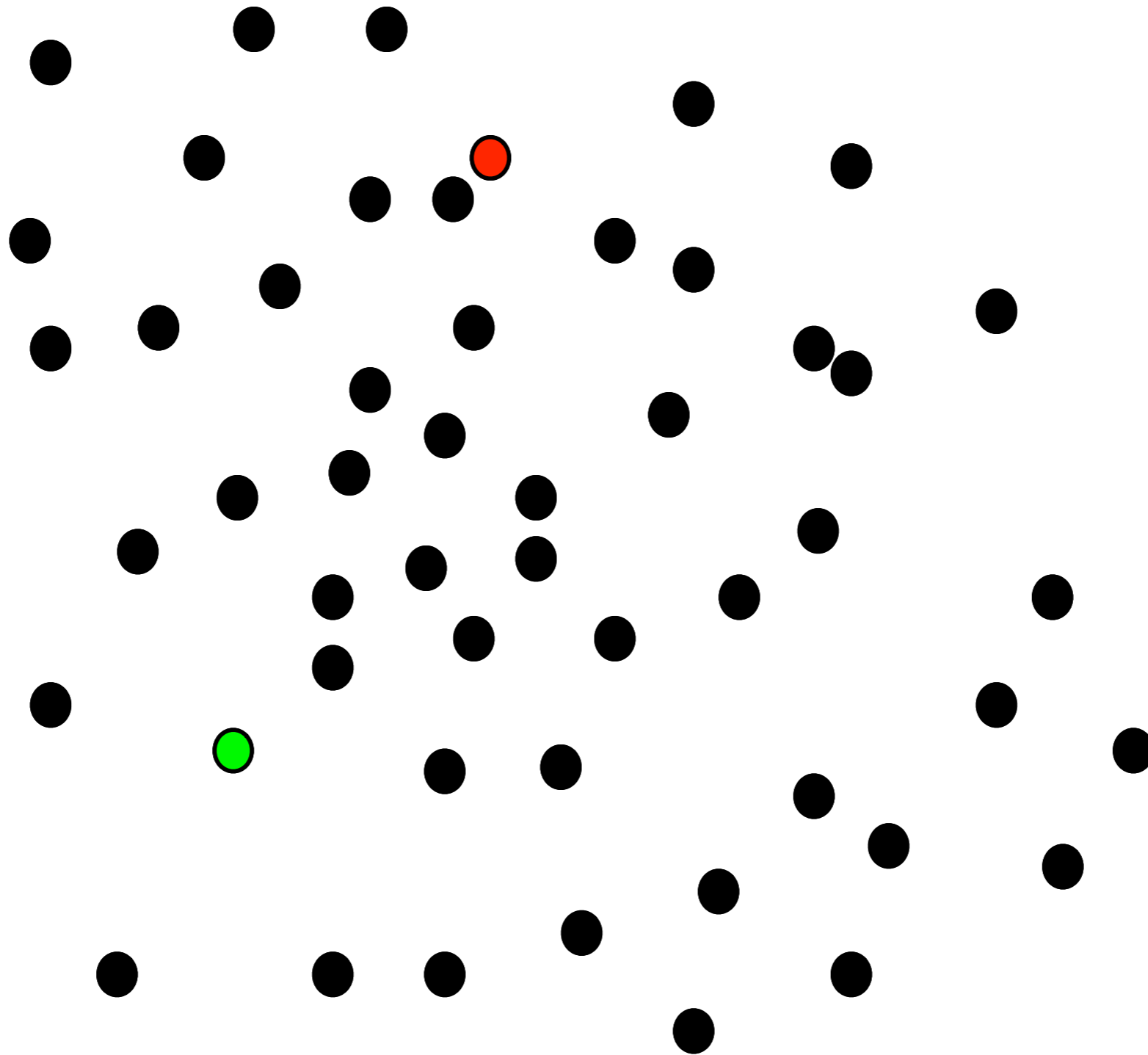
Break

Part II

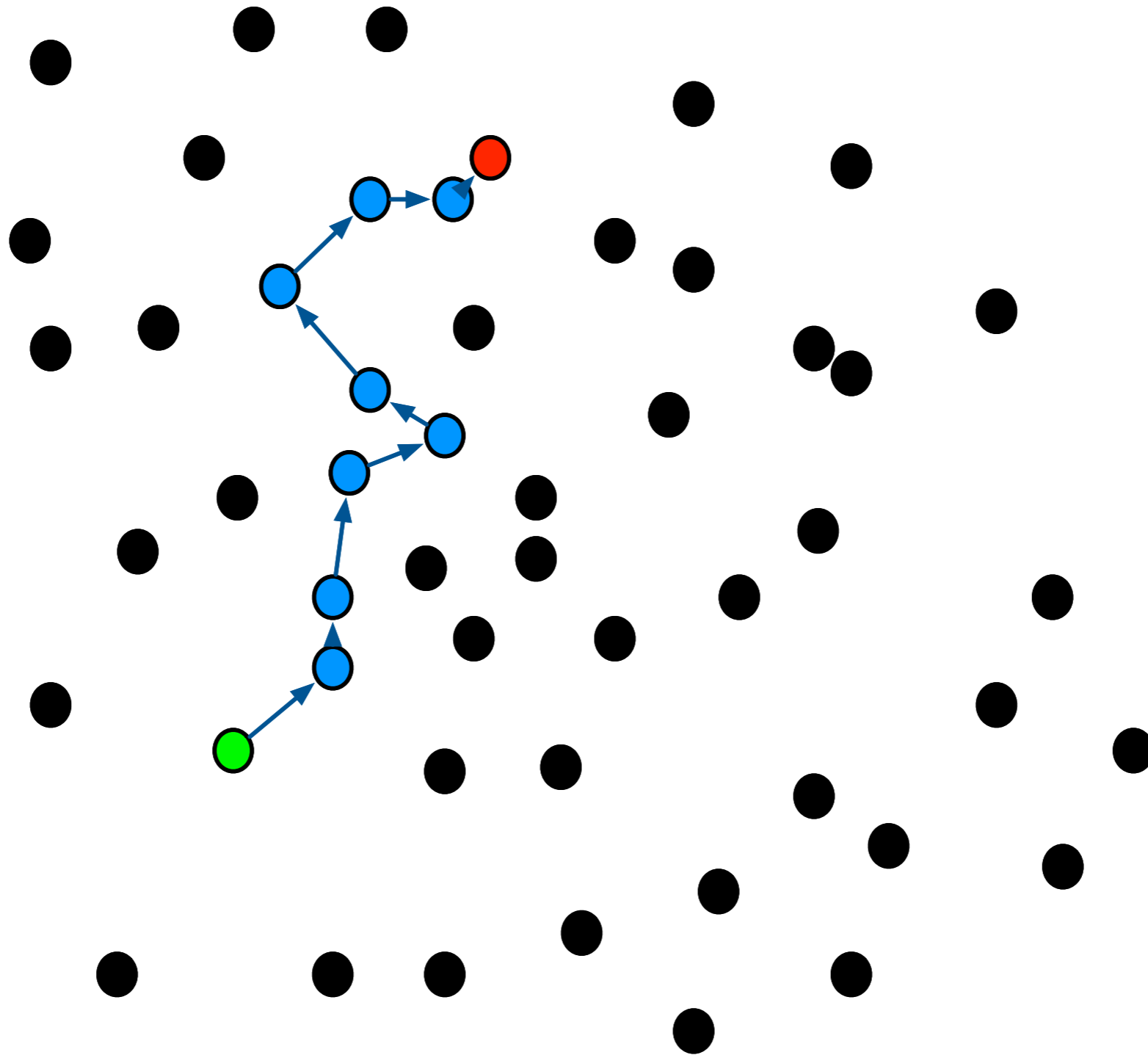
Points-In-Space



Points-In-Space



Points-In-Space



Start-End Timbrel Paths

1. For every song, calculate divergence from select start $(D_{KL}(i, s))$ and end $(D_{KL}(i, e))$ songs
2. Find $d\%$ songs with highest divergence from start song; repeat against end song. Remove songs that appear in both sets.
3. Compute divergent ratio for remaining songs:
$$R(i) = \frac{D_{KL}(i, s)}{D_{KL}(i, e)}$$

Start-End Timbrel Paths

4. Compute ideal step width:

$$step = \frac{R(s) - R(e)}{p + 1}$$

5. Generate ideal positions for each song:

$$\hat{R}(j) = R(s) + j * step$$

6. Select ideal songs that best match the ideal:

$$S_j = \arg \min_{i=1, \dots, m} |\hat{R}(j) - R(i)|$$

Evaluating S-E Paths

objective analysis

- The playlist should contain mostly songs from genres *A* and *B*
- At the beginning of the playlist, most songs should be from genre *A*, at the end from genre *B* and from both genres in the middle

Evaluating S-E Paths

objective analysis

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|------|-----|-------------|
| Sec1 | 33 | 5 | 2 | 15 | 8 | 38 |
| Sec2 | 5 | 1 | 2 | 7 | 4 | 81 |
| Sec3 | 2 | 0 | 3 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|-------------|------|------|-----|-------------|
| Sec1 | 26 | 7 | 2 | 20 | 7 | 38 |
| Sec2 | 6 | 1 | 2 | 7 | 4 | 80 |
| Sec3 | 3 | 0 | 2 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|-------------|-----|------|
| Sec1 | 30 | 5 | 2 | 35 | 8 | 19 |
| Sec2 | 6 | 2 | 3 | 66 | 5 | 18 |
| Sec3 | 2 | 2 | 3 | 70 | 4 | 18 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|------|-------------|------|------------|------|
| Sec1 | 19 | 3 | 8 | 28 | 13 | 29 |
| Sec2 | 17 | 4 | 4 | 20 | 19 | 36 |
| Sec3 | 12 | 3 | 4 | 22 | 16 | 42 |

Evaluating S-E Paths

objective analysis

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|------|-----|-------------|
| Sec1 | 33 | 5 | 2 | 15 | 8 | 38 |
| Sec2 | 5 | 1 | 2 | 7 | 4 | 81 |
| Sec3 | 2 | 0 | 3 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|-------------|------|------|-----|-------------|
| Sec1 | 26 | 7 | 2 | 20 | 7 | 38 |
| Sec2 | 6 | 1 | 2 | 7 | 4 | 80 |
| Sec3 | 3 | 0 | 2 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|-------------|-----|------|
| Sec1 | 30 | 5 | 2 | 35 | 8 | 19 |
| Sec2 | 6 | 2 | 3 | 66 | 5 | 18 |
| Sec3 | 2 | 2 | 3 | 70 | 4 | 18 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|------|-------------|------|------------|------|
| Sec1 | 19 | 3 | 8 | 28 | 13 | 29 |
| Sec2 | 17 | 4 | 4 | 20 | 19 | 36 |
| Sec3 | 12 | 3 | 4 | 22 | 16 | 42 |

Evaluating S-E Paths

objective analysis

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|------|-----|-------------|
| Sec1 | 33 | 5 | 2 | 15 | 8 | 38 |
| Sec2 | 5 | 1 | 2 | 7 | 4 | 81 |
| Sec3 | 2 | 0 | 3 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|-------------|------|------|-----|-------------|
| Sec1 | 26 | 7 | 2 | 20 | 7 | 38 |
| Sec2 | 6 | 1 | 2 | 7 | 4 | 80 |
| Sec3 | 3 | 0 | 2 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|-------------|-----|------|
| Sec1 | 30 | 5 | 2 | 35 | 8 | 19 |
| Sec2 | 6 | 2 | 3 | 66 | 5 | 18 |
| Sec3 | 2 | 2 | 3 | 70 | 4 | 18 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|------|-------------|------|------------|------|
| Sec1 | 19 | 3 | 8 | 28 | 13 | 29 |
| Sec2 | 17 | 4 | 4 | 20 | 19 | 36 |
| Sec3 | 12 | 3 | 4 | 22 | 16 | 42 |

Evaluating S-E Paths

objective analysis

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|------|-----|-------------|
| Sec1 | 33 | 5 | 2 | 15 | 8 | 38 |
| Sec2 | 5 | 1 | 2 | 7 | 4 | 81 |
| Sec3 | 2 | 0 | 3 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|-------------|------|------|-----|-------------|
| Sec1 | 26 | 7 | 2 | 20 | 7 | 38 |
| Sec2 | 6 | 1 | 2 | 7 | 4 | 80 |
| Sec3 | 3 | 0 | 2 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|-------------|-----|------|
| Sec1 | 30 | 5 | 2 | 35 | 8 | 19 |
| Sec2 | 6 | 2 | 3 | 66 | 5 | 18 |
| Sec3 | 2 | 2 | 3 | 70 | 4 | 18 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|------|-------------|------|------------|------|
| Sec1 | 19 | 3 | 8 | 28 | 13 | 29 |
| Sec2 | 17 | 4 | 4 | 20 | 19 | 36 |
| Sec3 | 12 | 3 | 4 | 22 | 16 | 42 |

Evaluating S-E Paths

objective analysis

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|------|-----|-------------|
| Sec1 | 33 | 5 | 2 | 15 | 8 | 38 |
| Sec2 | 5 | 1 | 2 | 7 | 4 | 81 |
| Sec3 | 2 | 0 | 3 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|-------------|------|------|-----|-------------|
| Sec1 | 26 | 7 | 2 | 20 | 7 | 38 |
| Sec2 | 6 | 1 | 2 | 7 | 4 | 80 |
| Sec3 | 3 | 0 | 2 | 4 | 2 | 88 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|-------------|------|------|-------------|-----|------|
| Sec1 | 30 | 5 | 2 | 35 | 8 | 19 |
| Sec2 | 6 | 2 | 3 | 66 | 5 | 18 |
| Sec3 | 2 | 2 | 3 | 70 | 4 | 18 |

| | HiHo | Regg | Funk | Elec | Pop | Rock |
|------|------|------|-------------|------|------------|------|
| Sec1 | 19 | 3 | 8 | 28 | 13 | 29 |
| Sec2 | 17 | 4 | 4 | 20 | 19 | 36 |
| Sec3 | 12 | 3 | 4 | 22 | 16 | 42 |

Evaluating S-E Paths

subjective analysis

- How many outliers are in the playlist which do not fit the overall flavor of the playlist?
- Is the order of songs in the playlist from the start to the end song apparent?

Evaluating S-E Paths

subjective analysis

| Genres | | # of outliers | order apparent | | |
|---------|------|---------------|----------------|----------|-------|
| from | to | | yes | somewhat | no |
| HiHo | Regg | 4.7 | | x | xx |
| HiHo | Funk | 1.7 | xx | x | |
| HiHo | Elec | 1.3 | xxx | | |
| HiHo | Pop | 2.7 | | xx | x |
| HiHo | Rock | 0 | xxx | | |
| Regg | Funk | 0.7 | xx | x | |
| Regg | Elec | 1.3 | xxx | | |
| Regg | Pop | 1.3 | xxx | | |
| Regg | Rock | 0.3 | xx | | x |
| Funk | Elec | 1.0 | xx | x | |
| Funk | Pop | 1.7 | xx | | x |
| Funk | Rock | 0 | xx | x | |
| Elec | Pop | 0 | xxx | | |
| Elec | Rock | 0 | xx | x | |
| Pop | Rock | 0 | xxx | | |
| average | | 1.1 | 71.1% | 17.8% | 11.1% |

Evaluating S-E Paths

subjective analysis

| Genres | | # of outliers | order apparent | | |
|---------|------|---------------|----------------|----------|-------|
| from | to | | yes | somewhat | no |
| HiHo | Regg | 4.7 | | x | xx |
| HiHo | Funk | 1.7 | xx | x | |
| HiHo | Elec | 1.3 | xxx | | |
| HiHo | Pop | 2.7 | | xx | x |
| HiHo | Rock | 0 | xxx | | |
| Regg | Funk | 0.7 | xx | x | |
| Regg | Elec | 1.3 | xxx | | |
| Regg | Pop | 1.3 | xxx | | |
| Regg | Rock | 0.3 | xx | | x |
| Funk | Elec | 1.0 | xx | x | |
| Funk | Pop | 1.7 | xx | | x |
| Funk | Rock | 0 | xx | x | |
| Elec | Pop | 0 | xxx | | |
| Elec | Rock | 0 | xx | x | |
| Pop | Rock | 0 | xxx | | |
| average | | 1.1 | 71.1% | 17.8% | 11.1% |

Evaluating S-E Paths

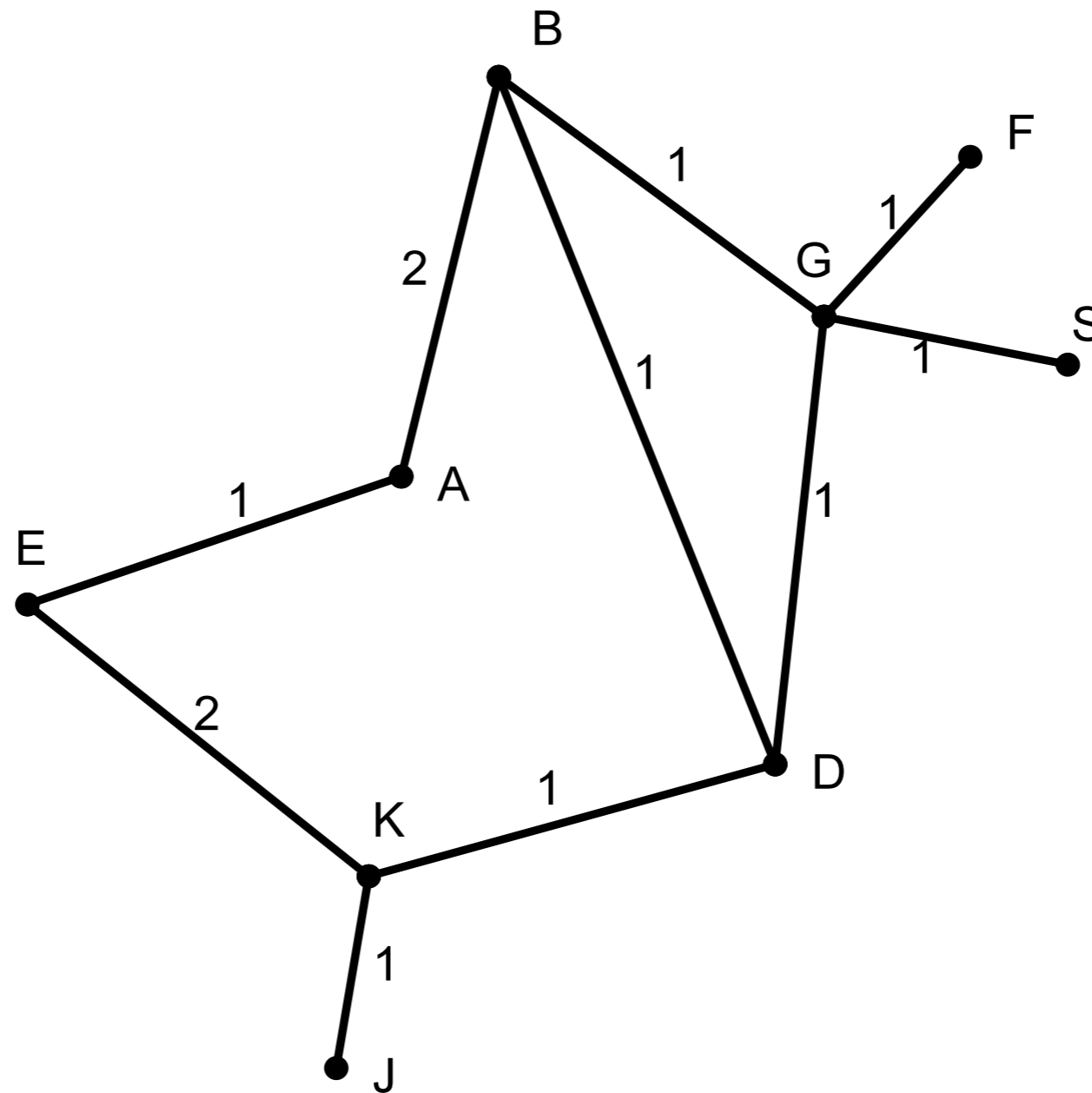
subjective analysis

| Genres | | # of outliers | order apparent | | |
|---------|------|---------------|----------------|----------|-------|
| from | to | | yes | somewhat | no |
| HiHo | Regg | 4.7 | | x | xx |
| HiHo | Funk | 1.7 | xx | x | |
| HiHo | Elec | 1.3 | xxx | | |
| HiHo | Pop | 2.7 | | xx | x |
| HiHo | Rock | 0 | xxx | | |
| Regg | Funk | 0.7 | xx | x | |
| Regg | Elec | 1.3 | xxx | | |
| Regg | Pop | 1.3 | xxx | | |
| Regg | Rock | 0.3 | xx | | x |
| Funk | Elec | 1.0 | xx | x | |
| Funk | Pop | 1.7 | xx | | x |
| Funk | Rock | 0 | xx | x | |
| Elec | Pop | 0 | xxx | | |
| Elec | Rock | 0 | xx | x | |
| Pop | Rock | 0 | xxx | | |
| average | | 1.1 | 71.1% | 17.8% | 11.1% |

Playlist Similarity

- The co-occurrence of objects in an **authored stream** can be used as a proxy for object similarity
- This sort of similarity is especially effective for the generation of playlists
- Employs the use of an undirected graph, weighted by co-occurrence counts

Playlist Similarity



Playlist Similarity

example playlists

| | |
|---|--------|
| Paperback Writer [Beatles] | 0.0 |
| Breakfast In America [Supertramp] | 8.607 |
| We're An American Band [Grand Funk Rrd] | 8.607 |
| In The Dark [Billy Squier] | 17.244 |
| I Shot The Sheriff [Eric Clapton] | 12.192 |
| Fat Bottomed Girls [Queen] | 16.335 |
| Jumpin' Jack Flash [Rolling Stones] | 13.723 |
| Working For The Weekend [Loverboy] | 15.251 |
| Dream Weaver [Gary Wright] | 15.520 |
| Smells Like Teen Spirit! [Nirvana] | 15.735 |
| Can't Stop [Red Hot Chili Peppers] | 16.732 |
| Still Waiting [Sum 41] | 19.256 |
| Grave Digger [Dave Matthews] | 20.665 |

| | |
|---|--------|
| Lithium [Nirvana] : 0.0 | |
| Fall To Pieces [Velvet Revolver] | 7.668 |
| Tonight, Tonight [Smashing Pumpkins] | 12.712 |
| Slow Hands [Interpol] | 12.712 |
| Renegades Of Funk [Rage Against...] | 10.127 |
| Before I Forget [Slipknot] | 7.355 |
| The Kids Aren't Alright [Offspring] | 11.712 |
| All These Things That I've Done [Killers] | 9.542 |
| Weapon [Matthew Good] | 18.914 |
| Kryptonite [3 Doors Down] | 11.127 |
| Home [Three Days Grace] | 8.712 |
| Whatever [Godsmack] | 10.127 |
| Colors [Crossfade] | 7.097 |

Playlist Similarity

example similarities

| | | | |
|---|-------|--|-------|
| Hey Jude [Beatles] | 0.000 | Highway To Hell [AC/DC] | 0.000 |
| Lady Madonna [Beatles] | 7.515 | Best Of You [Foo Fighters] | 6.252 |
| Lucy In The Sky With Diamonds [Beatles] | 7.515 | Remedy [Seether] | 6.362 |
| Peace Of Mind [Boston] | 7.737 | Right Here [Staind] | 6.362 |
| (Just Like) Starting Over [John Lennon] | 7.737 | Holiday [Green Day] | 6.362 |
| Saturday In The Park [Chicago] | 8.000 | Be Yourself [Audioslave] | 6.558 |
| Shine It All Around [Robert Plant] | 8.000 | The Hand That Feeds [Nine Inch Nail s] | 6.584 |
| Holiday [Green Day] | 8.000 | B.Y.O.B. [System Of A Down] | 6.754 |
| Rock And Roll Heaven [Righteous Brothers] | 8.000 | Happy? [Mudvayne] | 6.847 |
| | | Shine It All Around [Robert Plant] | 6.982 |

Playlist Steering

- Create a timbral features
- Create the space using tuple and triple n-gram sequences from playlist logs
- Generate playlists via tag steering

Playlist Steering

1. Select a seed track
2. Threshold transition matrix to generate set of possible next tracks
3. User creates a tag cloud, assigning weights to any of 360 tags
4. Autotagger creates tag cloud for all candidate tracks selected in (2). Cosine distance is taken between the user's tag cloud and each song's.
5. The track with the minimum cosine distance from seed is played

Playlist Steering

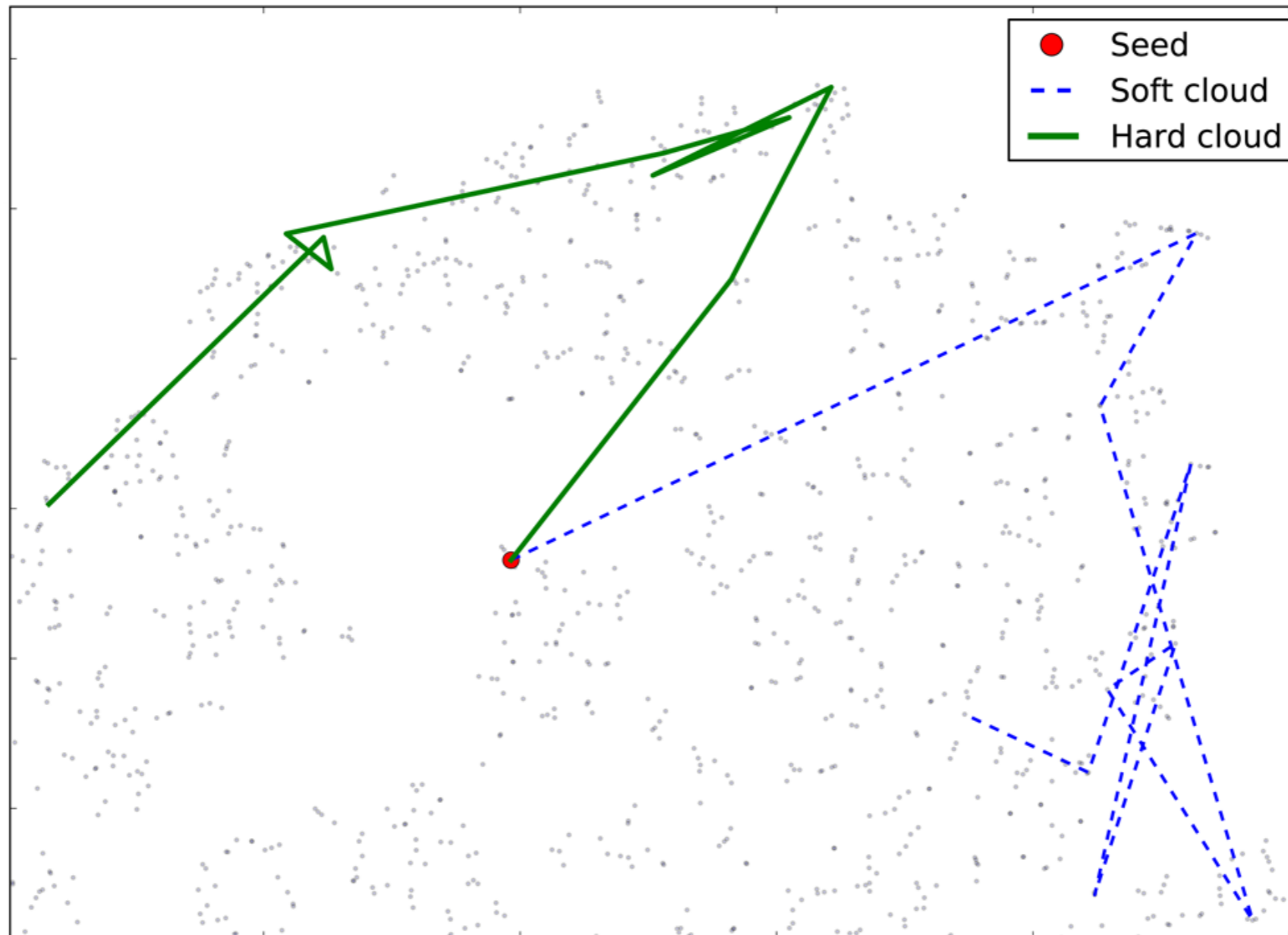
Soft tag cloud

Viva la Vida by Coldplay
Wish You Were Here by Pink Floyd
Peaceful, Easy Feeling by Eagles
With or Without You by U2
One by U2
Fields Of Gold by Sting
Every Breath You Take by The Police
Gold Dust Woman by Fleetwood Mac
Enjoy The Silence by Depeche Mode

Hard tag cloud

All I Want by Staind
Re-Education (Through Labor) by Rise Against
Hammerhead by The Offspring
The Kill by 30 Seconds To Mars
When You Were Young by The Killers
Hypnotize by System of a Down
Breath by Breaking Benjamin
My Hero by Foo Fighters
Turn The Page by Metallica

Playlist Steering



Scaling up playlisting

Scaling up playlist generation

- Building playlists involves satisfying constraints.
 - Global constraints: no duplicate songs, tempo between 120 and 130 BPM
 - Ordering constraints: no consecutive artists, DMCA rules
 - Sorting constraints: ordered by danceability and loudness
 - Playlist length: 15 songs, 32 minutes, < 20mb
- Finite constraint satisfaction problem. It's NP-HARD

General Approach

- Playlist is a sequence of songs: $S_1, S_2 \dots S_n$ drawn from a large pool of songs
- $\text{Cost}(S_n, C)$ is how well song S at position N satisfies constraint C
- $\text{Cost}(S_n)$ is total cost for song S at position N for all constraints
- $\text{Cost}(P)$ is total cost of all songs in the Playlist
- Goal: **Find $S_1, \dots S_n$ that minimizes $\text{Cost}(P)$**



Scaling up playlist generation

Generate random playlist

while $\text{Cost}(P) > \text{threshold}$:

 Calculate $\text{Cost}(S_n)$ for each song

 find $\max(\text{Cost}(S_n))$ that is not tabu

 find best possible replacement

worst variables for which no value can be found to decrease the total cost are labelled as **tabu** for a given number of iterations.

Typical runtime: 1.4 seconds for 10 song playlist from a pool of 20,000 songs with 10 constraints



Fast Generation of Optimal Music Playlists using Local Search

- Simulated annealing
- Heuristic improvements
 - Song domain reduction
 - Two level search:
 1. Replace, Insert, Delete
 2. Swap
- Partial constraint voting

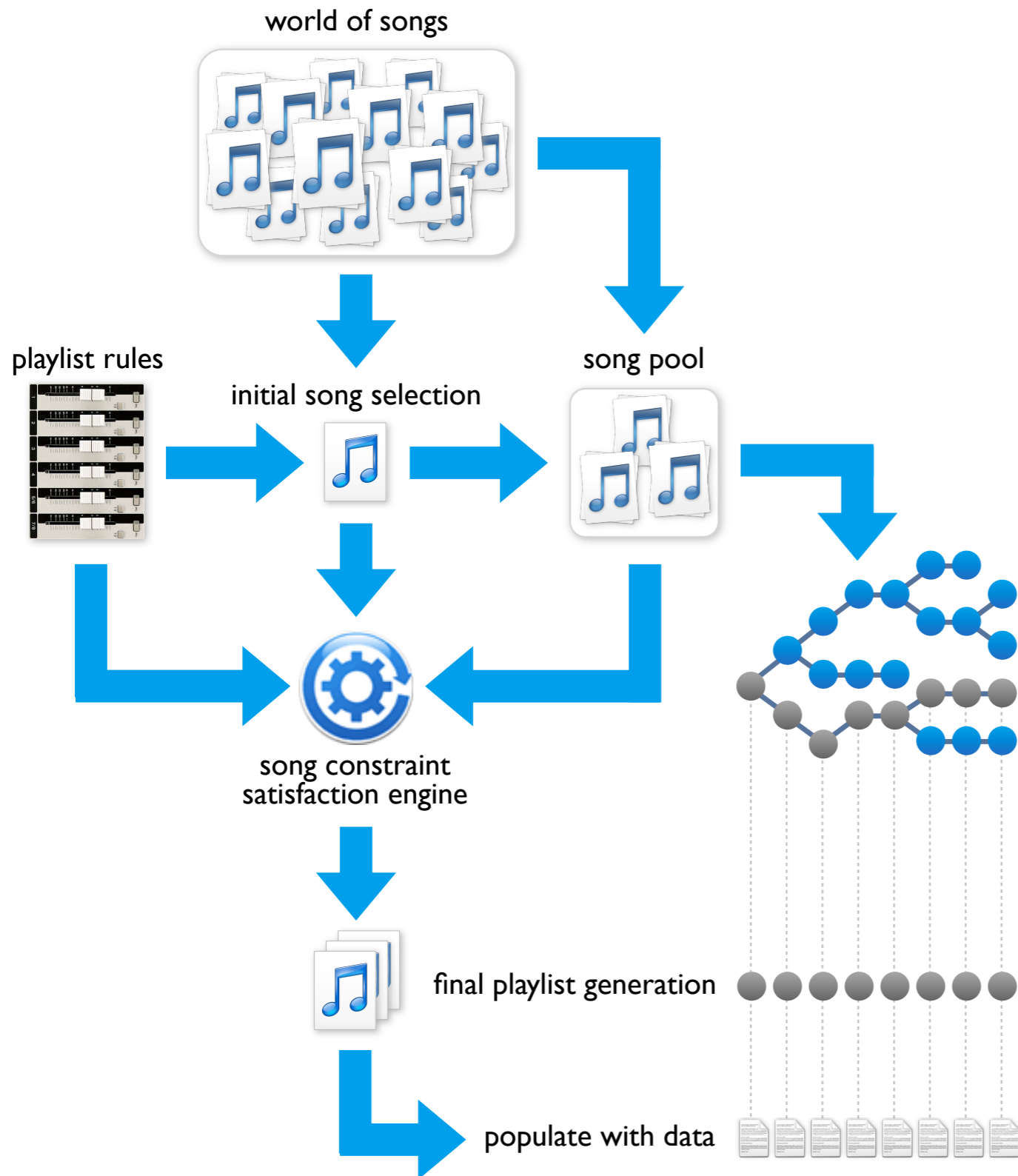
```
INITIALIZE  $p, t_0, L_0$ ;  
 $h := 0$ ;  
 $r := 0$ ;  
repeat  
  for  $l := 1$  to  $L_h$  do  
    begin  
      if  $r < \beta$  then  
        begin  
          if  $\delta > \text{random}[0, 1)$  then  
            GENERATE RANDOM  $p' \in N_{\text{reselect}}(p)$   
          else  
            GENERATE  $p' \in N_{\text{reselect}}(p)$  BY VOTING;  
          if  $f(p') \leq f(p)$  or  $\exp(\frac{f(p)-f(p')}{t}) > \text{random}[0, 1)$   
            then  $p := p'$ ;  
             $r := r + 1$   
          end  
        else begin  
           $p := \text{NDR}(p, \gamma)$ ;  
           $r := 0$   
        end  
      end;  
     $h := h + 1$ ;  
    CALCULATE LENGTH  $L_h$ ;  
    CALCULATE CONTROL  $t_h$   
until STOP CRITERION
```

Fast Generation of Optimal Music Playlists using Local Search

- Start at high temperature
- Repeat until stop criterion:
 - Alternate - 100 at a time:
 - Level 1:
 - Select **Replace**, **Insert** or **Delete** operation by **voting** or **random**
 - Create new playlist by applying the operation
 - Accept the change if:
 - It lowers the overall cost *or*
 - Randomly when at high temperatures
 - Lower the temperature
 - Level 2:
 - Non-deteriorating **swap**

Typical runtime: 2 seconds for 14 song playlist with 15 constraints from a pool of 2,000 songs

The Echo Nest playlister

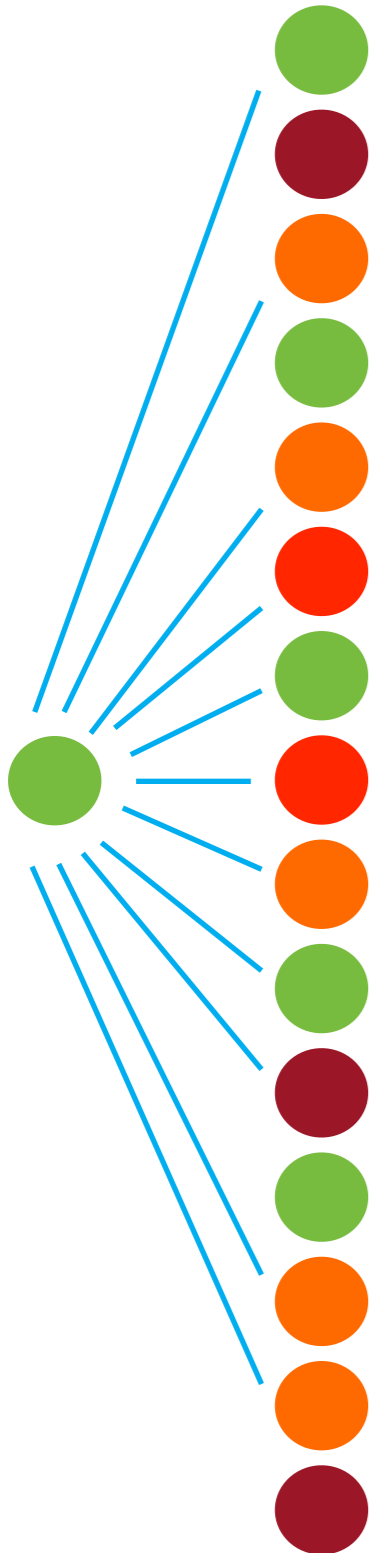


- Start with millions of songs
- Apply global constraints to create smaller song pool (1K to 10K songs)
- Use constraint engine to find best playlist:
 - Beam search
 - Adaptive search
- Populate with data

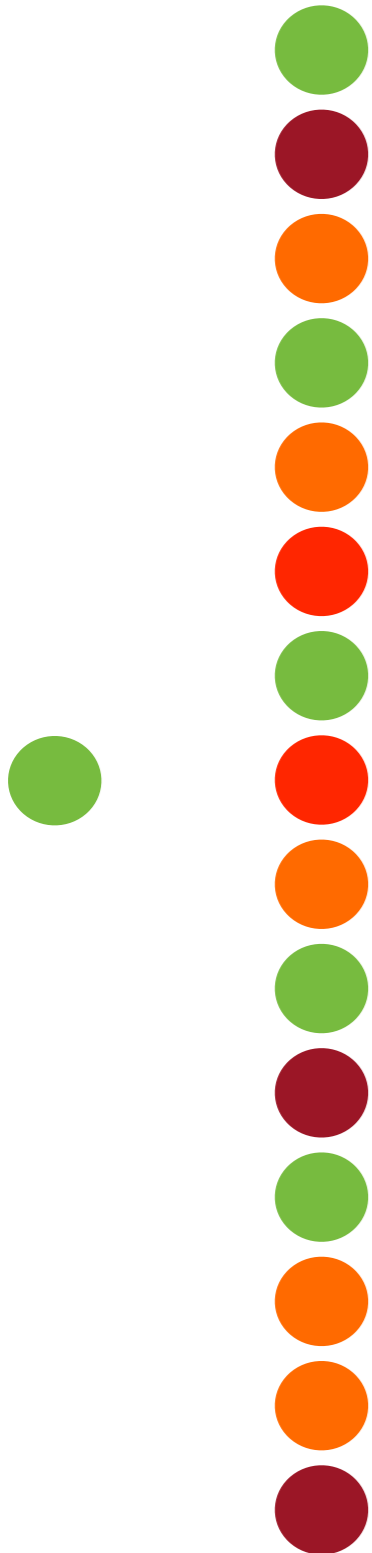
Beam Search



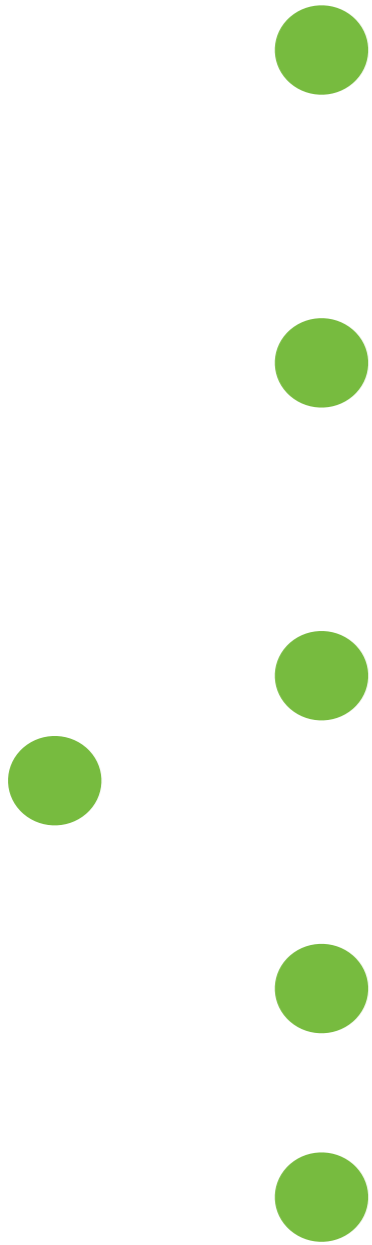
Beam Search



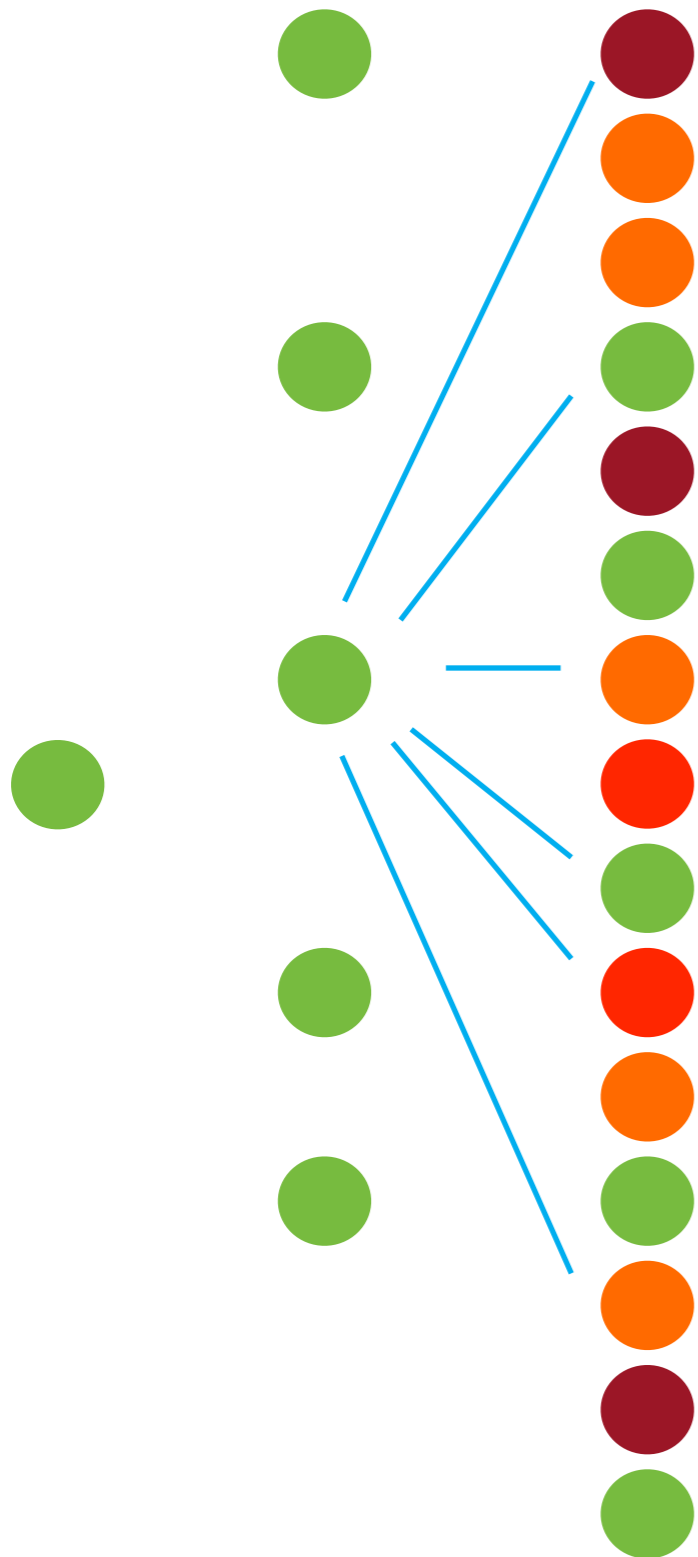
Beam Search



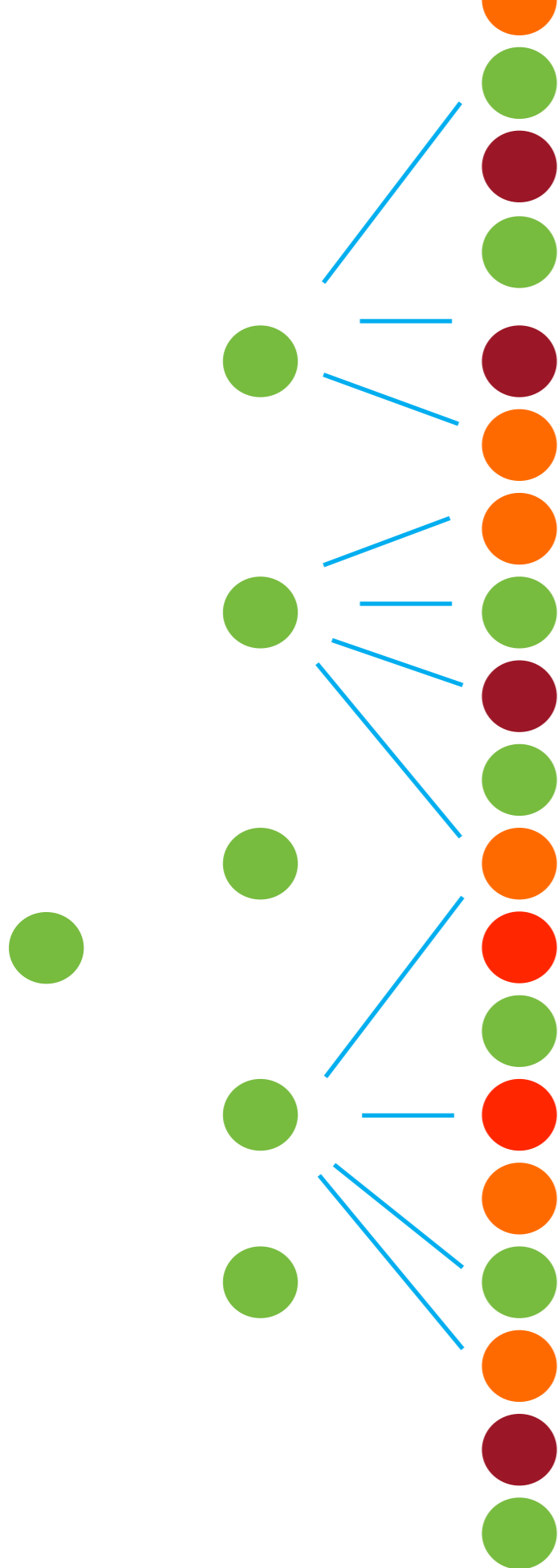
Beam Search



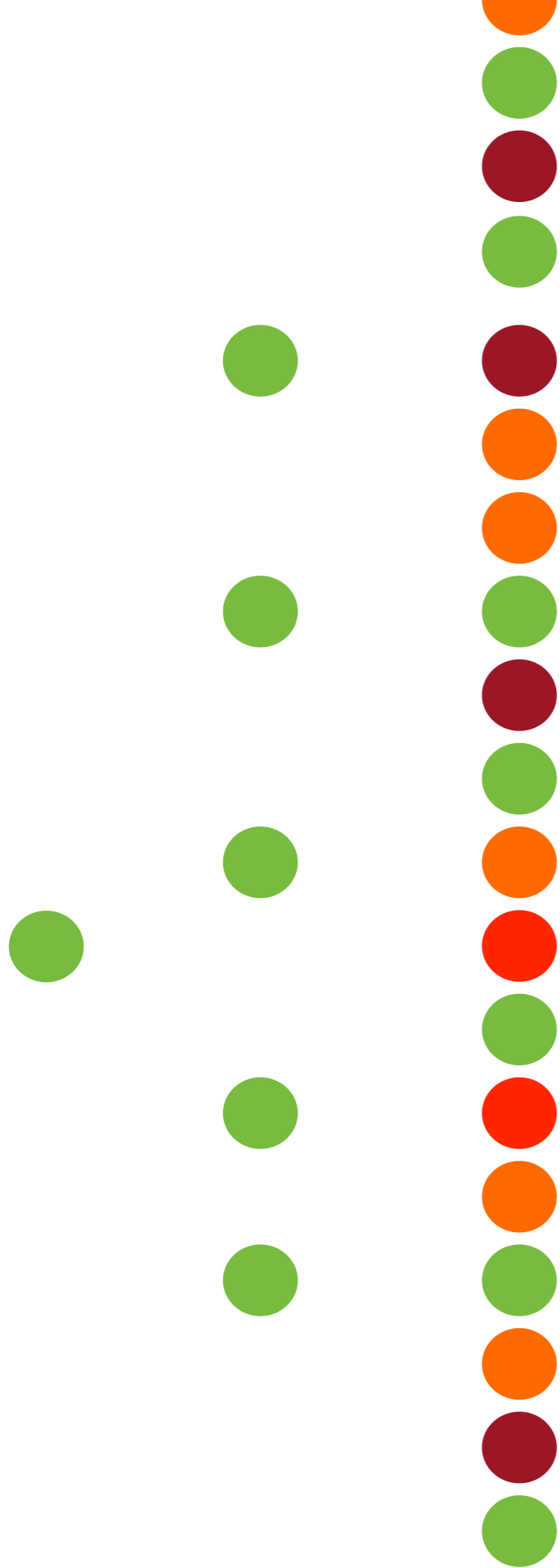
Beam Search



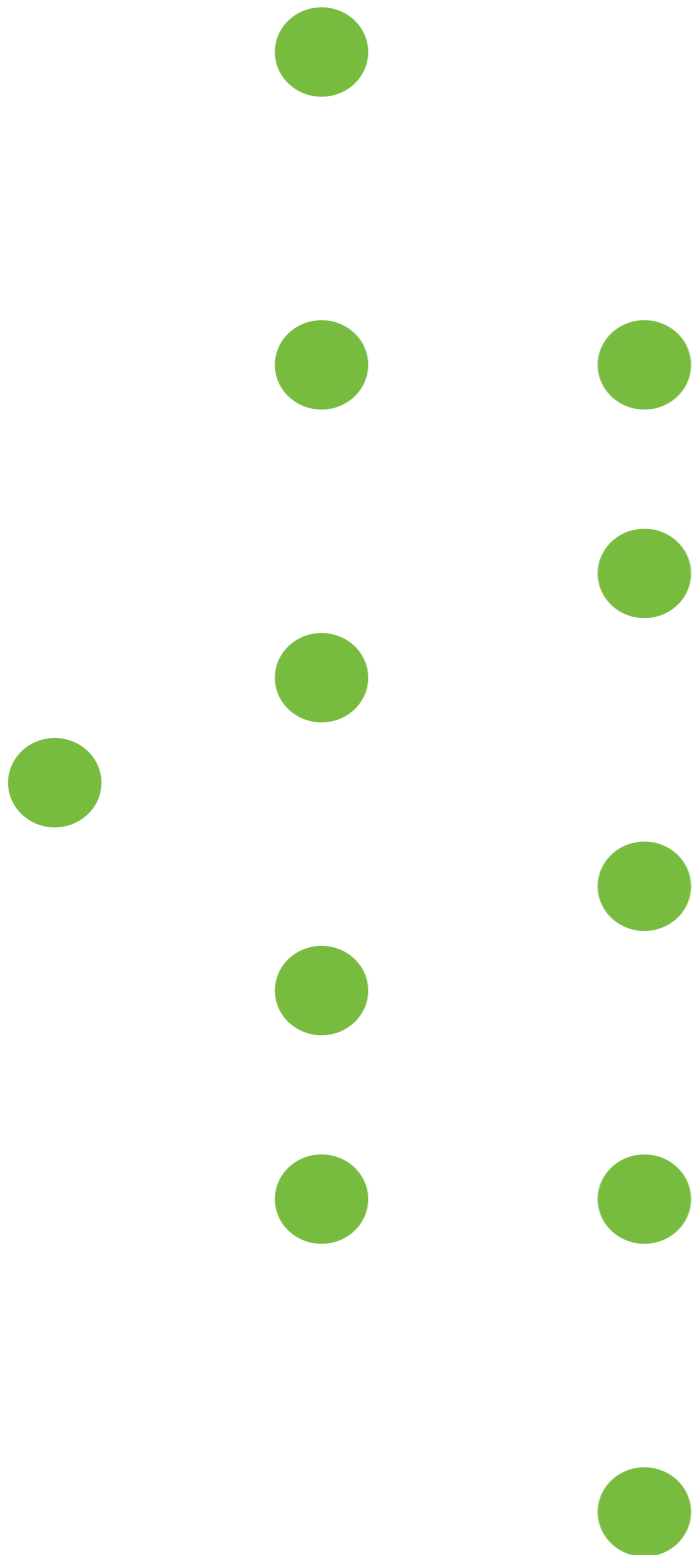
Beam Search



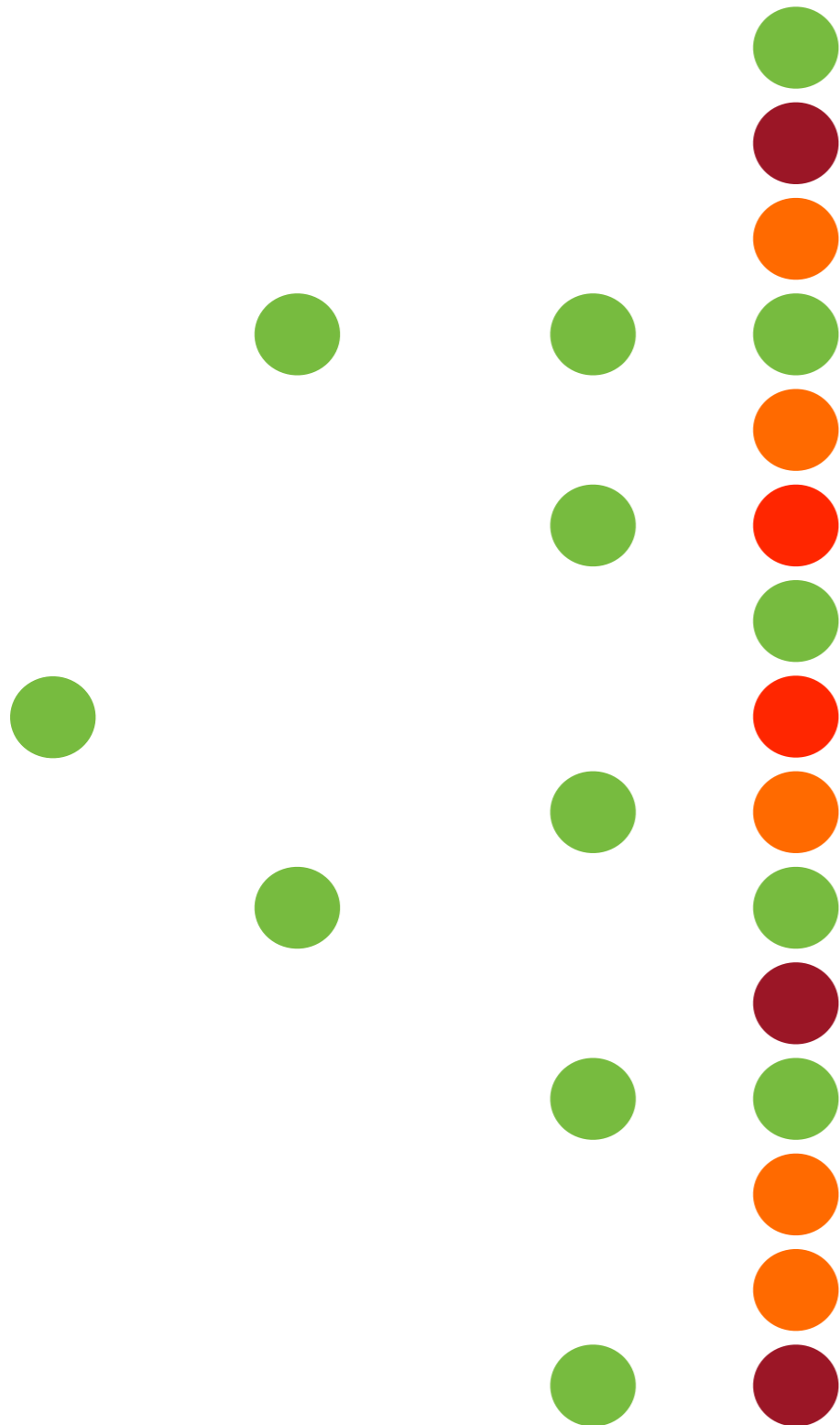
Beam Search



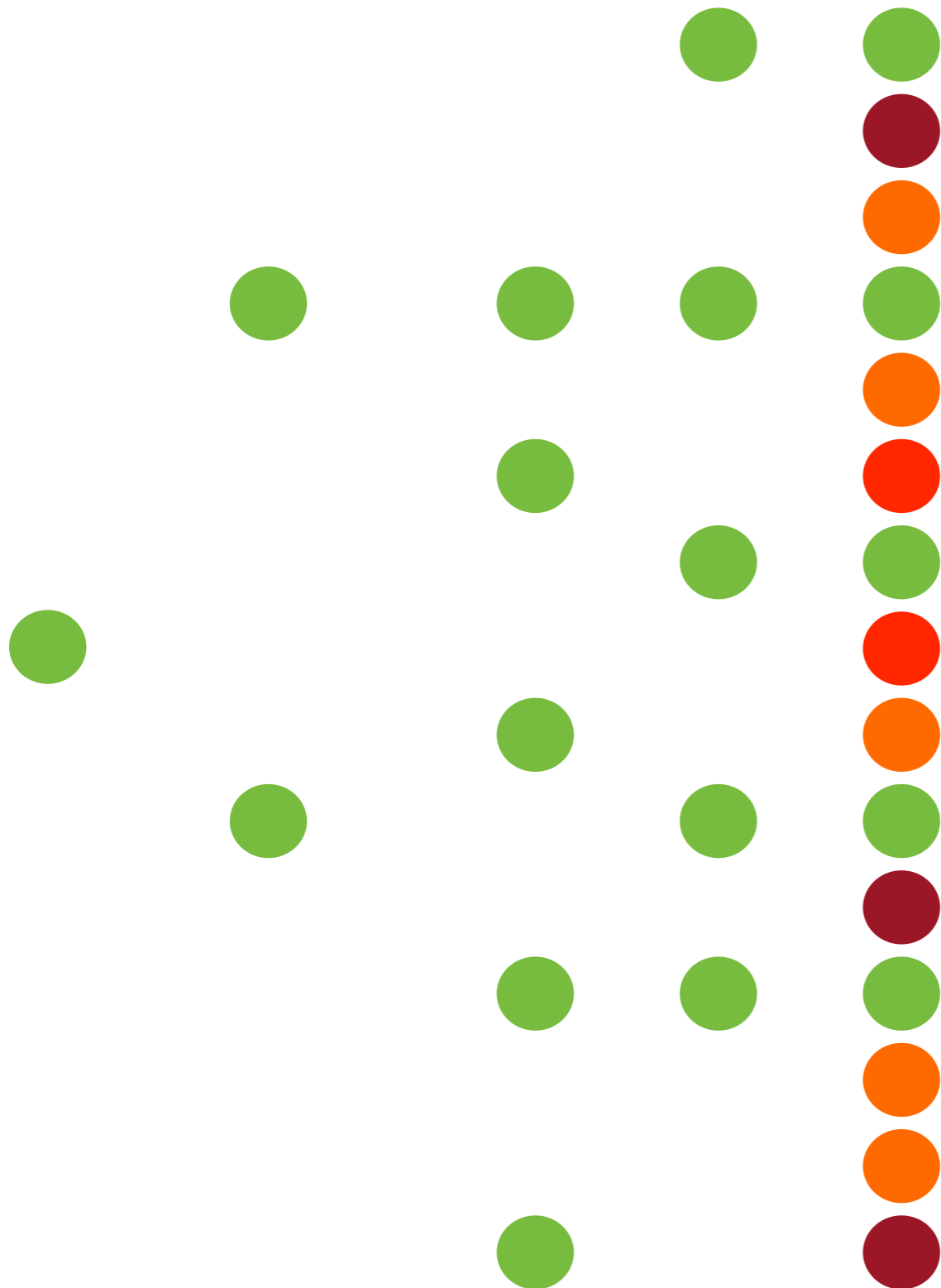
Beam Search



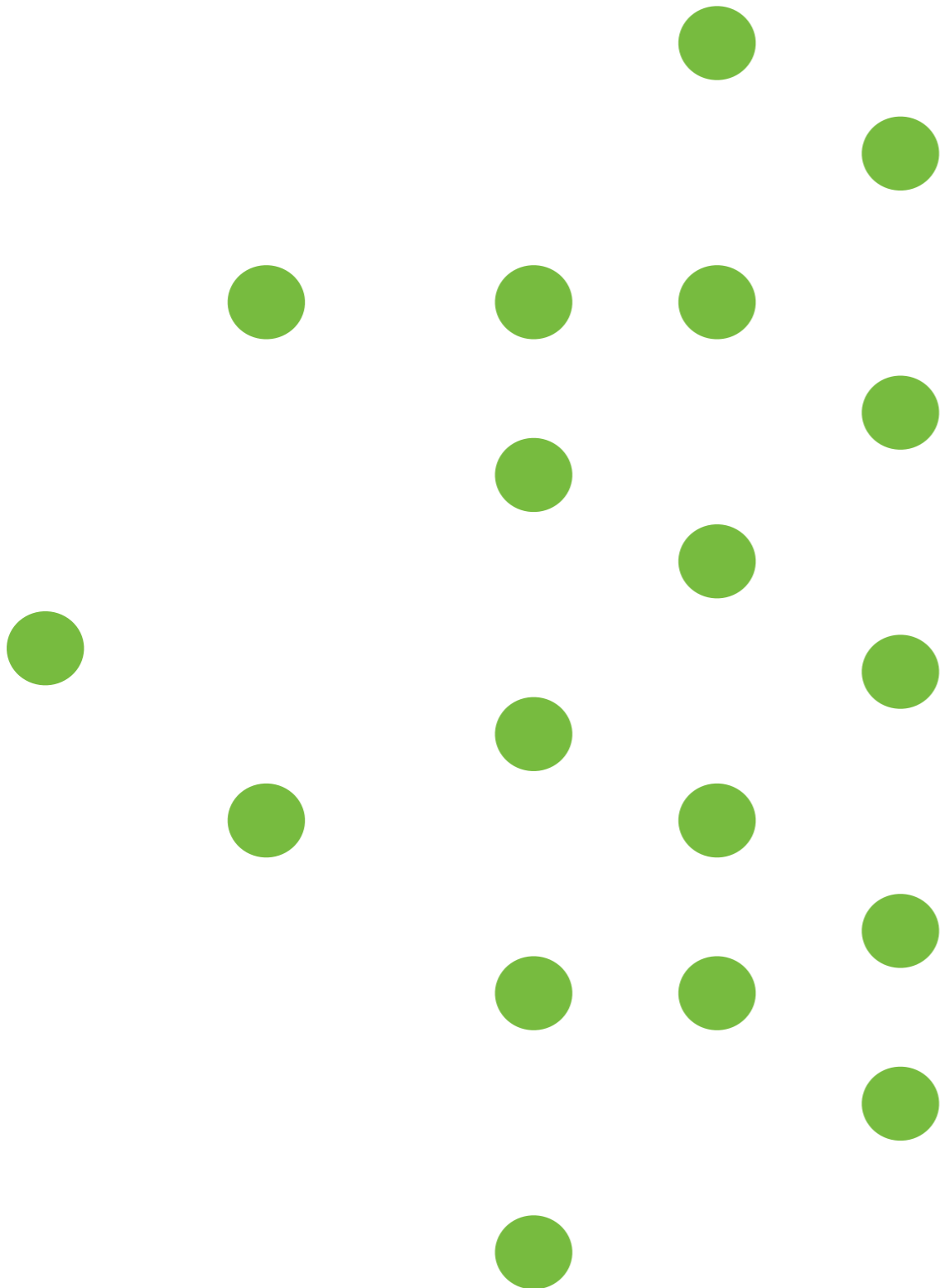
Beam Search



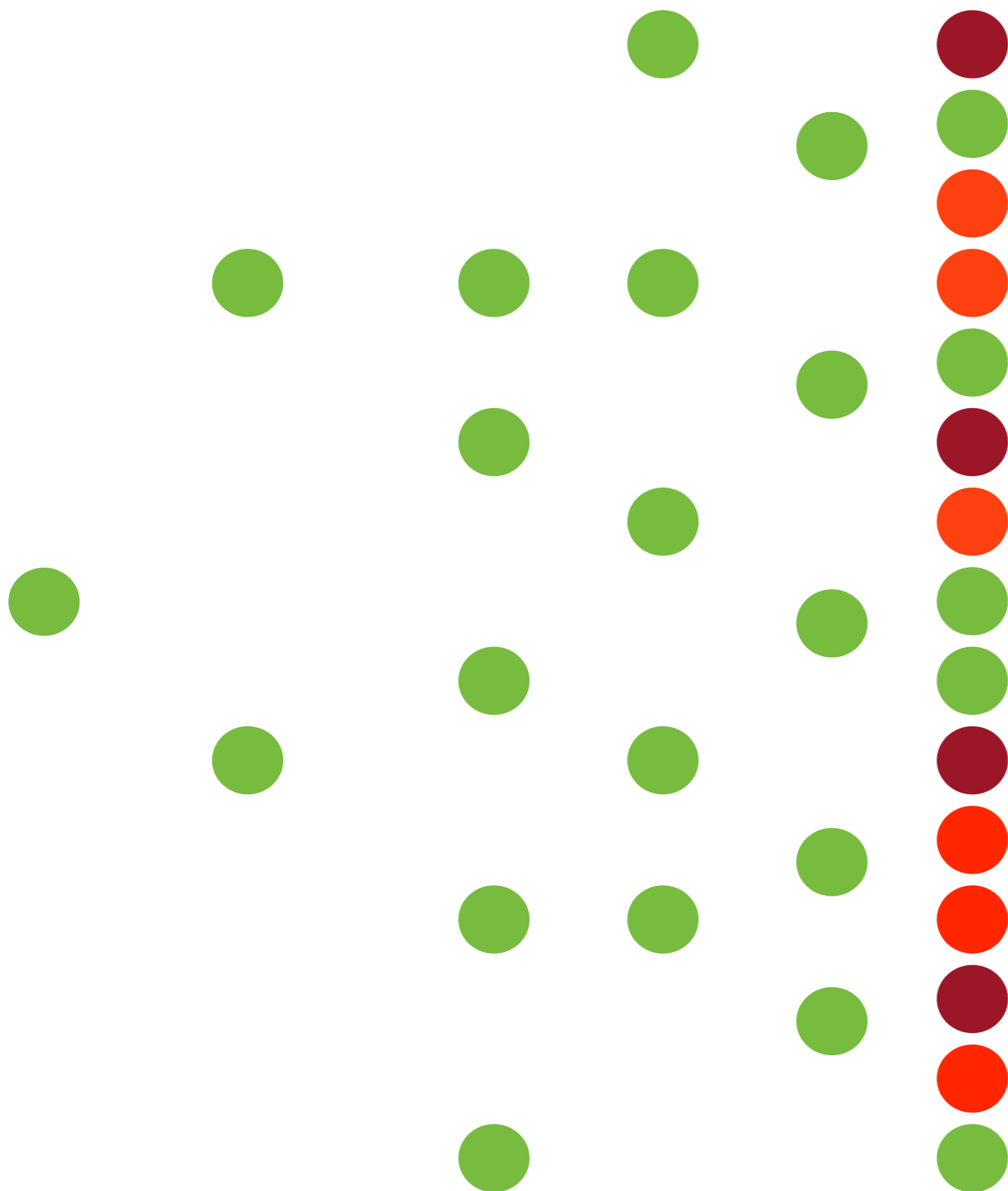
Beam Search



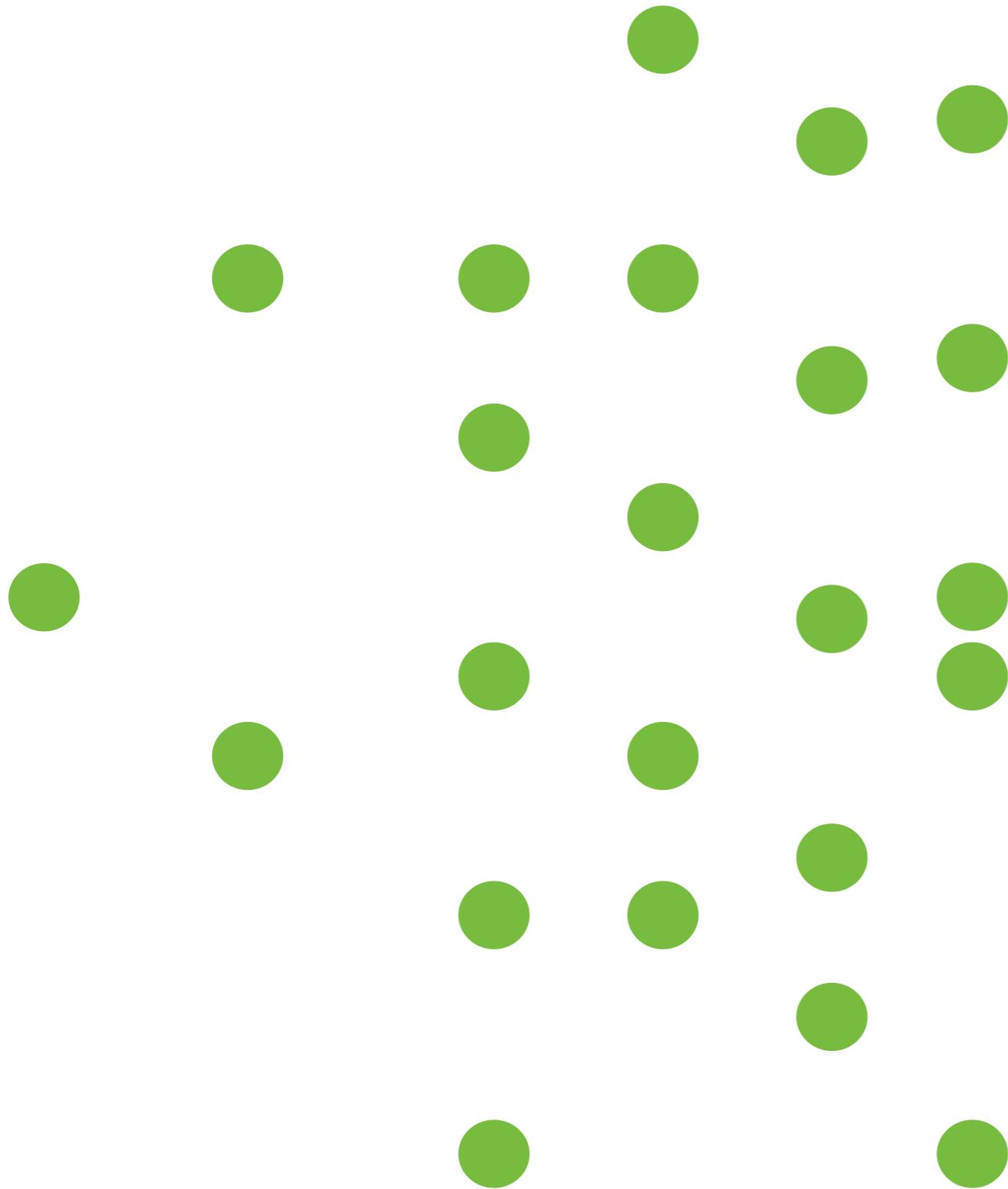
Beam Search



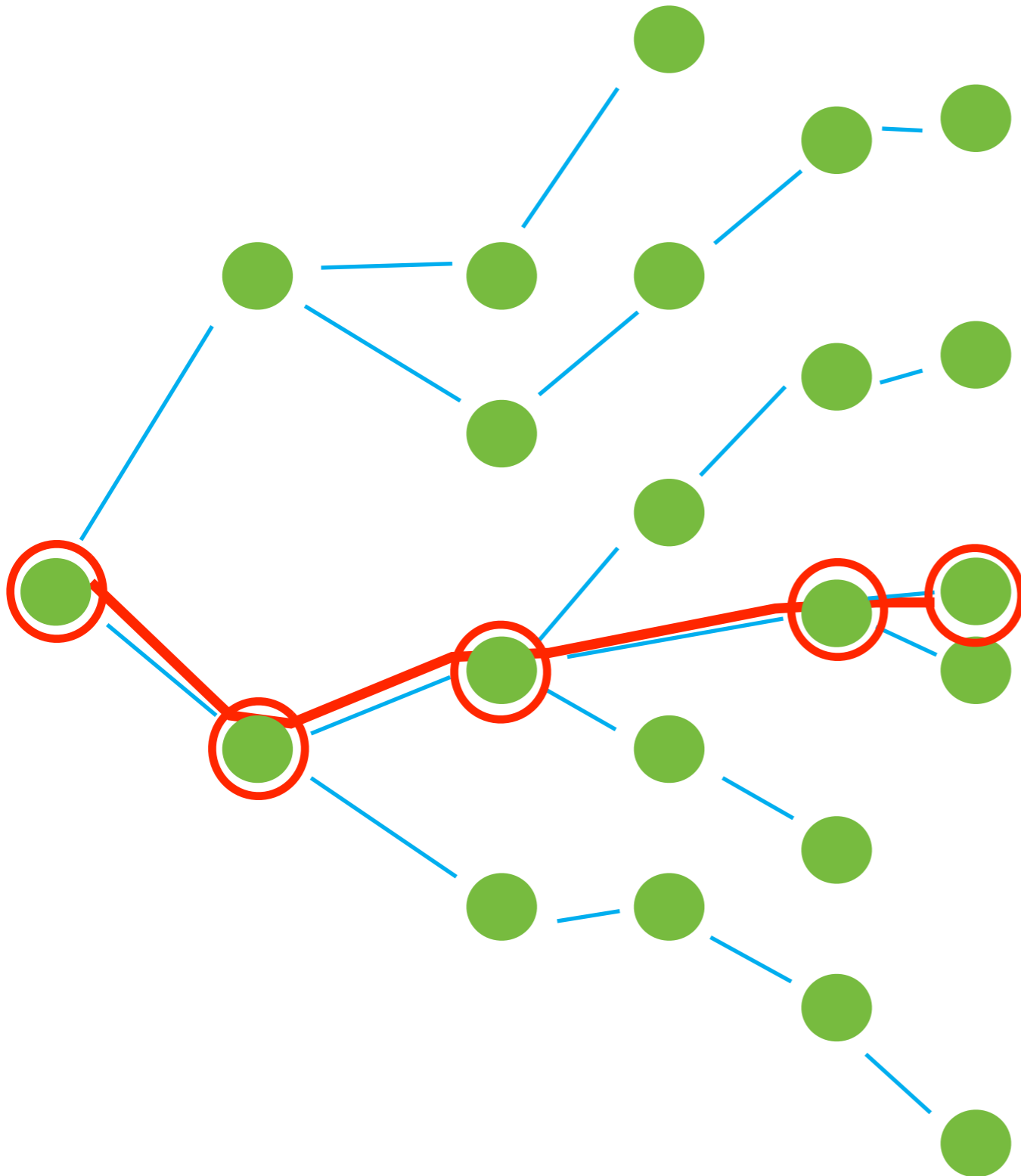
Beam Search



Beam Search



Beam Search






Group Playlisting

- Group playlisting:
 - Radio, Clubs, Offices, Health Clubs, The Web
- Group playlisting challenges:
 - Varying and conflicting music tastes
 - Different levels of assertiveness
- Traditional:
 - Dictator, Compromise
 - Random, Opt-out




Group cost functions

- New cost functions for group playlisting - **social cost function:**
 - Average happiness - group vote of members
 - Maximum happiness - vote of the happiest group member
 - Minimum misery - vote of the least happy




Group costs

| | Ben | Paul | Oscar |
|---|-----|------|-------|
|  | 2 | 10 | 1 |
|  | 4 | 3 | 3 |
|  | 6 | 2 | 7 |

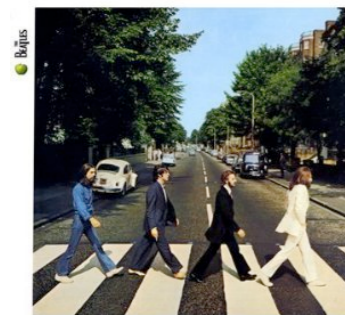
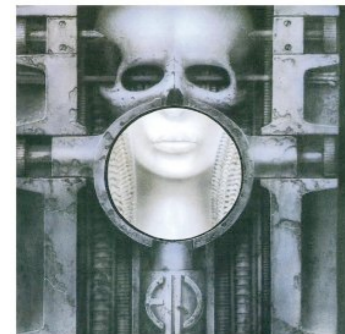
Group costs

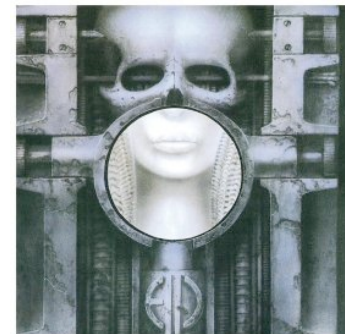

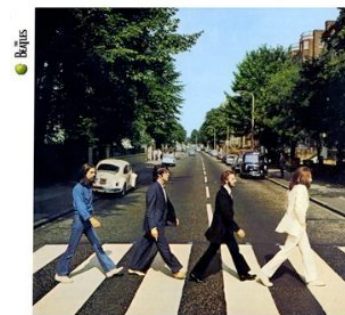
| | Ben | Paul | Oscar | Avg |
|---|-----|------|-------|------|
|  | 2 | 10 | 1 | 4.33 |
|  | 4 | 3 | 3 | 3.33 |
|  | 6 | 2 | 7 | 5 |

Group costs

| | Ben | Paul | Oscar | Avg | Max |
|---|-----|------|-------|------|-----|
|  | 2 | 10 | 1 | 4.33 | 10 |
|  | 4 | 3 | 3 | 3.33 | 4 |
|  | 6 | 2 | 7 | 5 | 6 |

Group costs



| | Ben | Paul | Oscar | Avg | Max | Min |
|---|-----|------|-------|------|-----|-----|
|  | 2 | 10 | 1 | 4.33 | 10 | 1 |
|  | 4 | 3 | 3 | 3.33 | 4 | 3 |
|  | 6 | 2 | 7 | 5 | 6 | 2 |



Flytrap

- Uses simple voting mechanism - ‘average happiness’
- Each listener agent votes:
 - Artist previously listened == high votes
 - Genre previous listened == positive vote
- Songs with more votes have higher probability of being played
- Never play 2 songs by same artist in a row
- Loose coherence of genre across tracks

Flycasting

1. Translate the request histories of all requesters into ratings for artists.
2. Predict ratings for each artist that a requester has never requested.
3. Determine what artists are the most popular among the listening audience.
4. Determine what artists are similar to the final artist on the playlist.
5. Select a song to play that is performed by an artist that is both popular among the listening requesters and similar to the artist that precedes it.

How to Combine Different Individual Preferences

The goal of the Reuse Process is to *combine* different individual preferences into a global **group ranking** of the candidate songs

I Spy (Pulp)

retrieved candidates

Lazy (Suede)

Go (Moby)

Uno (Muse)

Drive (R.E.M.)

Ex.: three listeners have diverging individual preferences over which candidate song to play after *I Spy* (Pulp)

0.9

0

-0.7

0.2

0.6

-1

-0.3

0.2

0.0

0.9

1

0.2

?

?

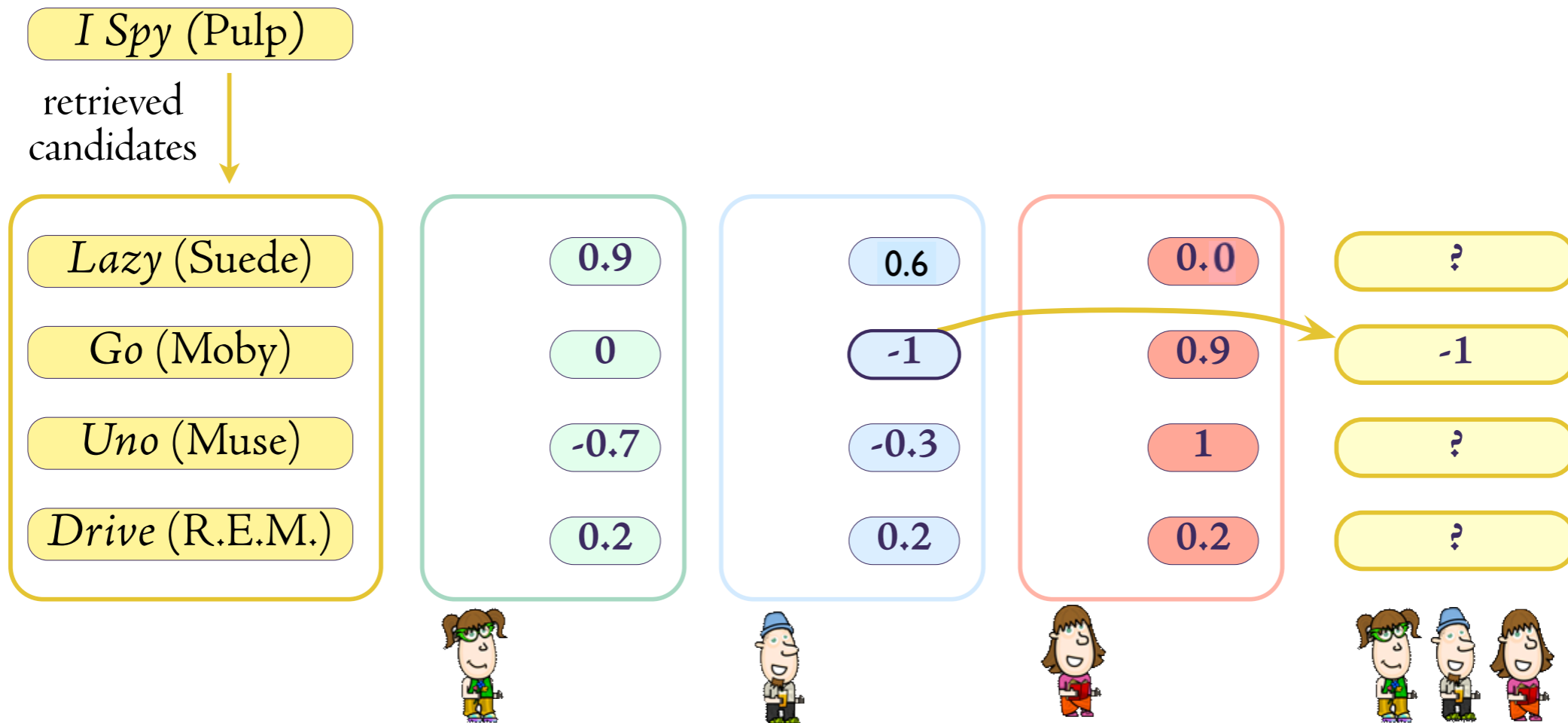
?

?



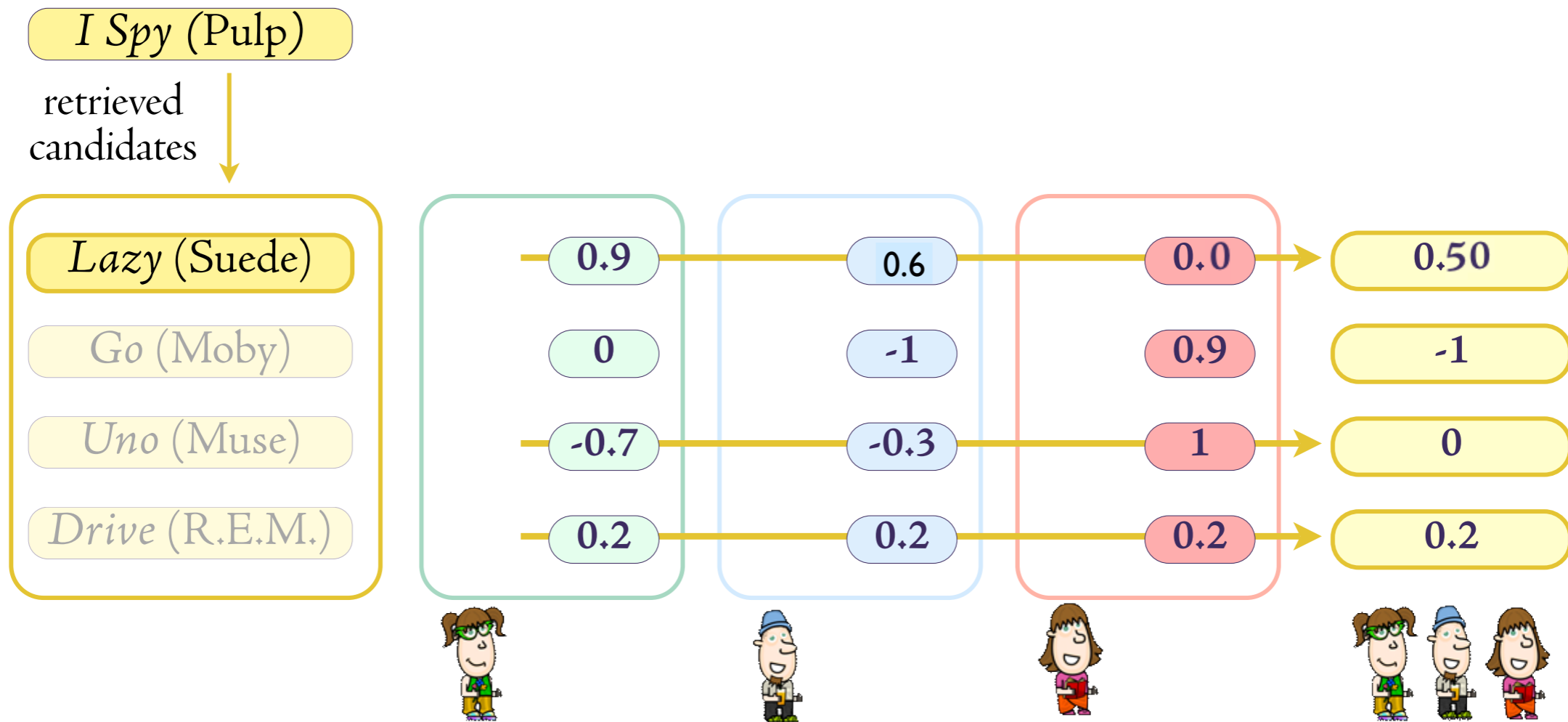
How to Combine Different Individual Preferences

1. To **avoid misery**, any candidate song that is **hated** by some listener automatically gets the lowest group preference degree



How to Combine Different Individual Preferences

2. To ensure **fairness**, the group preference degree of the remaining candidates equals to the **average** of the individual preferences



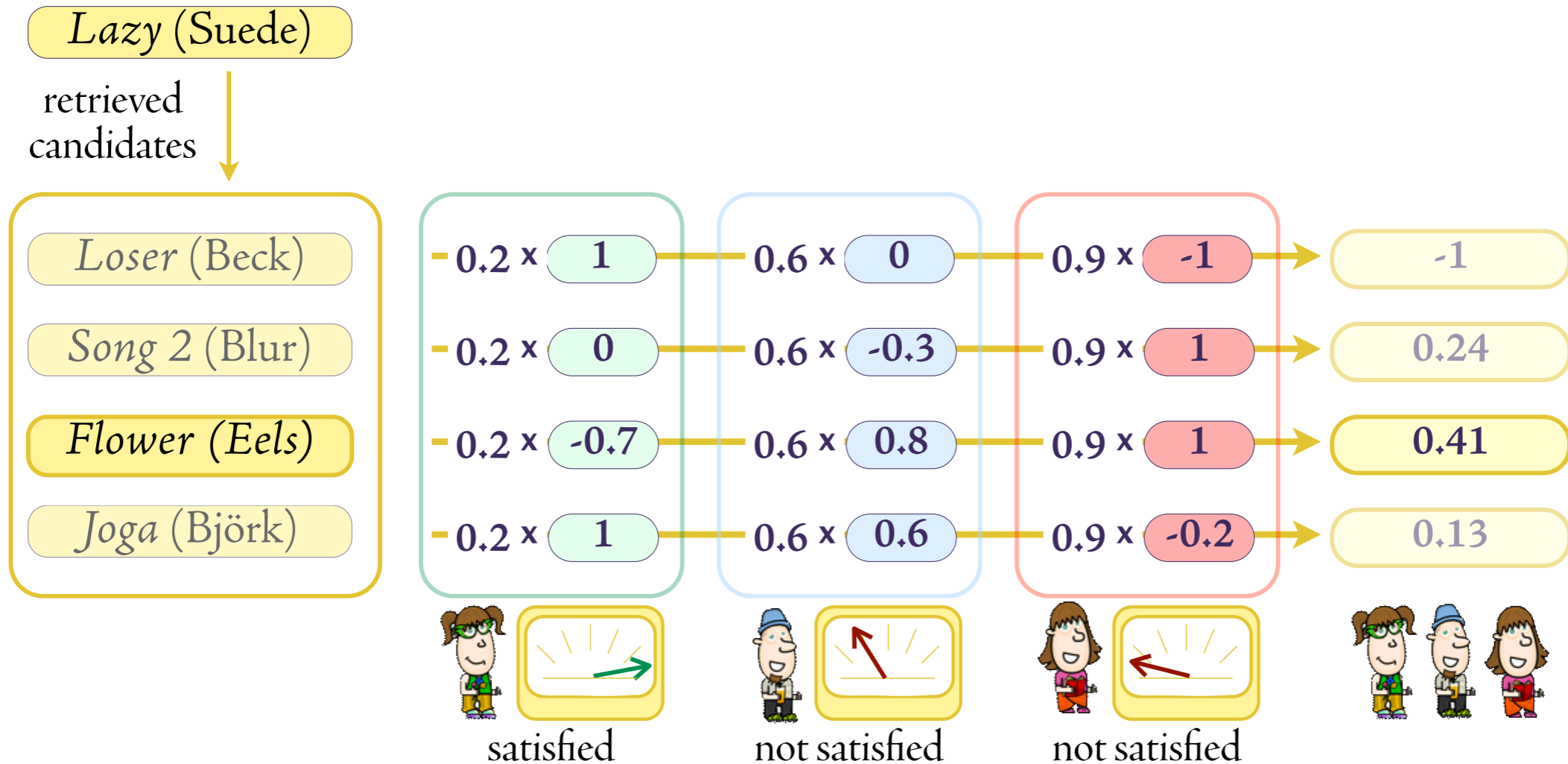
How to Combine Different Individual Preferences

3. To guarantee **individual satisfactions**, listeners whose preferred song was not selected in this turn are to be favoured next



How to Combine Different Individual Preferences

4. The **satisfaction degree** of a listener for previous songs changes her **weight** in the calculation of the average group preference

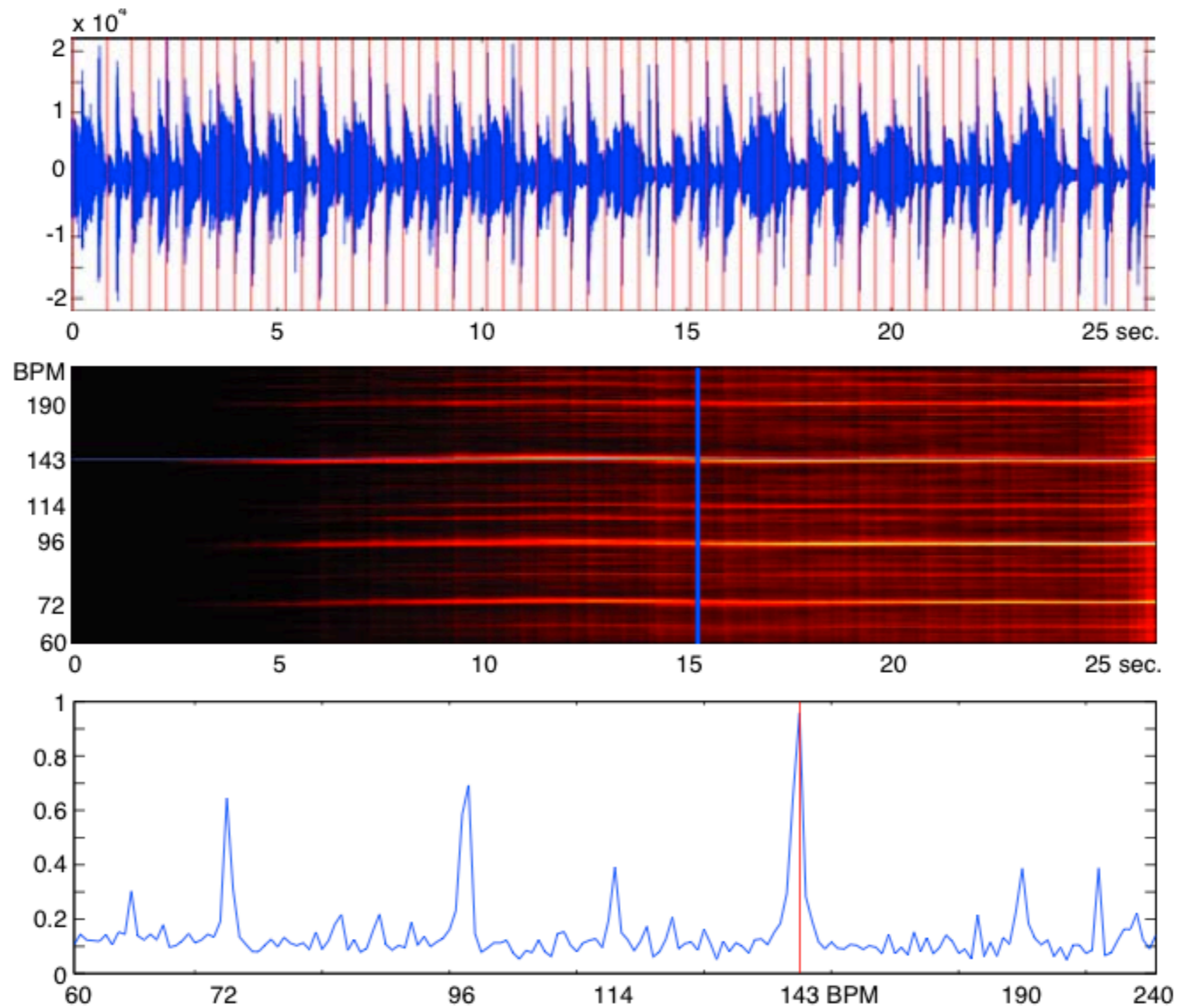


Beat-matching Crossfading

Beat-matching and crossfading

- Select songs with similar tempos
- Select transition location
 - Similar rhythmic pattern
 - Specific sections (last 30 seconds of song 1 and first 30 seconds of song 2)
- Align their beats over the course of a transition
- Crossfade the volumes

First, find the beats



Time scaling

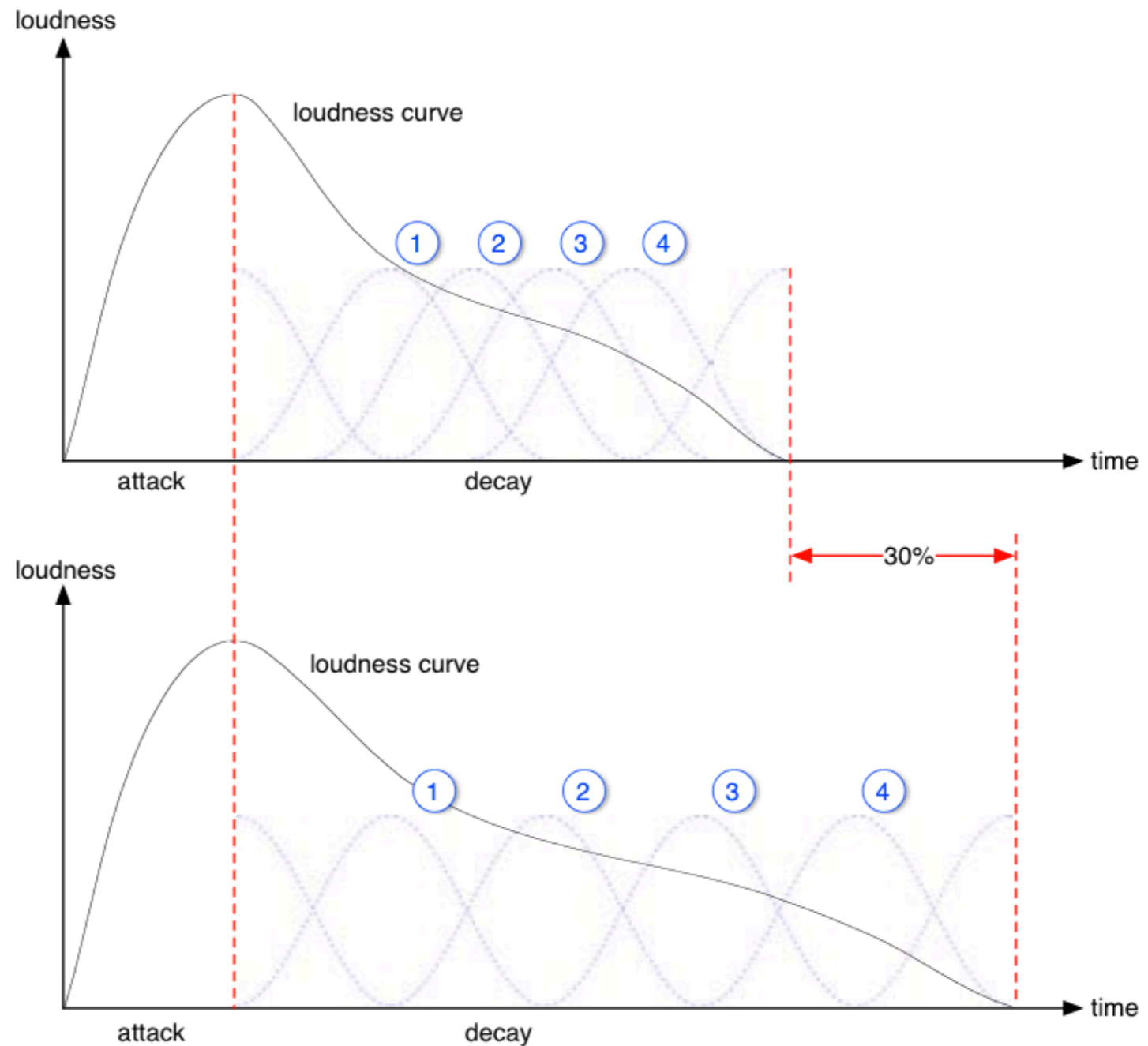
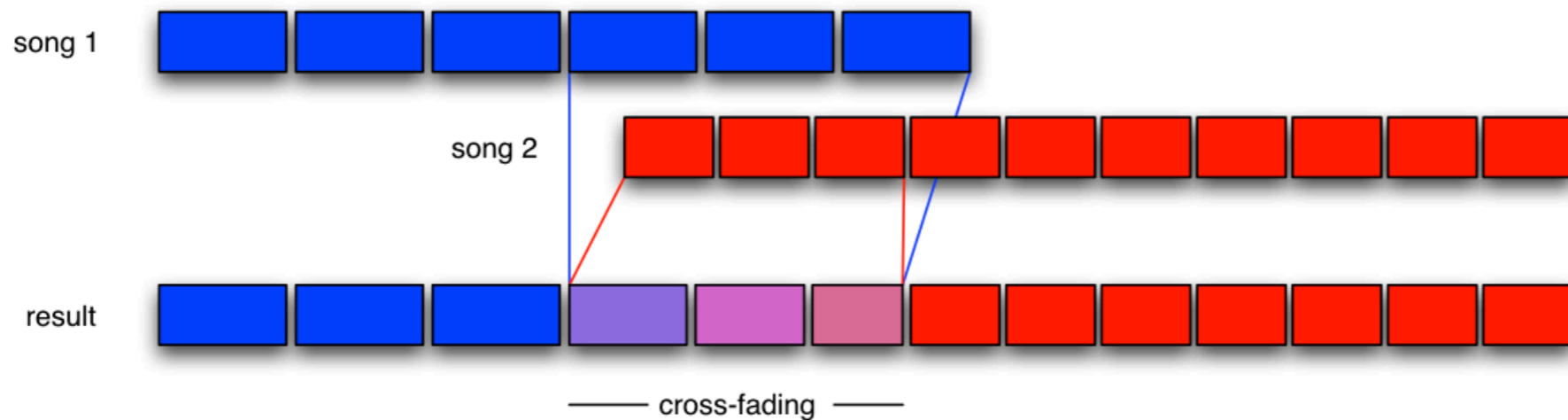
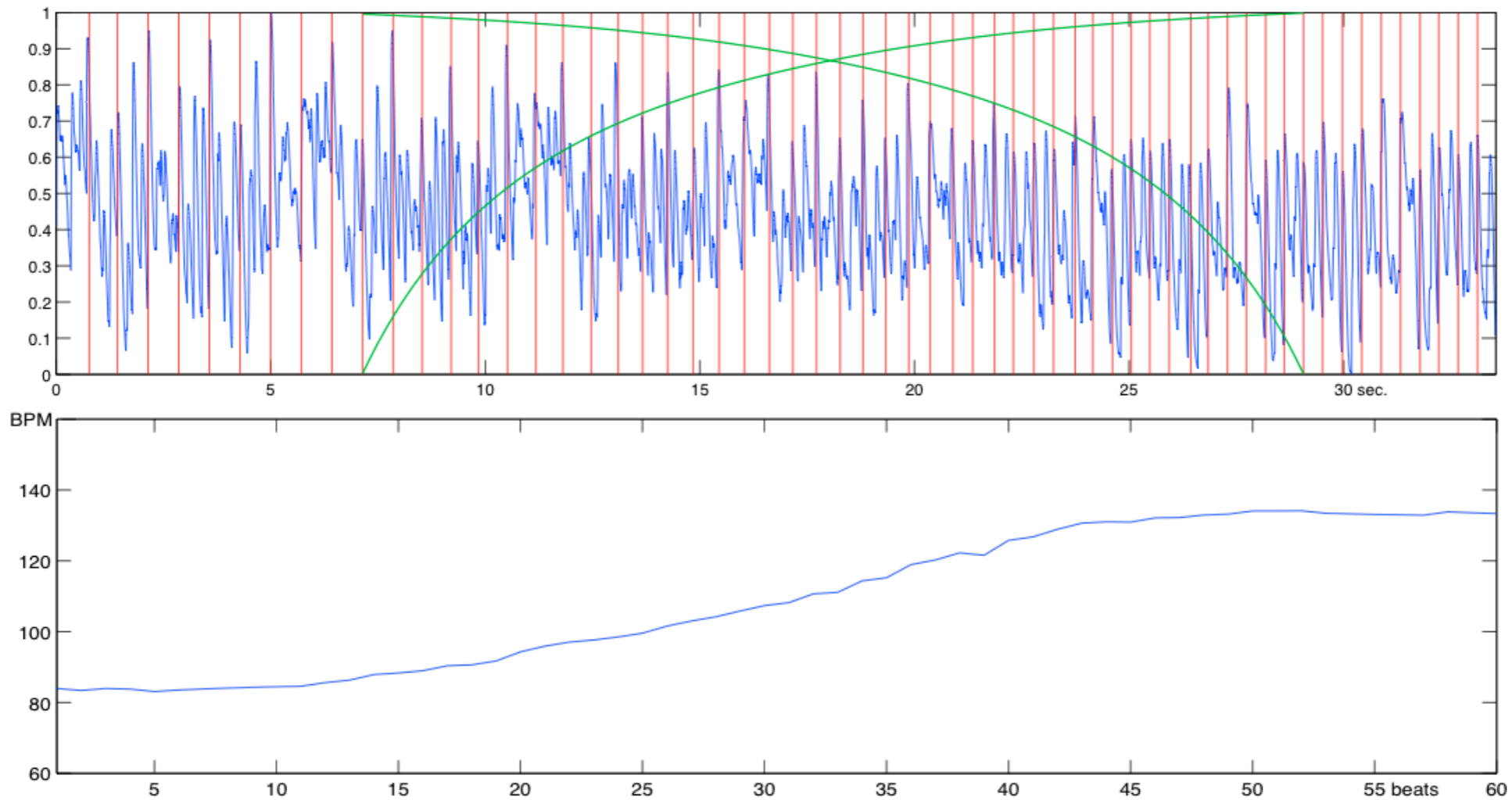
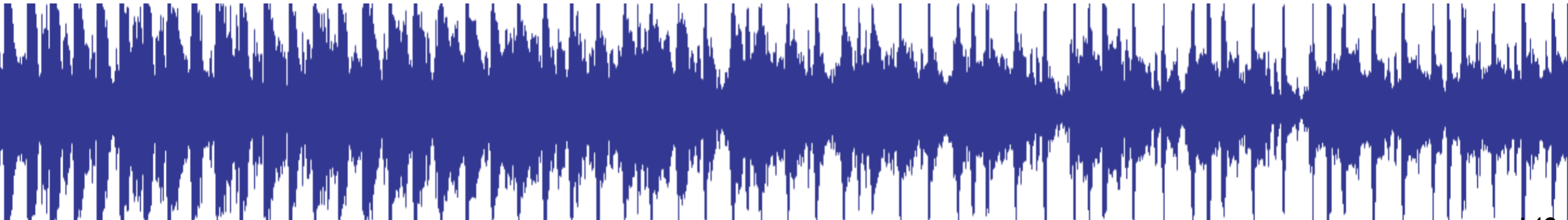


Figure 6-1: Time-scaling example of a typical sound segment. Note that we only process the decay part of the sound. The energy is preserved by overlapping and adding Hanning windows by 50%. In this example we stretch the whole segment [top] by an additional 30% [bottom].

Beat-matching and crossfading



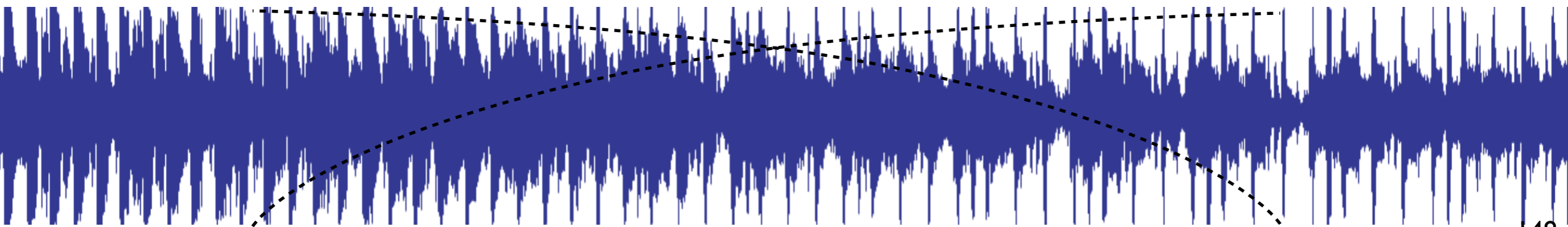
Some Examples



Some Examples

Rihanna (122 bpm)

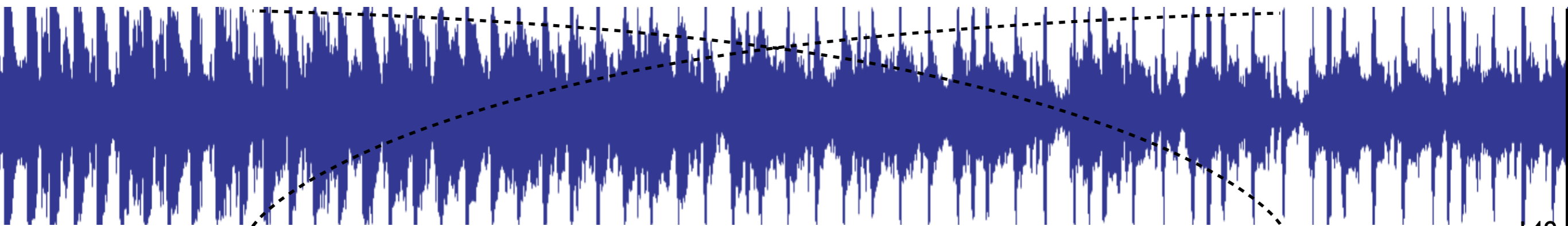
(95 bpm) Gotan Project



Some Examples

Rihanna (122 bpm)

(95 bpm) Gotan Project

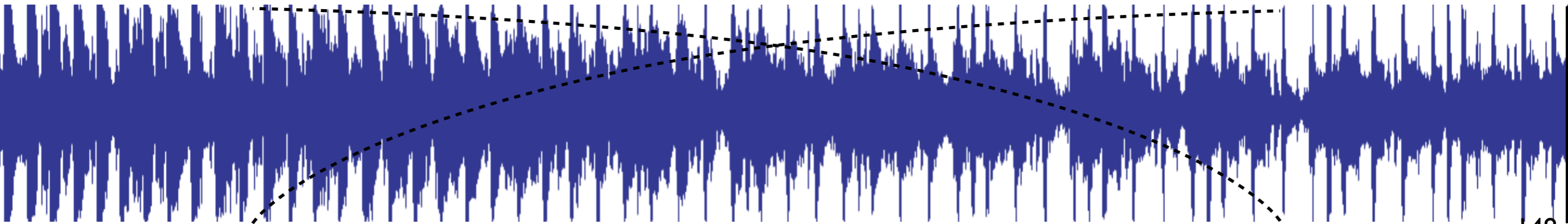


Some Examples

Bob Marley to Bob Marley

Rihanna (122 bpm)

(95 bpm) Gotan Project

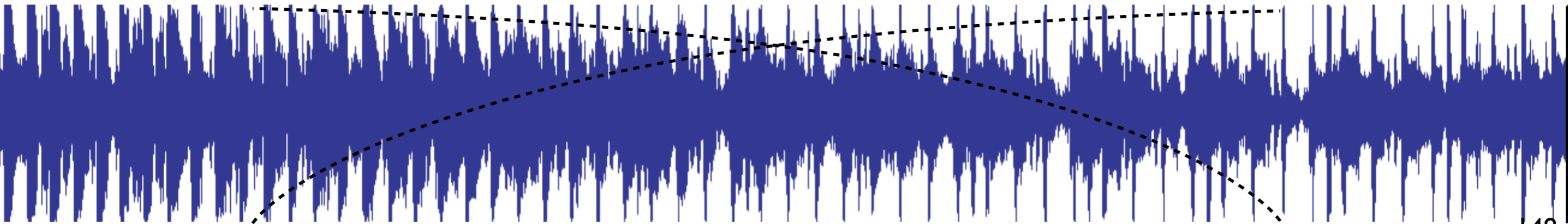


Some Examples

Bob Marley to Bob Marley

Rihanna (122 bpm)

(95 bpm) Gotan Project

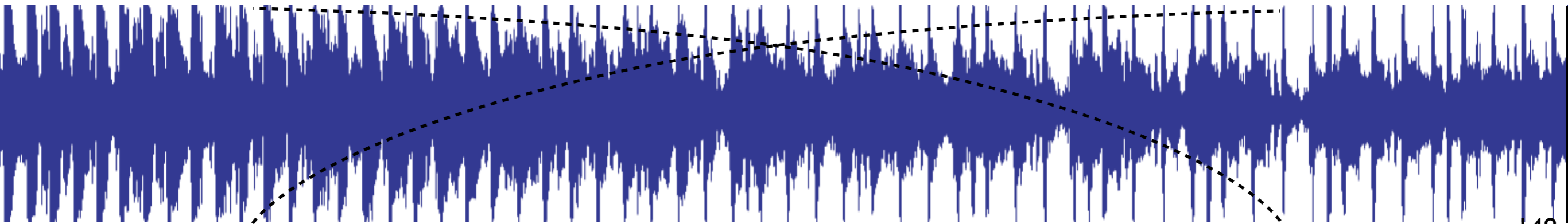


Some Examples

Bob Marley to Bob Marley

Rihanna (122 bpm)

(95 bpm) Gotan Project

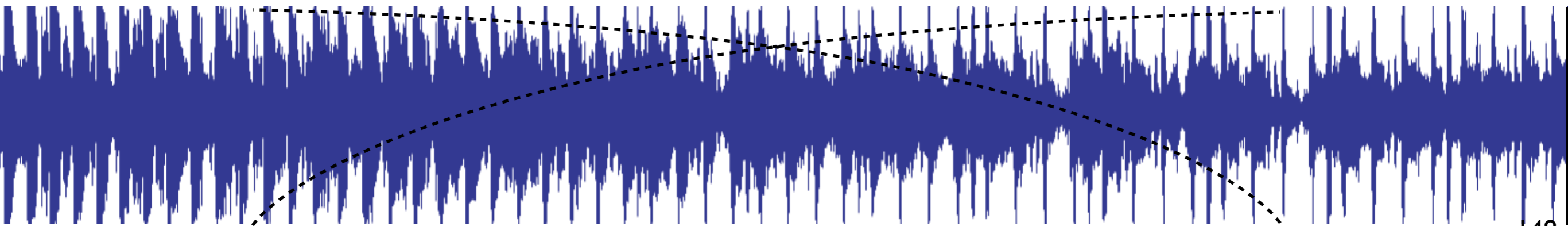


Some Examples

Bob Marley to Bob Marley
Sade to Sting

Rihanna (122 bpm)

(95 bpm) Gotan Project

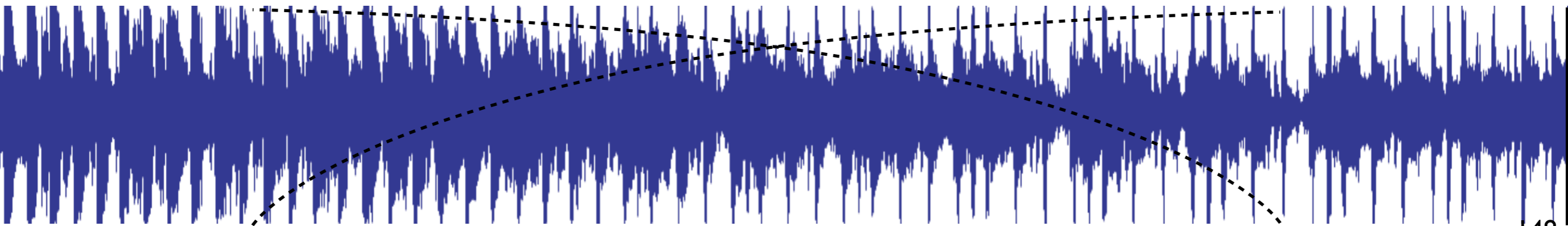


Some Examples

Bob Marley to Bob Marley
Sade to Sting

Rihanna (122 bpm)

(95 bpm) Gotan Project

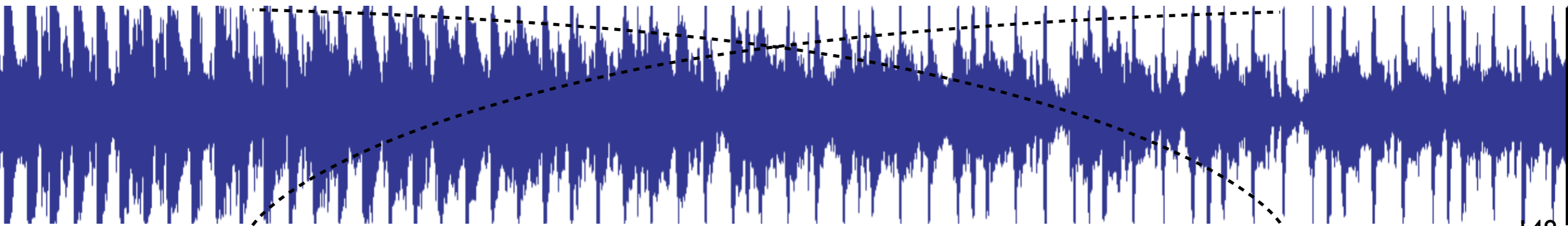


Some Examples

Bob Marley to Bob Marley
Sade to Sting

Rihanna (122 bpm)

(95 bpm) Gotan Project



Some Examples

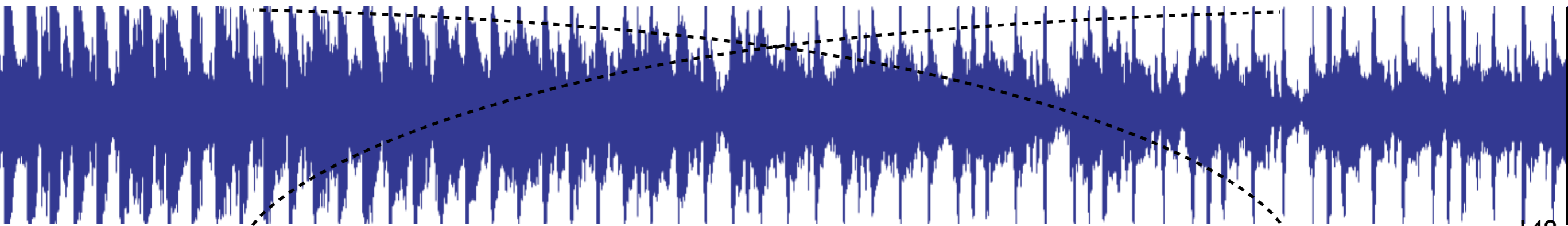
Bob Marley to Bob Marley

Sade to Sting

April March to April March

Rihanna (122 bpm)

(95 bpm) Gotan Project



Some Examples

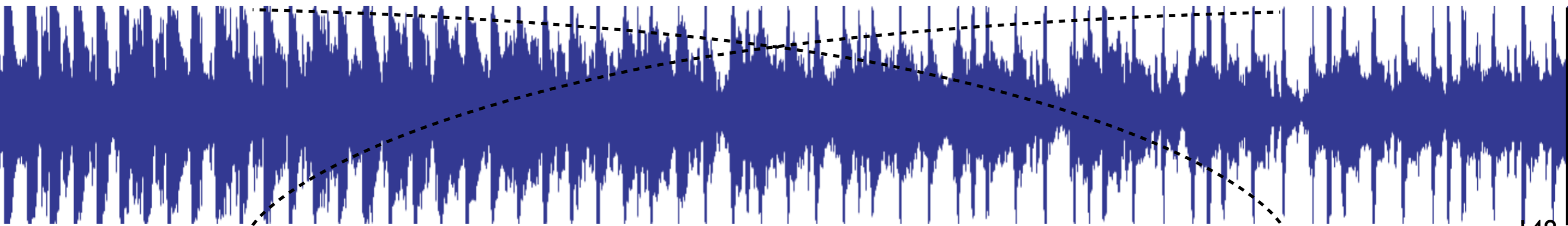
Bob Marley to Bob Marley

Sade to Sting

April March to April March

Rihanna (122 bpm)

(95 bpm) Gotan Project



Evaluating playlists

Subjective Analysis

Direct Listening Tests

hypotheses

1. Playlists compiled by PATS contain more preferred songs than randomly assembled playlists, irrespective of a given context-of-use.
2. Similarly, PATS playlists are rated higher than randomly assembled playlists, irrespective of a given context-of-use.

Direct Listening Tests

hypotheses

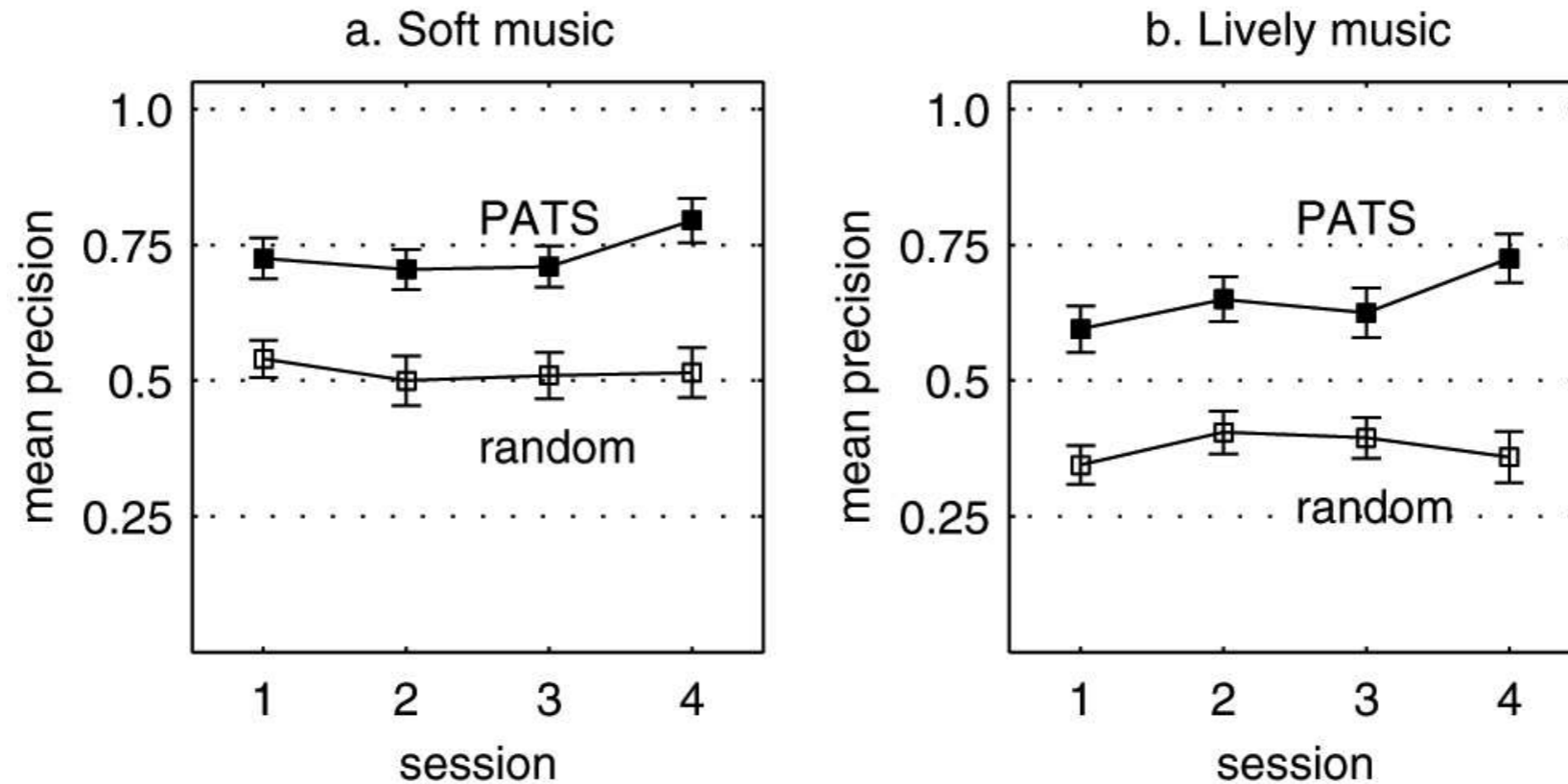
3. Successive playlists compiled by PATS contain an increasing number of preferred songs.
4. Similarly, successive PATS playlists are successively rated higher.
5. Successive playlists compiled by PATS contain more distinct and preferred songs than randomly assembled playlists.

Direct Listening Tests

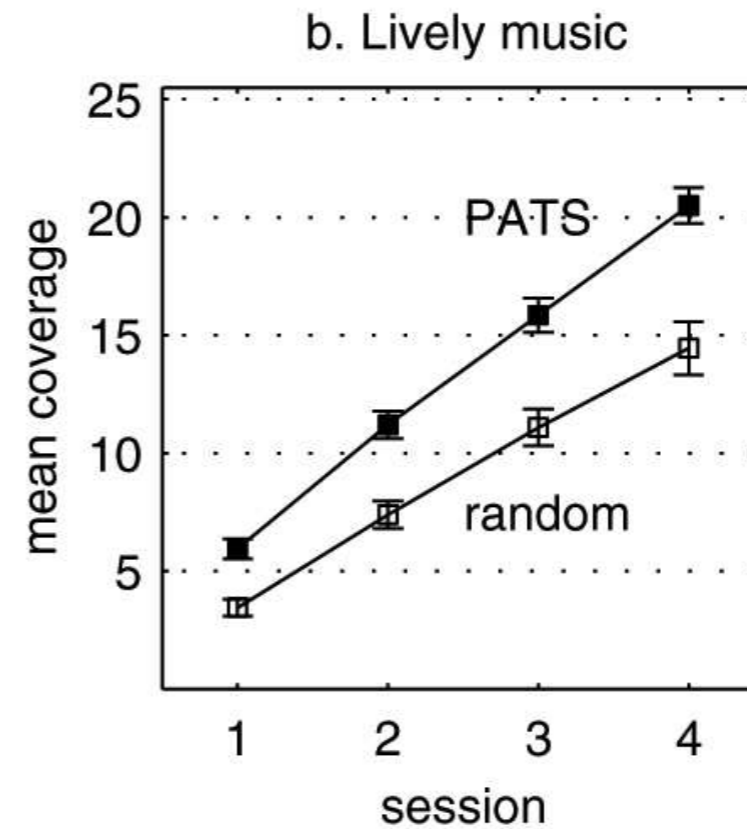
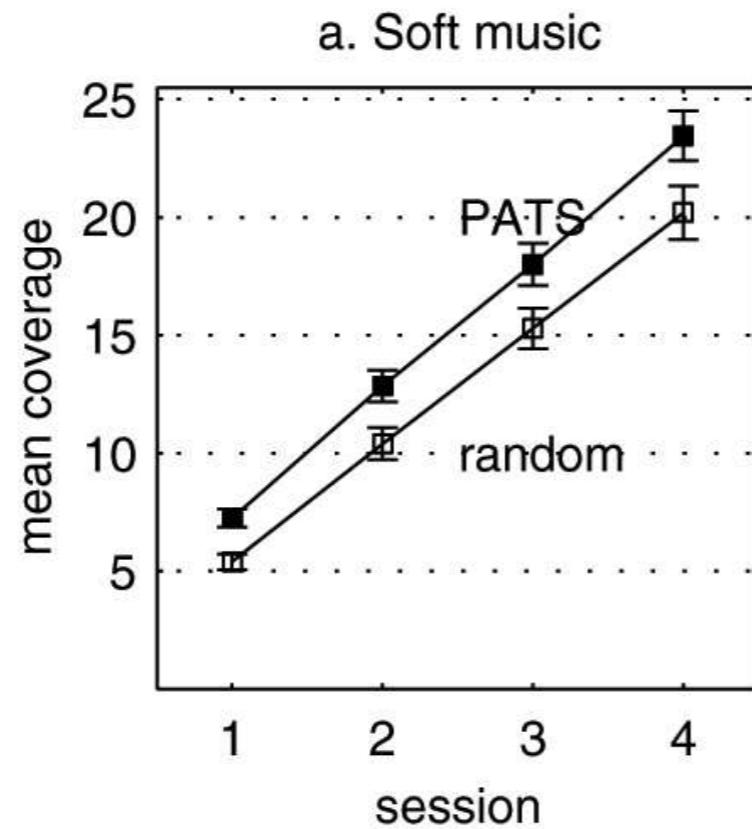
set-up

- Three measures: **precision, coverage** and **rating score**
- 20 participants (17m, 3f), 8 sessions over 4 days per participant
- User selects a song, given a context (4 playlist per context)
- A PATS playlist and a random playlist are generated (11 songs each, 1 minute excerpts)
- Judgements expressed per song, ratings per playlist

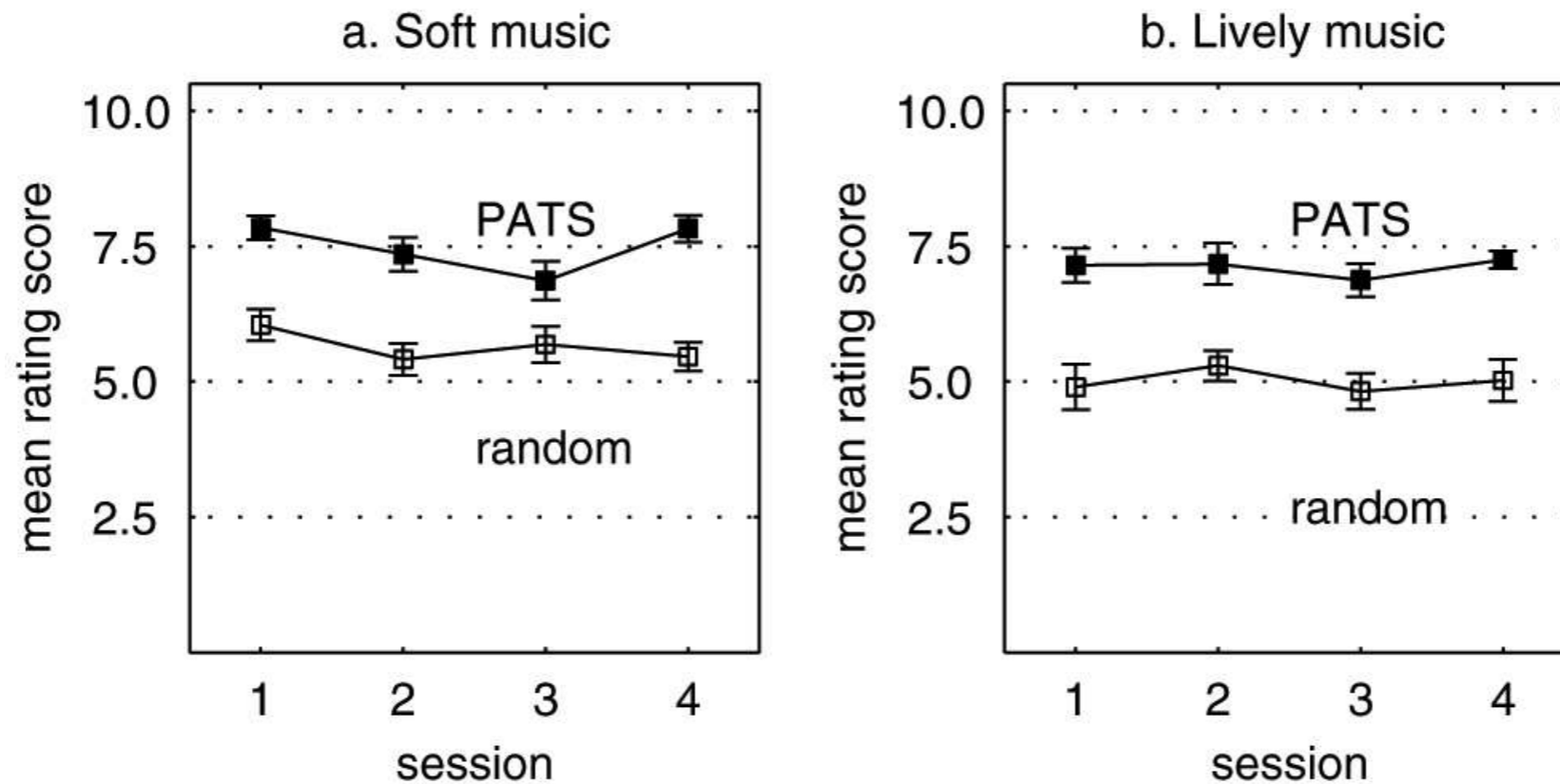
Direct Listening Tests results



Direct Listening Tests results



Direct Listening Tests results



Skip-Based Listening Tests

basics

- Evaluation integrated into system
- Assumptions:
 1. A seed song is given
 2. A skip button is available and easily accessible to the user
 3. A lazy user who is willing to sacrifice quality for time

Skip-Based Listening Tests

use cases

1. The user wants to listen to songs that are similar to the seed song
2. Same as (1) but with a dislike of an arbitrary artist for a subjective reason (eg taste)
3. The user's preference changes over time. Specifically, in a 20 song playlist, the first 5 songs from genre *A*, the middle 10 from either genre *A* or *B*, last 5 songs from genre *B*.

Skip-Based Listening Tests

heuristics

- A. N nearest neighbors to the seed song are played ($N = \mathbf{accepted} + \mathbf{skipped}$). This heuristic is the baseline.
- B. The candidate song **closest** to the **last song accepted** by the user is played. This is like (A) except the seed song is always the last song accepted.
- C. The candidate song **closest to any** of the accepted songs is played.
- D. For each candidate song, let d_a be the distance to the nearest accepted, and let d_s be the distance to the nearest skipped. If $d_a < d_s$, then add the candidate to the set S . From S play the song with smallest d_a . If S is empty, then play the candidate song which has the best (i.e. the lowest) d_a/d_s ratio.

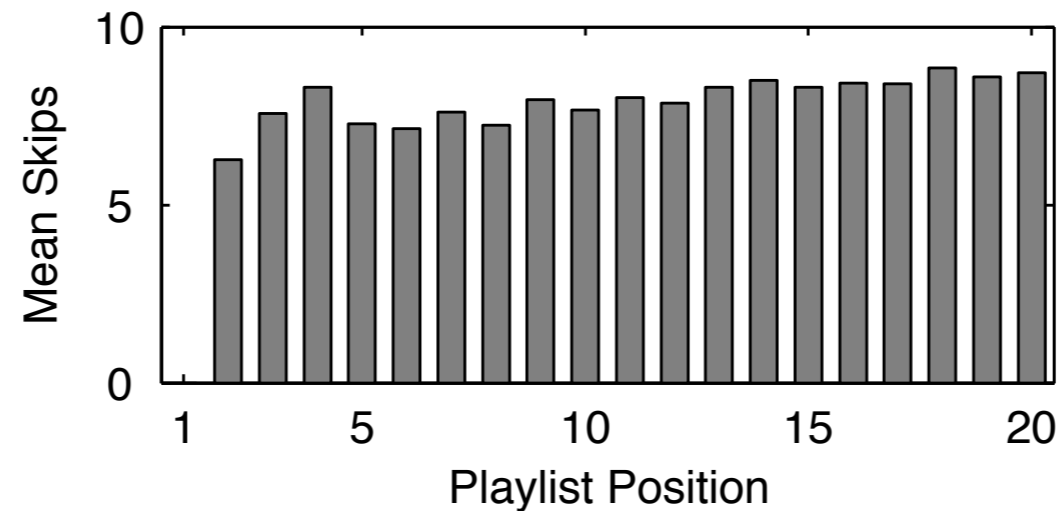
Skip-Based Listening Tests

skips in UCI

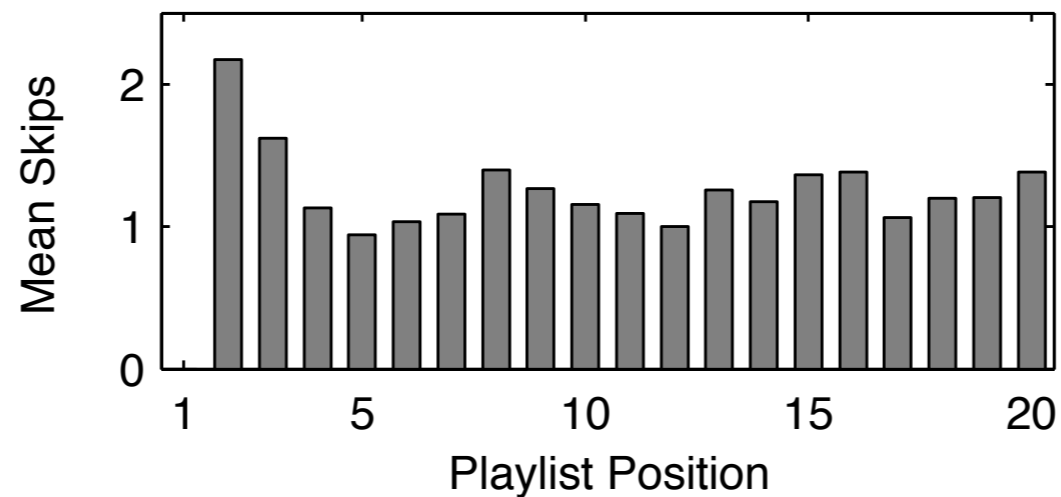
| Genres | Artists | Tracks | Artists/Genre | | Tracks/Genre | |
|--------|---------|--------|---------------|-----|--------------|-----|
| | | | Min | Max | Min | Max |
| 22 | 103 | 2522 | 3 | 6 | 45 | 259 |

Skip-Based Listening Tests

skips in UCI



(a) Heuristic A



(b) Heuristic D

Skip-Based Listening Tests

UC1 and UC2 skips

| | Heuristic | Min | Median | Mean | Max |
|------|-----------|-----|--------|-------|------|
| UC-1 | A | 0 | 37.0 | 133.0 | 2053 |
| | B | 0 | 30.0 | 164.4 | 2152 |
| | C | 0 | 14.0 | 91.0 | 1298 |
| | D | 0 | 11.0 | 23.9 | 425 |
| UC-2 | A | 0 | 52.0 | 174.0 | 2230 |
| | B | 0 | 36.0 | 241.1 | 2502 |
| | C | 0 | 17.0 | 116.9 | 1661 |
| | D | 0 | 15.0 | 32.9 | 453 |

Skip-Based Listening Tests

UC1 and UC2 skips

| | Heuristic | Min | Median | Mean | Max |
|------|-----------|-----|--------|-------|------|
| UC-1 | A | 0 | 37.0 | 133.0 | 2053 |
| | B | 0 | 30.0 | 164.4 | 2152 |
| | C | 0 | 14.0 | 91.0 | 1298 |
| | D | 0 | 11.0 | 23.9 | 425 |
| UC-2 | A | 0 | 52.0 | 174.0 | 2230 |
| | B | 0 | 36.0 | 241.1 | 2502 |
| | C | 0 | 17.0 | 116.9 | 1661 |
| | D | 0 | 15.0 | 32.9 | 453 |

Skip-Based Listening Tests

UC1 and UC2 skips

| | Heuristic | Min | Median | Mean | Max |
|------|-----------|-----|--------|-------|------|
| UC-1 | A | 0 | 37.0 | 133.0 | 2053 |
| | B | 0 | 30.0 | 164.4 | 2152 |
| | C | 0 | 14.0 | 91.0 | 1298 |
| | D | 0 | 11.0 | 23.9 | 425 |
| UC-2 | A | 0 | 52.0 | 174.0 | 2230 |
| | B | 0 | 36.0 | 241.1 | 2502 |
| | C | 0 | 17.0 | 116.9 | 1661 |
| | D | 0 | 15.0 | 32.9 | 453 |

Skip-Based Listening Tests

UC3 skips

| Start | Goto | Heuristic A | | Heuristic B | | Heuristic C | | Heuristic D | |
|--------------------|--------------------|-------------|--------|-------------|--------|-------------|--------|-------------|-------|
| | | Median | Mean | Median | Mean | Median | Mean | Median | Mean |
| Euro-Dance | Trance | 69.0 | 171.4 | 36.0 | 64.9 | 41.0 | 69.0 | 20.0 | 28.3 |
| Trance | Euro-Dance | 66.0 | 149.1 | 24.0 | 79.1 | 6.5 | 44.4 | 4.5 | 8.8 |
| German Hip Hop | Hard Core Rap | 33.0 | 61.9 | 32.0 | 45.6 | 31.0 | 40.7 | 23.0 | 28.1 |
| Hard Core Rap | German Hip Hop | 21.5 | 32.2 | 18.0 | 51.9 | 16.0 | 24.2 | 14.0 | 16.1 |
| Heavy Metal/Thrash | Death Metal | 98.5 | 146.4 | 54.0 | 92.5 | 58.0 | 61.1 | 28.0 | 28.4 |
| Death Metal | Heavy Metal/Thrash | 14.0 | 69.2 | 16.0 | 53.7 | 3.0 | 55.5 | 3.0 | 25.7 |
| Bossa Nova | Jazz Guitar | 68.5 | 228.1 | 32.0 | 118.7 | 54.0 | 61.1 | 22.0 | 21.3 |
| Jazz Guitar | Bossa Nova | 21.0 | 26.7 | 22.0 | 21.5 | 9.0 | 10.5 | 6.0 | 6.2 |
| Jazz Guitar | Jazz | 116.0 | 111.3 | 53.0 | 75.7 | 45.0 | 74.0 | 18.5 | 27.3 |
| Jazz | Jazz Guitar | 512.5 | 717.0 | 1286.0 | 1279.5 | 311.0 | 310.8 | 29.0 | 41.3 |
| A Cappella | Death Metal | 1235.0 | 1230.5 | 1523.0 | 1509.9 | 684.0 | 676.5 | 271.0 | 297 |
| Death Metal | A Cappella | 1688.0 | 1647.2 | 1696.0 | 1653.9 | 1186.0 | 1187.3 | 350.0 | 309.2 |

Skip-Based Listening Tests

UC3 skips

| Start | Goto | Heuristic A | | Heuristic B | | Heuristic C | | Heuristic D | |
|--------------------|--------------------|-------------|--------|-------------|--------|-------------|--------|-------------|-------|
| | | Median | Mean | Median | Mean | Median | Mean | Median | Mean |
| Euro-Dance | Trance | 69.0 | 171.4 | 36.0 | 64.9 | 41.0 | 69.0 | 20.0 | 28.3 |
| Trance | Euro-Dance | 66.0 | 149.1 | 24.0 | 79.1 | 6.5 | 44.4 | 4.5 | 8.8 |
| German Hip Hop | Hard Core Rap | 33.0 | 61.9 | 32.0 | 45.6 | 31.0 | 40.7 | 23.0 | 28.1 |
| Hard Core Rap | German Hip Hop | 21.5 | 32.2 | 18.0 | 51.9 | 16.0 | 24.2 | 14.0 | 16.1 |
| Heavy Metal/Thrash | Death Metal | 98.5 | 146.4 | 54.0 | 92.5 | 58.0 | 61.1 | 28.0 | 28.4 |
| Death Metal | Heavy Metal/Thrash | 14.0 | 69.2 | 16.0 | 53.7 | 3.0 | 55.5 | 3.0 | 25.7 |
| Bossa Nova | Jazz Guitar | 68.5 | 228.1 | 32.0 | 118.7 | 54.0 | 61.1 | 22.0 | 21.3 |
| Jazz Guitar | Bossa Nova | 21.0 | 26.7 | 22.0 | 21.5 | 9.0 | 10.5 | 6.0 | 6.2 |
| Jazz Guitar | Jazz | 116.0 | 111.3 | 53.0 | 75.7 | 45.0 | 74.0 | 18.5 | 27.3 |
| Jazz | Jazz Guitar | 512.5 | 717.0 | 1286.0 | 1279.5 | 311.0 | 310.8 | 29.0 | 41.3 |
| A Cappella | Death Metal | 1235.0 | 1230.5 | 1523.0 | 1509.9 | 684.0 | 676.5 | 271.0 | 297 |
| Death Metal | A Cappella | 1688.0 | 1647.2 | 1696.0 | 1653.9 | 1186.0 | 1187.3 | 350.0 | 309.2 |

Skip-Based Listening Tests

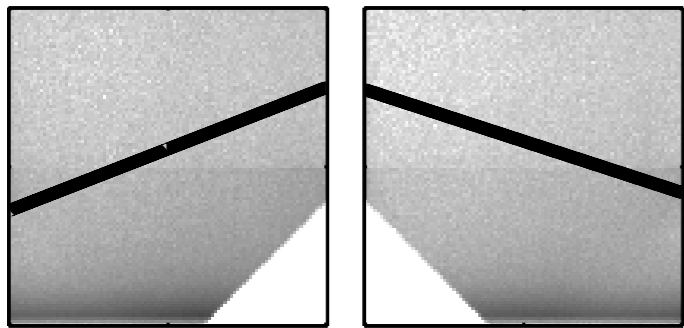
UC3 skips

| Start | Goto | Heuristic A | | Heuristic B | | Heuristic C | | Heuristic D | |
|--------------------|--------------------|-------------|--------|-------------|--------|-------------|--------|-------------|-------|
| | | Median | Mean | Median | Mean | Median | Mean | Median | Mean |
| Euro-Dance | Trance | 69.0 | 171.4 | 36.0 | 64.9 | 41.0 | 69.0 | 20.0 | 28.3 |
| Trance | Euro-Dance | 66.0 | 149.1 | 24.0 | 79.1 | 6.5 | 44.4 | 4.5 | 8.8 |
| German Hip Hop | Hard Core Rap | 33.0 | 61.9 | 32.0 | 45.6 | 31.0 | 40.7 | 23.0 | 28.1 |
| Hard Core Rap | German Hip Hop | 21.5 | 32.2 | 18.0 | 51.9 | 16.0 | 24.2 | 14.0 | 16.1 |
| Heavy Metal/Thrash | Death Metal | 98.5 | 146.4 | 54.0 | 92.5 | 58.0 | 61.1 | 28.0 | 28.4 |
| Death Metal | Heavy Metal/Thrash | 14.0 | 69.2 | 16.0 | 53.7 | 3.0 | 55.5 | 3.0 | 25.7 |
| Bossa Nova | Jazz Guitar | 68.5 | 228.1 | 32.0 | 118.7 | 54.0 | 61.1 | 22.0 | 21.3 |
| Jazz Guitar | Bossa Nova | 21.0 | 26.7 | 22.0 | 21.5 | 9.0 | 10.5 | 6.0 | 6.2 |
| Jazz Guitar | Jazz | 116.0 | 111.3 | 53.0 | 75.7 | 45.0 | 74.0 | 18.5 | 27.3 |
| Jazz | Jazz Guitar | 512.5 | 717.0 | 1286.0 | 1279.5 | 311.0 | 310.8 | 29.0 | 41.3 |
| A Cappella | Death Metal | 1235.0 | 1230.5 | 1523.0 | 1509.9 | 684.0 | 676.5 | 271.0 | 297 |
| Death Metal | A Cappella | 1688.0 | 1647.2 | 1696.0 | 1653.9 | 1186.0 | 1187.3 | 350.0 | 309.2 |

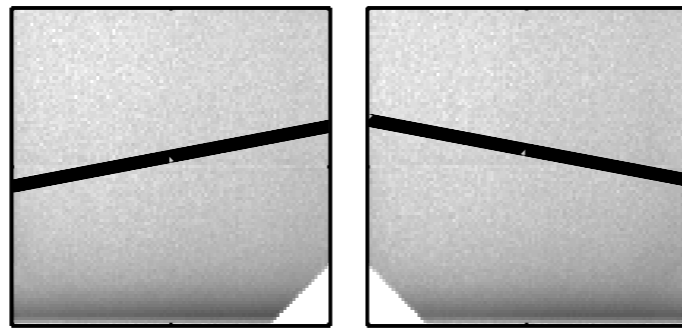
Dynamic Heuristics

- Last.fm Radio logs are used to analyze and evaluate several heuristics for dynamic playlists
- This is done through the treatment of playlists as fuzzy sets
- Work shows that one heuristic work best given **inconsistent rejects** while another performs best given **inconsistent accepts** and third performs equally in either environment.

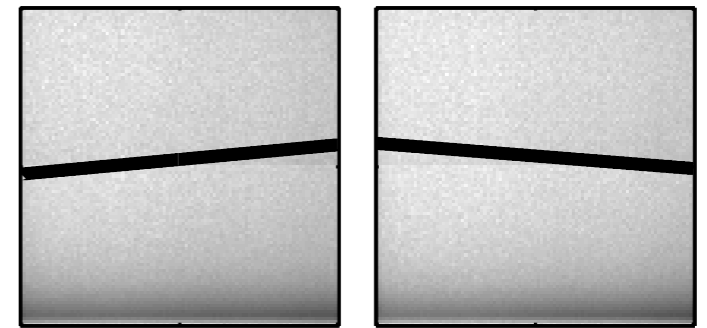
Dynamic Heuristics



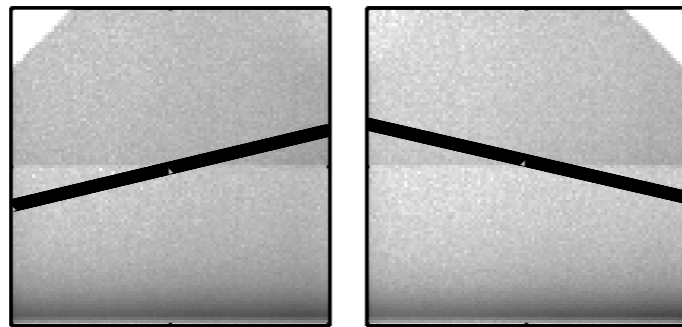
(a) dataset 1



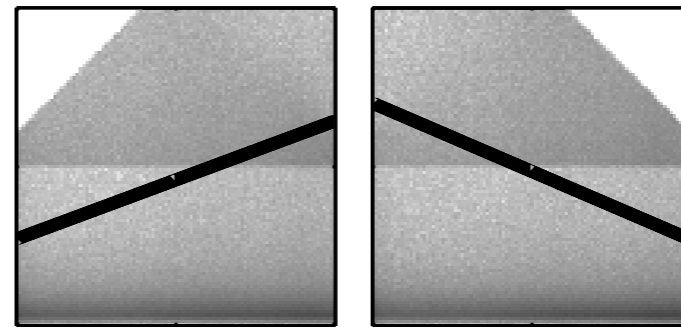
(b) dataset 3



(c) dataset 5

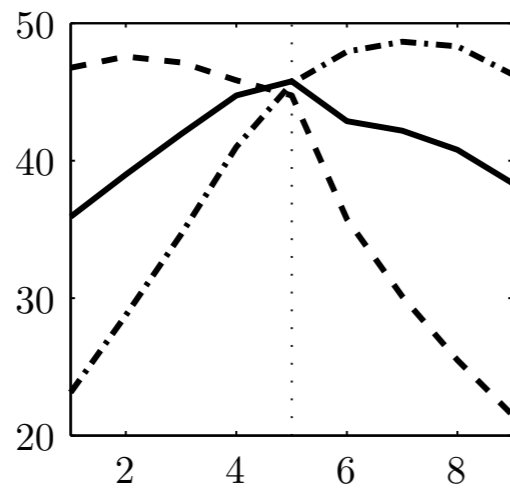


(d) dataset 7

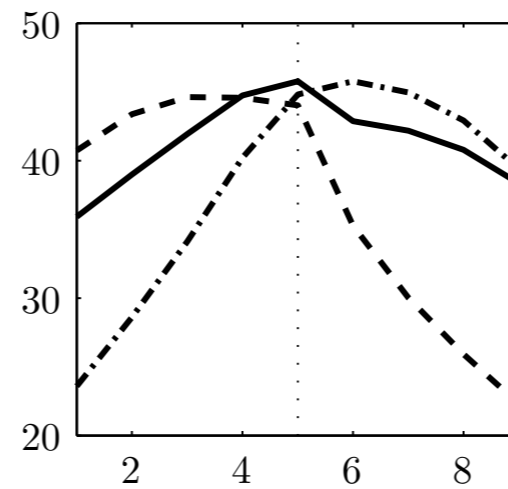


(e) dataset 9

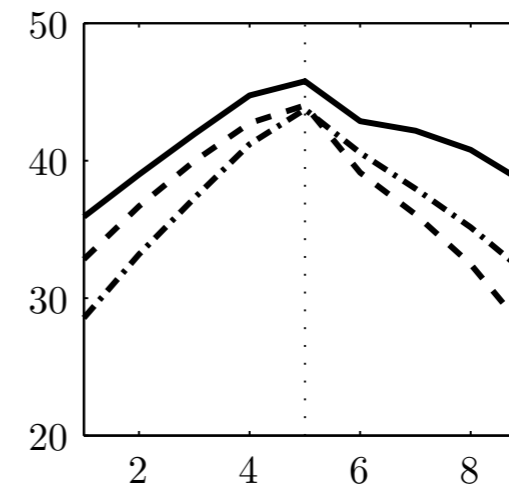
Dynamic Heuristics



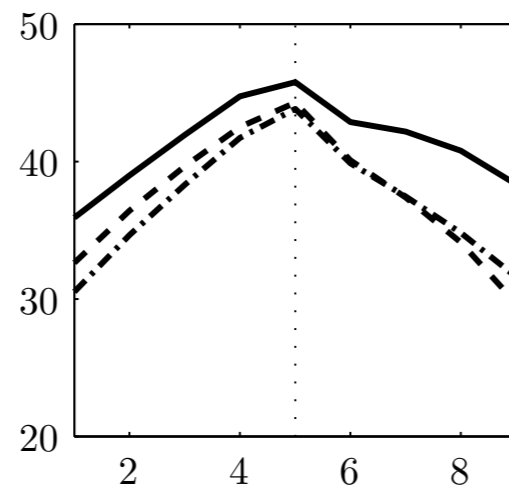
(a) I_{S_M}



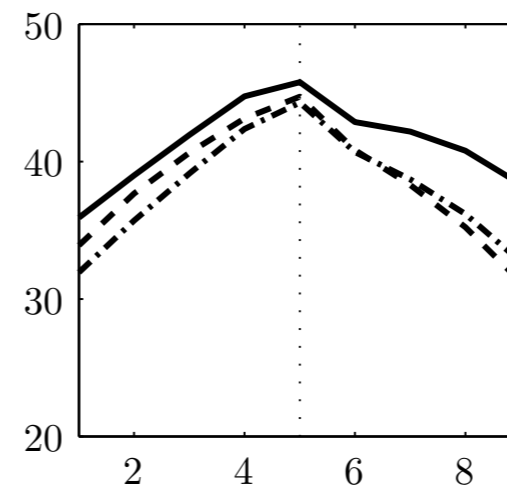
(b) I_{S_P}



(c) $I_{S_L} = I_{T_L}$



(d) I_{T_P}



(e) I_{T_M}

objective analysis

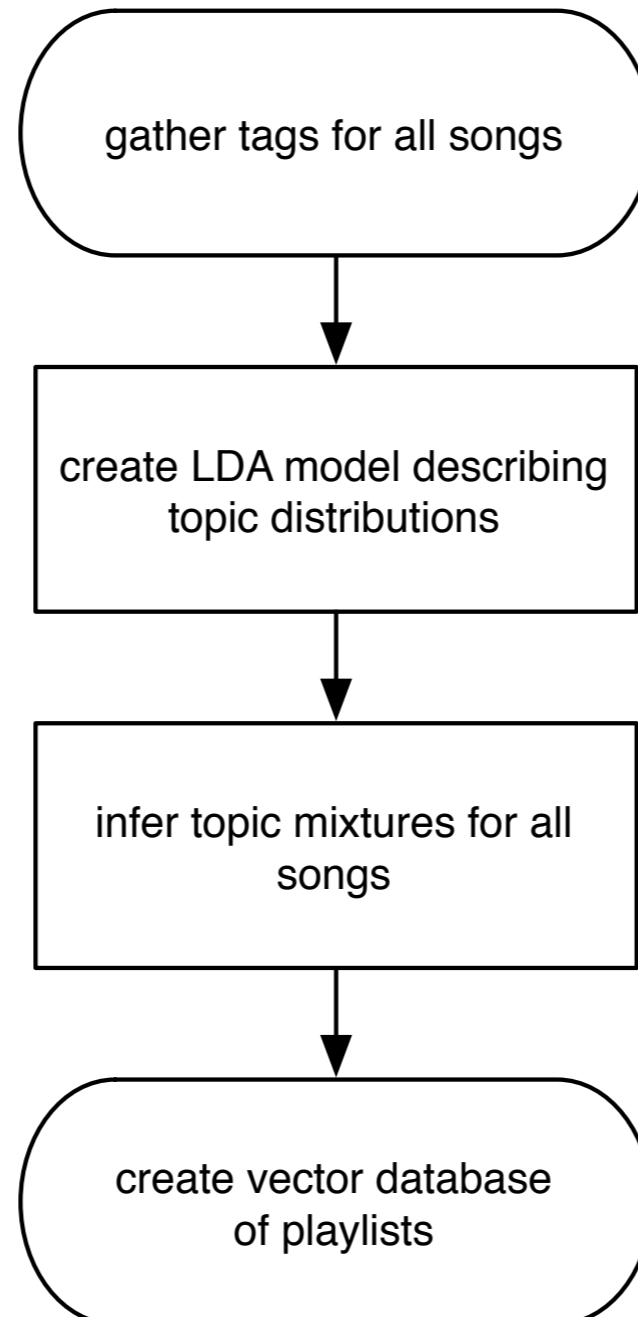
Measuring Distance

We can measure the distance between sequences of **tracks** using the same methods we can use to measure the distance between **frames** within tracks.

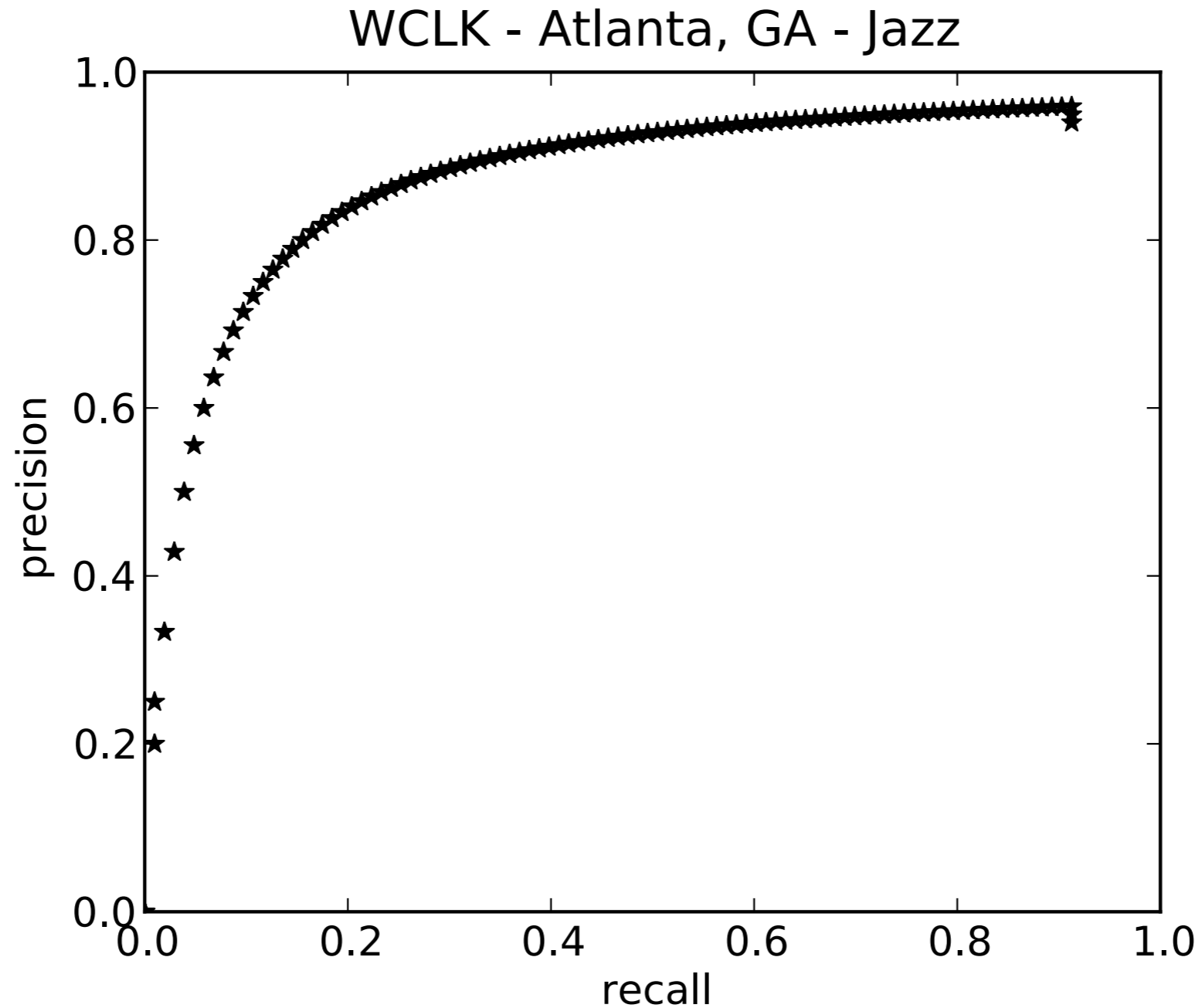
Measuring Distance

- Topic Modeled Tag Clouds used as a song-level feature
- Sequences of these low dimensional features can then be compared
- The fitness of this pseudo-metric space is examined through patterns in radio playlist logs

Measuring Distance



Measuring Distance



An evaluation of various playlisting services

Radio Paradise



RP is a blend of many styles and genres of music, carefully selected and mixed by two real human beings. You'll hear modern and classic rock, world music, electronica, even a bit of classical and jazz. What you won't hear are random computer-generated playlists or mind-numbing commercials.

Our specialty is taking a diverse assortment of songs and making them flow together in a way that makes sense harmonically, rhythmically, and lyrically — an art that, to us, is the very essence of radio

- Listener supported, Internet streaming radio
- 75,000 registered listeners
- Real, radio DJs

radioparadise.com

Playlist Turing Test

The Playlist Survey

In this survey we are looking at the quality of playlists generated by human experts, computer algorithms and random number generators. You will be presented with 12 playlists. For each playlist, we ask you to rate the overall quality of the playlist as a whole and to predict whether the playlist was generated by a professional DJ, a computer algorithm or was created at random. At the end of the survey you'll be shown how accurate your predictions were. More info about this survey can be found at [The Playlist Survey](#)

What is your age?

What is your gender?

How often do you listen to Radio Paradise?

[Take the Survey](#)

Expert playlist data graciously provided by Radio Paradise



380 respondents

Radio Paradise Dataset


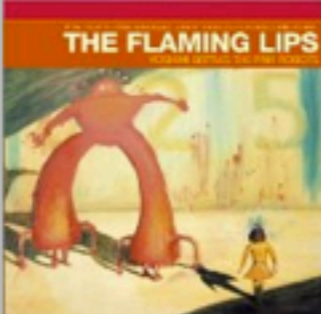


Playlists collected from Jan 2007 to July 2008

| | |
|----------------|--------|
| Playlists | 45,283 |
| Tracks | 6,325 |
| Albums | 4,094 |
| Artists | 1,971 |
| Average Length | 4.3 |

Playlist Turing Test

The Playlist Survey

12 Playlists remaining

| | |
|--|---|
|  | <p>Fresh Feeling Eels</p> <p>Play on Spotify Play in youtube</p> |
|  | <p>Are You A Hypnotist?? Flaming Lips</p> <p>Play on Spotify Play in youtube</p> |
|  | <p>Video Aimee Mann</p> <p>Play in youtube</p> |
|  | <p>Poor Leno Röyksopp</p> <p>Play on Spotify Play in youtube</p> |

Playlist rating?

Playlist type?

The Survey

Survey Ratings for guesses

| Playlist guess | Playlist Rating | Counts |
|-----------------------|------------------------|---------------|
| Human Expert | 3.33 | 368 |
| Algorithm | 2.76 | 373 |
| Random | 2.08 | 343 |

The Survey

Survey Ratings for truth

| Playlist type | Playlist Rating | Counts |
|----------------------|------------------------|---------------|
| Human Expert | 2.49 | 400 |
| Algorithm | 2.63 | 403 |
| Random | 2.64 | 386 |

The Survey

Confusion Matrix

| | Human Expert | Algorithm | Random |
|---------------------|---------------------|------------------|---------------|
| Human Expert | 121 | 124 | 112 |
| Algorithm | 122 | 126 | 123 |
| Random | 125 | 121 | 107 |

Truth

Guess

The Survey

The DJ

| Playlist guess | Guess | Actual |
|-----------------------|--------------|---------------|
| Human Expert | 3.6 | 3.5 |
| Algorithm | 3.0 | 2.25 |
| Random | 2.0 | 3.25 |

Objective Evaluation

Some playlist stats

Playlist stats

| Source | Radio Paradise | Musicmobs | art of the mix | Pandora |
|----------------------------|-----------------------|------------------|-----------------------|----------------|
| Playlists | 45,283 | 1,736 | 29,164 | 94 |
| Unique Artists | 1,971 | 19,113 | 48,169 | 556 |
| Unique Tracks | 6,325 | 93,931 | 218,261 | 908 |
| Average Length | 4.3 | 100 | 20 | 11 |
| % with duplicate artist | 0.3% | 79% | 49% | 48% |
| % with consecutive artists | 0.3% | 60% | 20% | 5% |

Pandora playlist stats based on listening on 44 separate 'stations'

Objective evaluation
Tag diversity

Playlist Tag Diversity

| Source | Tag Diversity | Random |
|----------------|----------------------|---------------|
| MusicMobs | 0.29 / 0.18 | 0.51 / 0.13 |
| Pandora | 0.44 / 0.20 | 0.64 / 0.19 |
| Art of the mix | 0.48 / 0.17 | 0.61 / 0.11 |
| Radio Paradise | 0.75 / 0.13 | 0.75 / 0.13 |

Tag Diversity: unique artist tags vs. total artist tags

Radio Paradise diversity examples

| Low Diversity Playlists | | |
|-------------------------|--------------------------------------|--|
| Artist | Track | Tags |
| Sun Volt | Live Free | Alt-country, americana, rock, country, folk, indie |
| Sun Kil Moon | Gentle Moon | indie, folk, singer-songwriter, americana, Alt-country, alternative |
| ANi DiFranco | Angry Any More | folk, singer-songwriter, female vocalists, indie, alternative, rock |
| Jim White | Handcuffed to a fence in Mississippi | Alt-country, singer-songwriter, americana, folk, indie, country |
| Jess Klein | Soda Water | folk, female vocalists, singer-songwriter, indie, acoustic, girls with guitars |

Diversity: 0.367

11 unique tags out of 30

Radio Paradise diversity examples

High Diversity Playlists

| Artist | Track | Tags |
|------------------------------|--------------|---|
| Big Head Todd & The Monsters | It's Alright | rock, alternative, jam band, prog rock, Jam, 90s |
| Joni Mitchell | Be Cool | folk, singer-songwriter, female vocalists, Canadian, classic rock, acoustic |
| Chet Baker | Tangerine | jazz, trumpet, cool jazz, blues, jazz vocals, easy listening |

Diversity: 1.0
18 unique tags out of 18

Pandora diversity examples

| Low Diversity Playlists | | |
|-------------------------|----------------------|--|
| Artist | Track | Tags |
| Project Pitchfork | Timekiller | industrial, ebm, electronic, darkwave, Gothic, synthpop, |
| Covenant | We stand alone | melodic black metal, black metal, synthpop, metal, industrial, futurepop |
| Icon of Coil | Faith? Not Important | ebm, industrial, futurepop, electronic, synthpop, darkwave |
| Neuroticfish | Waving Hands | ebm, futurepop, industrial, synthpop, electronic, goth |
| Project Pitchfork | Momentum | industrial, ebm, electronic, darkwave, Gothic, synthpop |
| Covenant | Stalker | melodic black metal, black metal, synthpop, metal, industrial, futurepop |

Diversity: 0.305

11 unique tags out of 36

Project Pitchfork Radio

Pandora diversity examples

High Diversity Playlists

| Artist | Track | Tags |
|-------------|-------------------|---|
| Metallica | The Call of Ktulu | metal, thrash metal, heavy metal, rock, hard rock,, metallica |
| Linkin Park | Pushing Me Away | rock, Nu Metal, alternative, metal, Linkin Park, punk |
| Creed | One Last Breath | rock, alternative, hard rock, Grunge, metal, punk |

Diversity: 0.611
11 unique tags out of 18

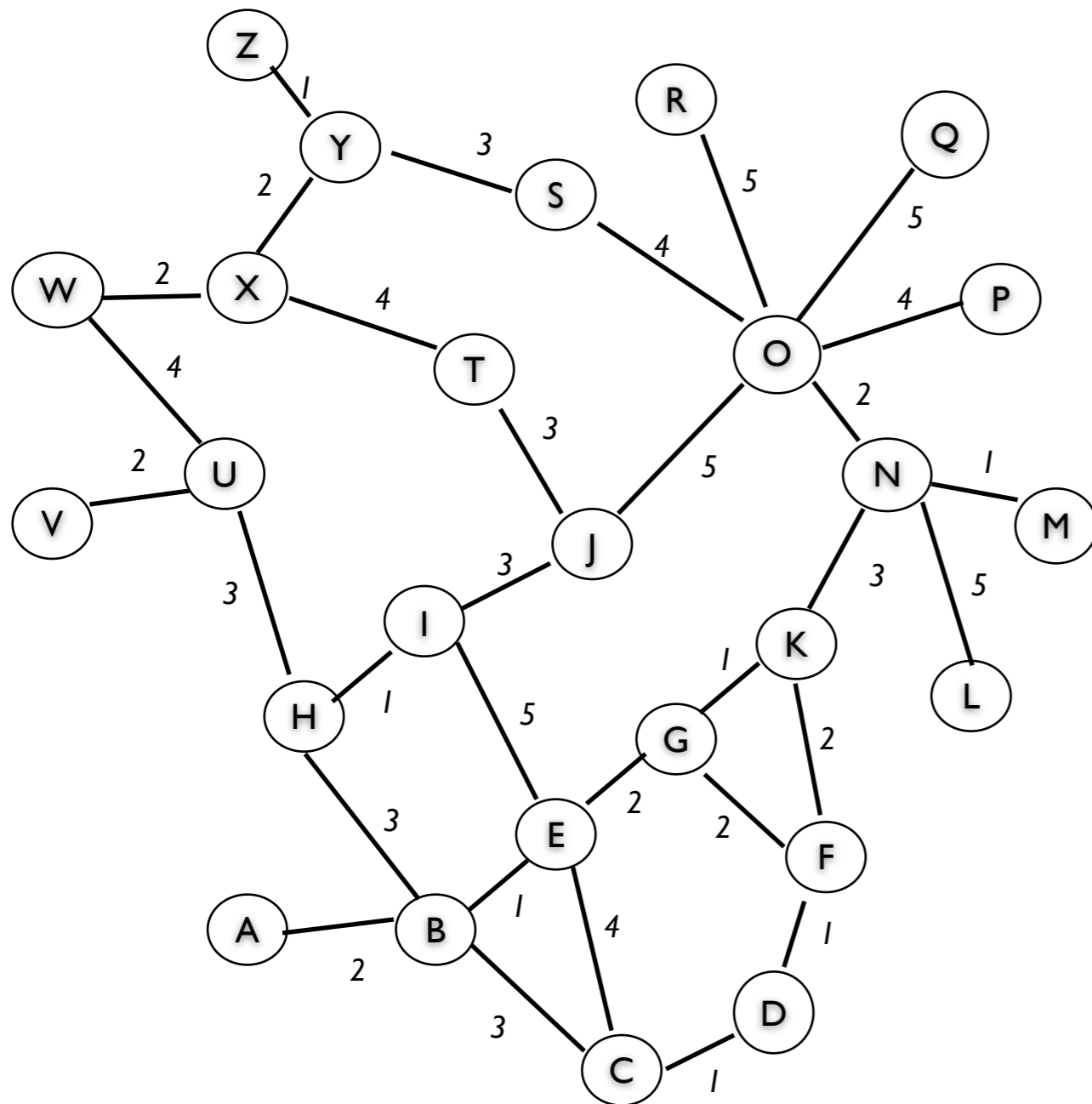
Evanescence Radio

Musicmobs diversity examples

| Low Diversity Playlists | | |
|-------------------------|-------------|--|
| Artist | Track | Tags |
| Perfect Circle | (54 Tracks) | rock, alternative, Progressive rock, metal, hard rock, industrial |
| Tool | (43 Tracks) | Progressive metal, Progressive rock, metal, rock, alternative, Progressive |

Diversity: 0.014
8 unique tags out of 582

Playlist Cohesion Metric



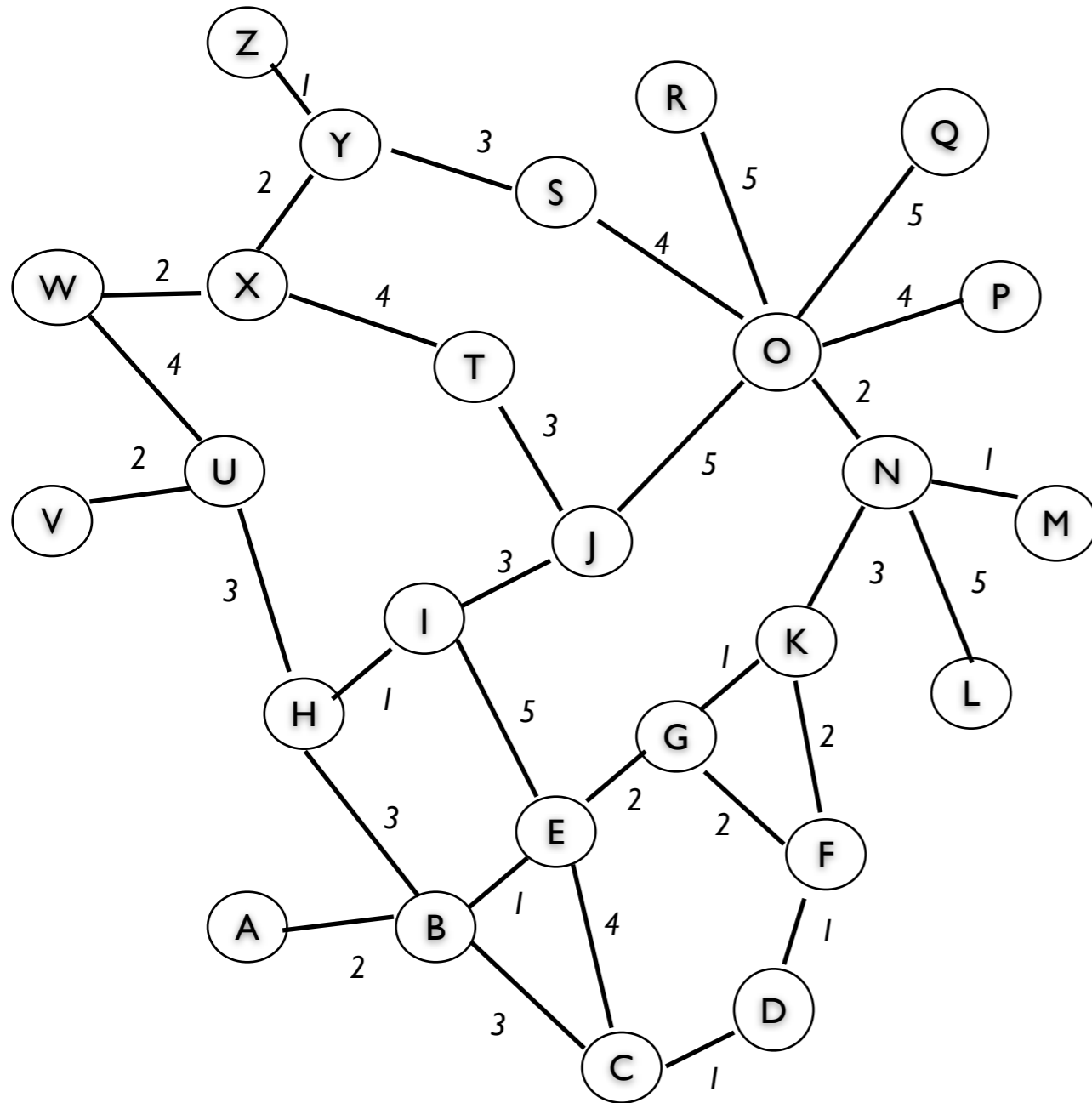
- Goal - find level of cohesion in an ordered sequence such as a playlist
- How:
 - Represent the item space as a connected graph
 - Find the shortest weighted path that connects the ordered sequence
 - Average step length is the cohesion index

Playlist Cohesion Metric



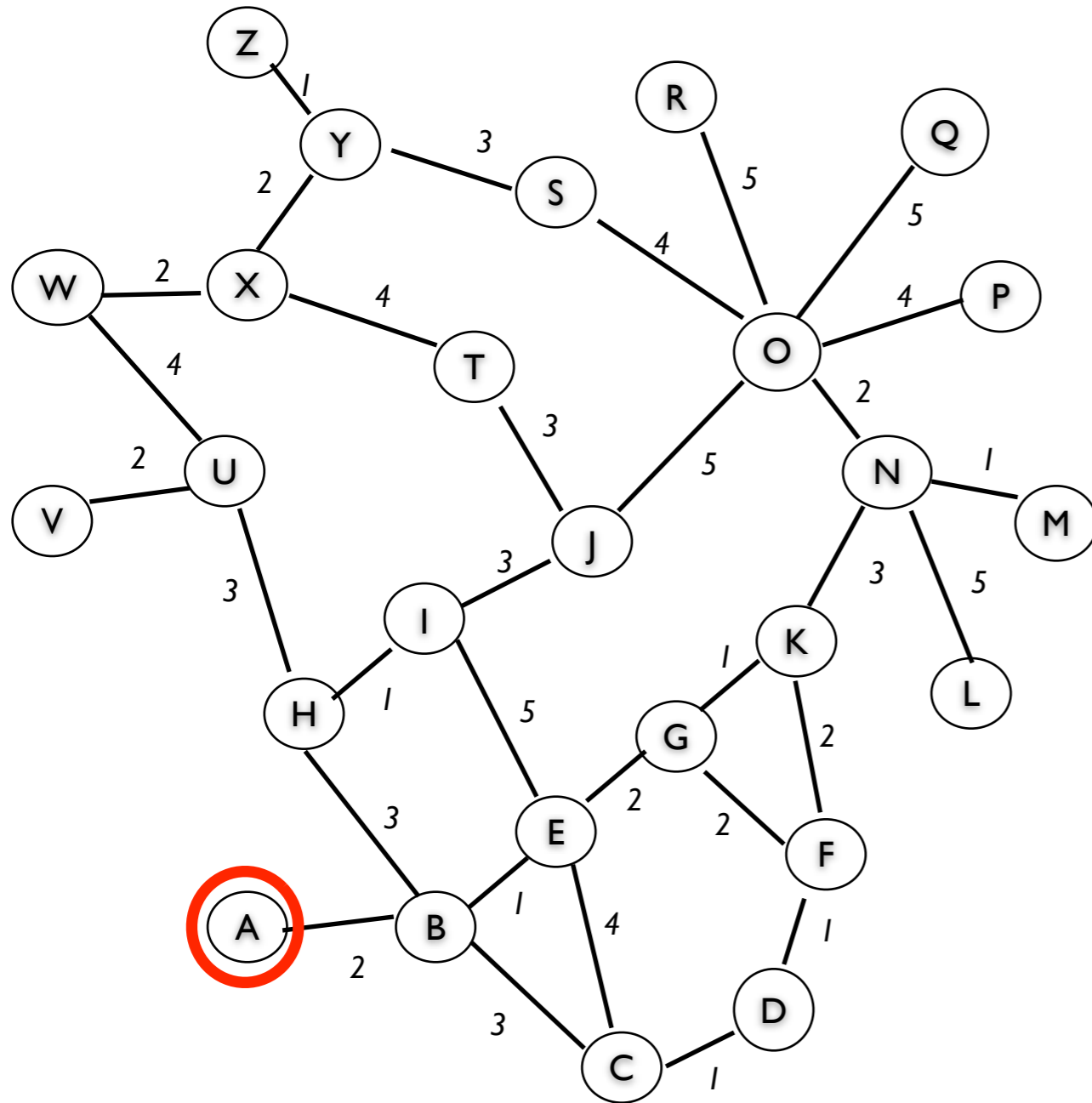
I especially like the "playlist cohesion" metric on slide 185(!) -- i will definitely refer to this next time i make a mix tape for a girl

Playlist Cohesion Metric



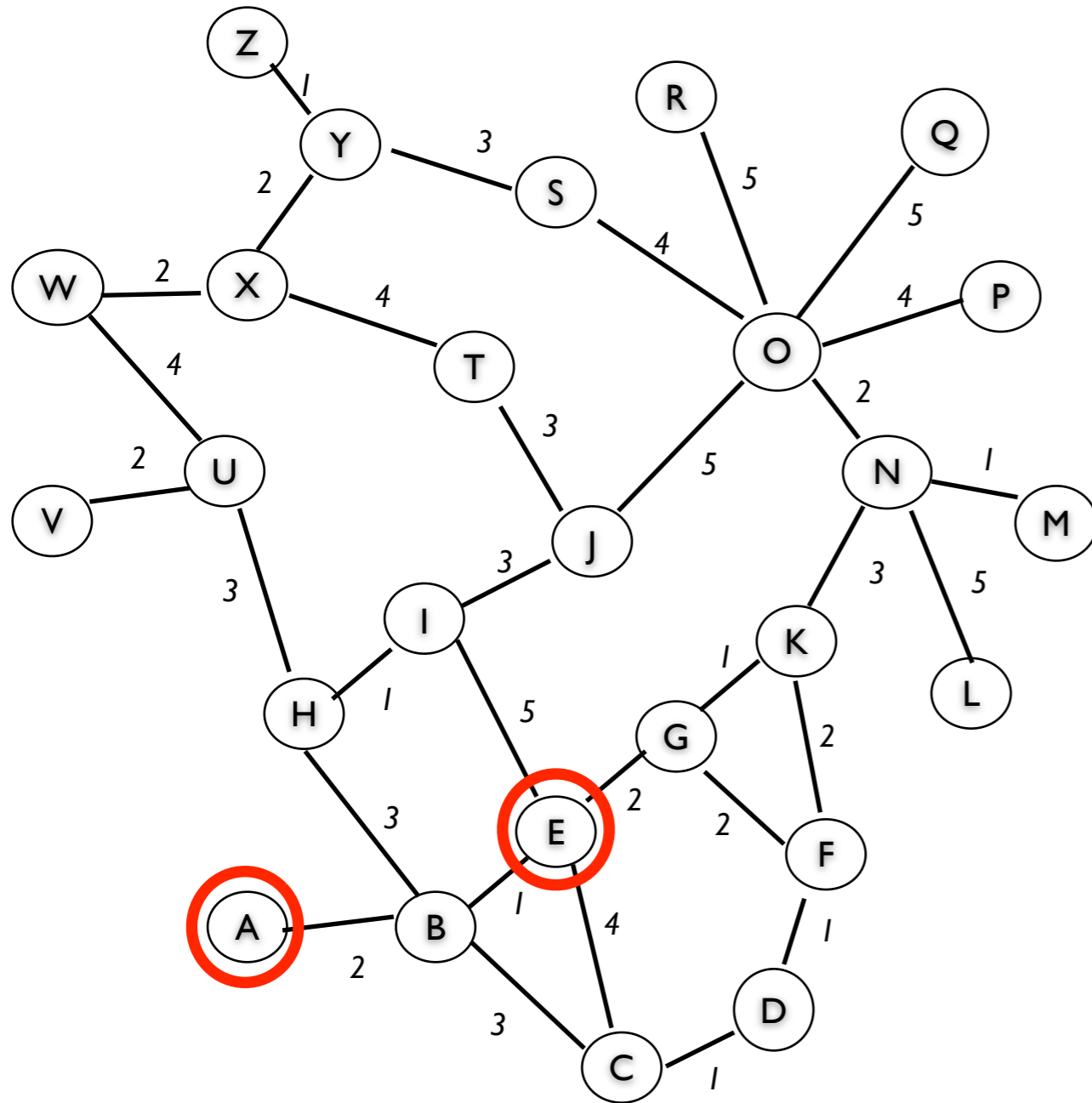
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



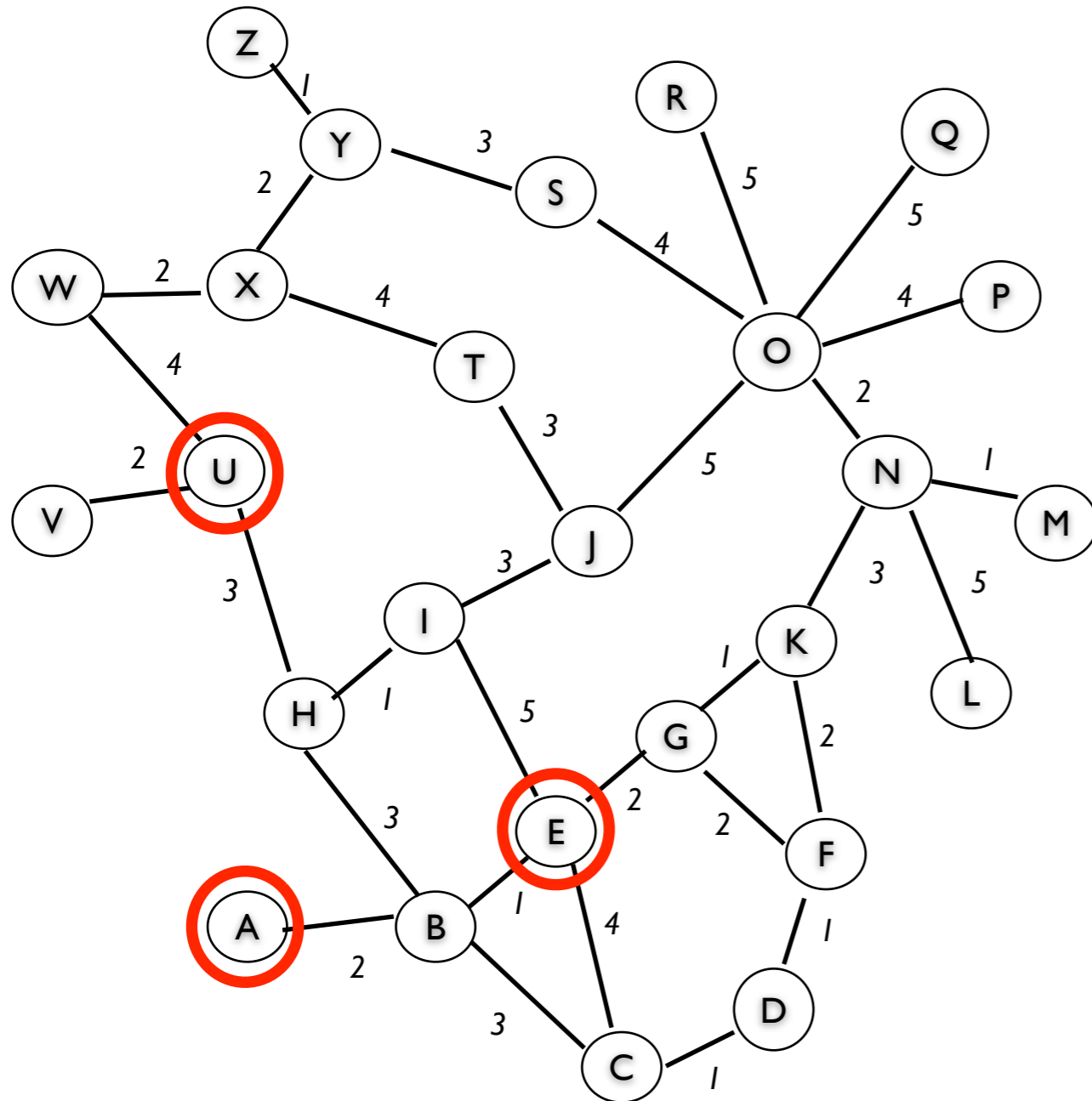
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



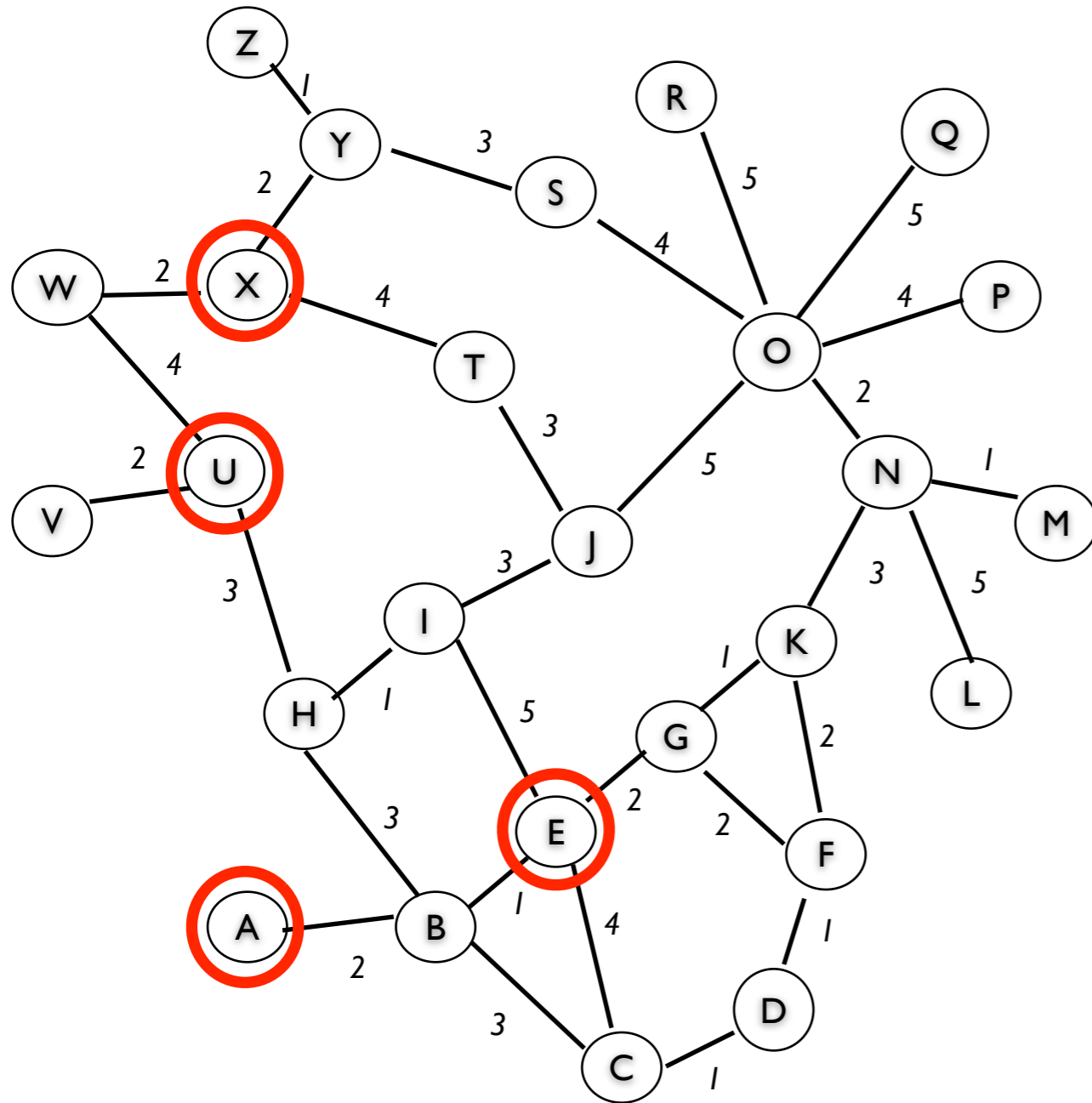
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



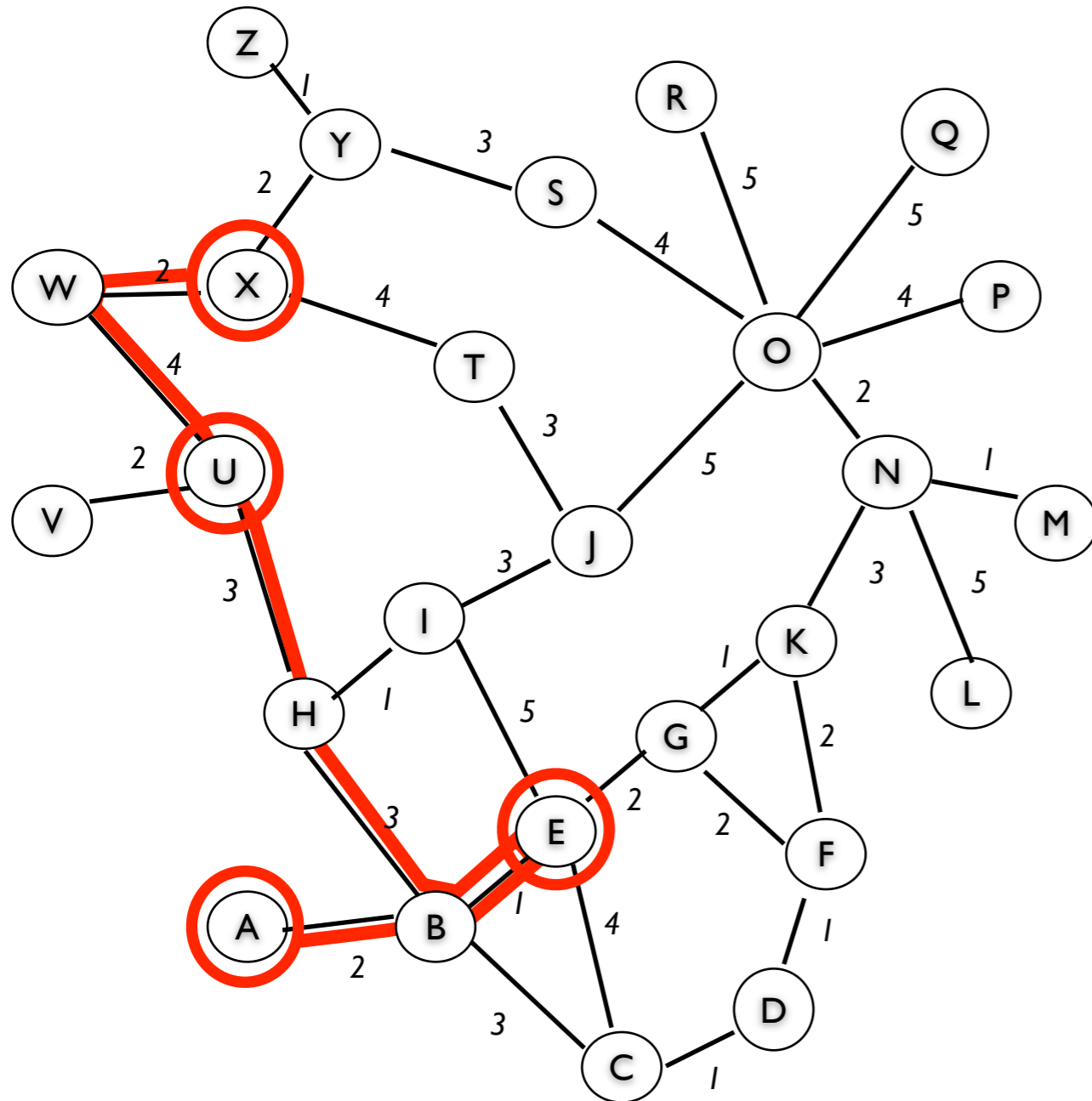
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



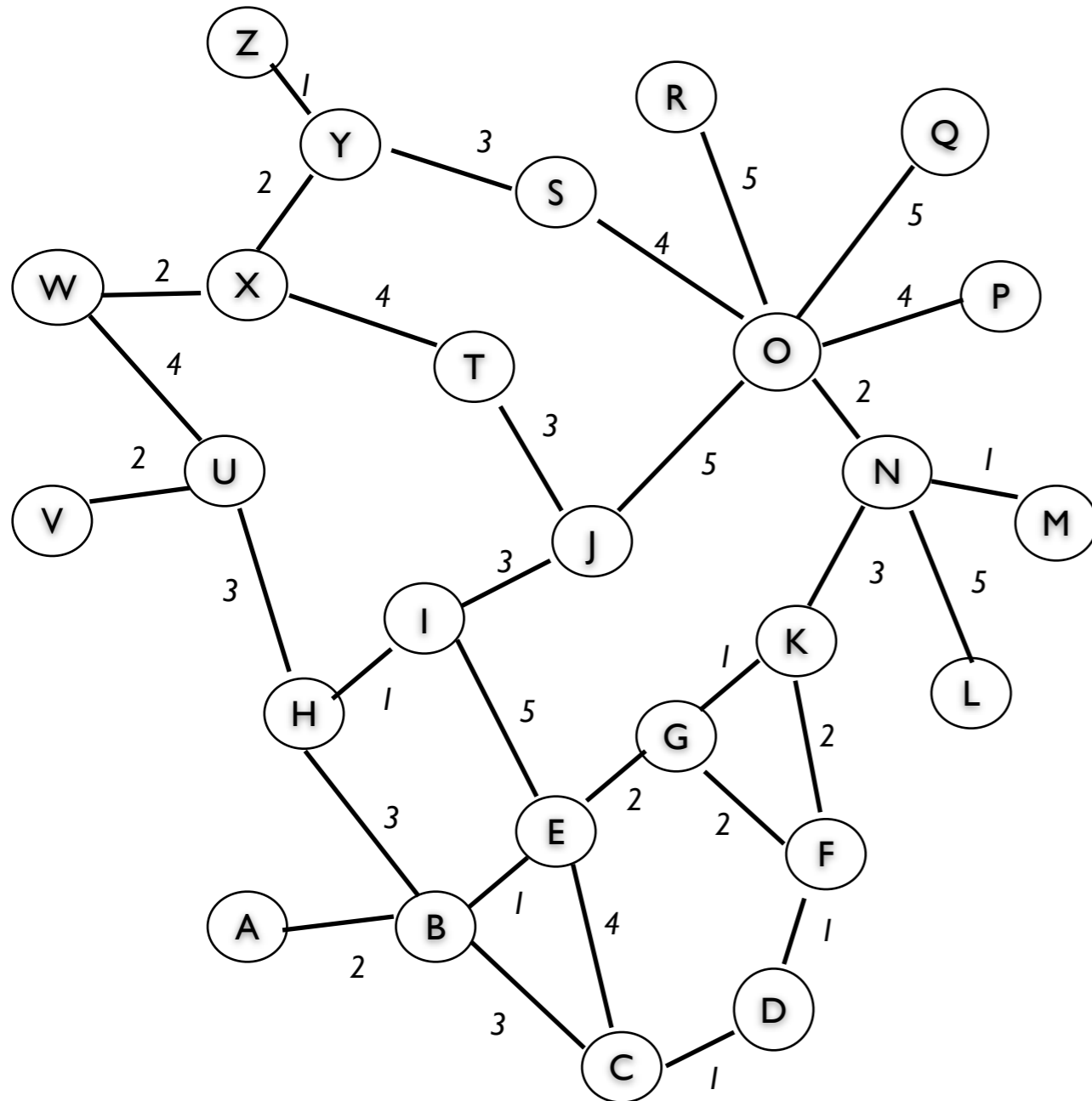
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



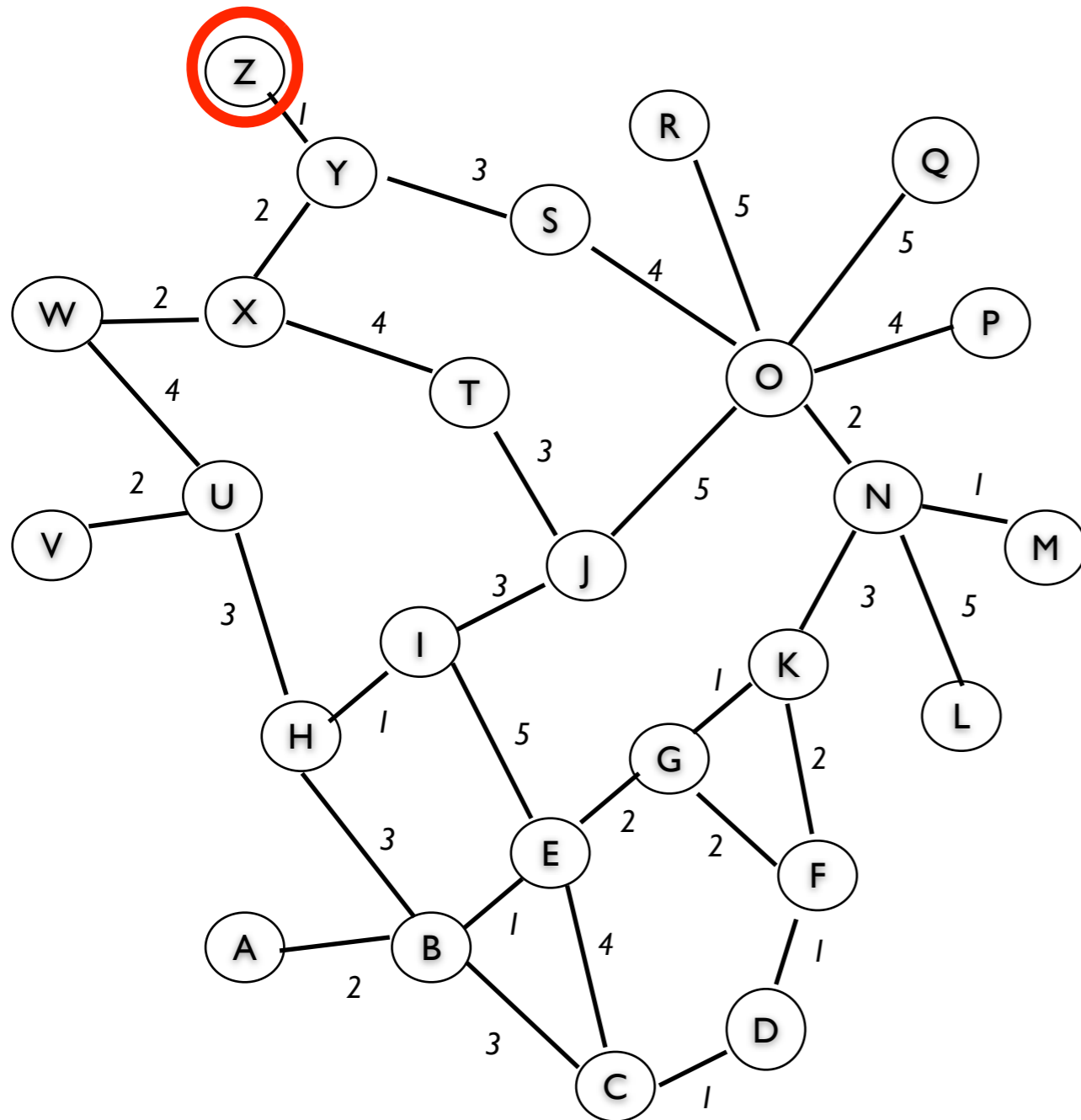
- Consider [A, E, U, X]
- Distance: [3,7,6] = 16
- Average Distance: 5.33

Playlist Cohesion Metric



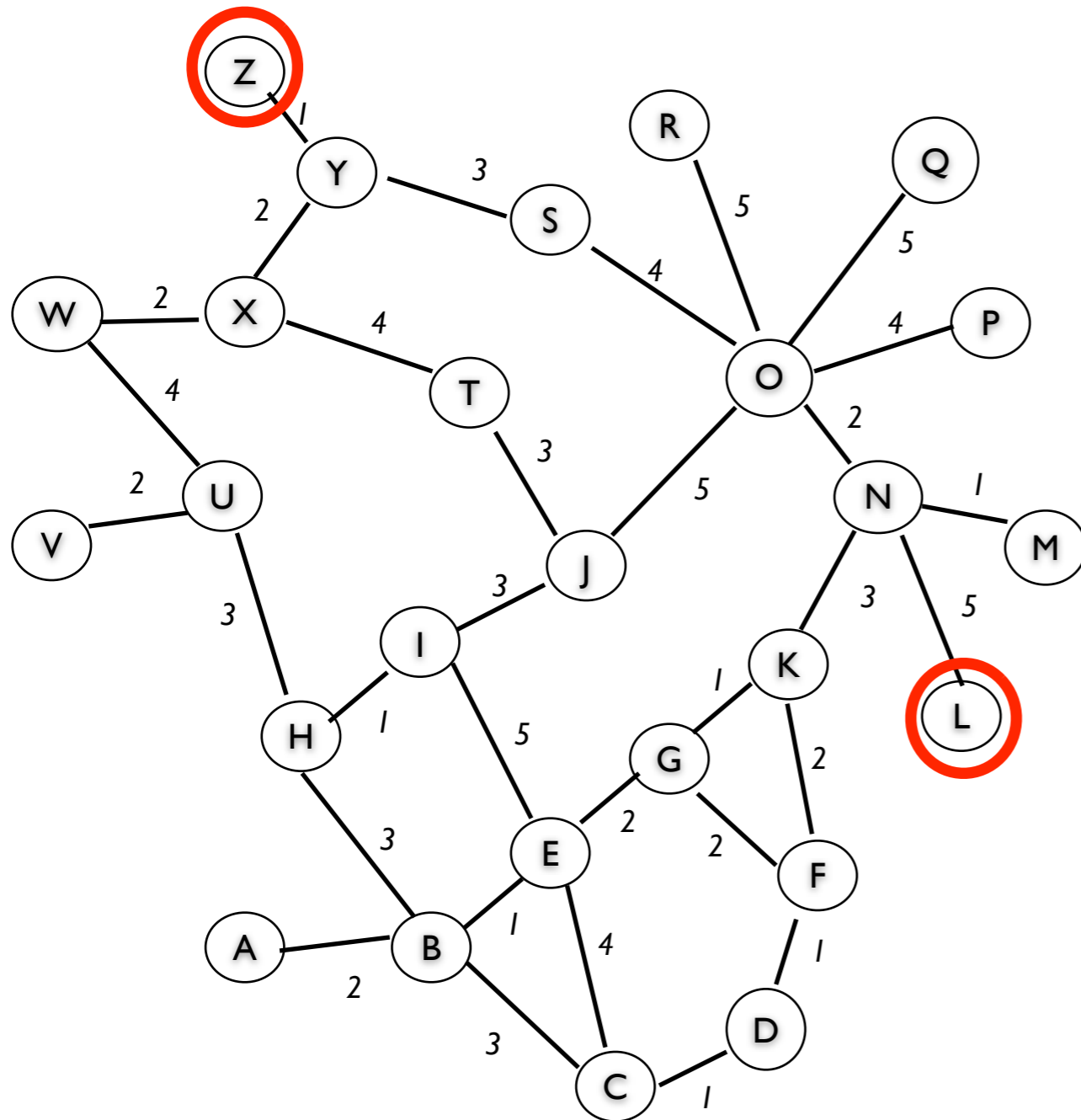
- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Playlist Cohesion Metric



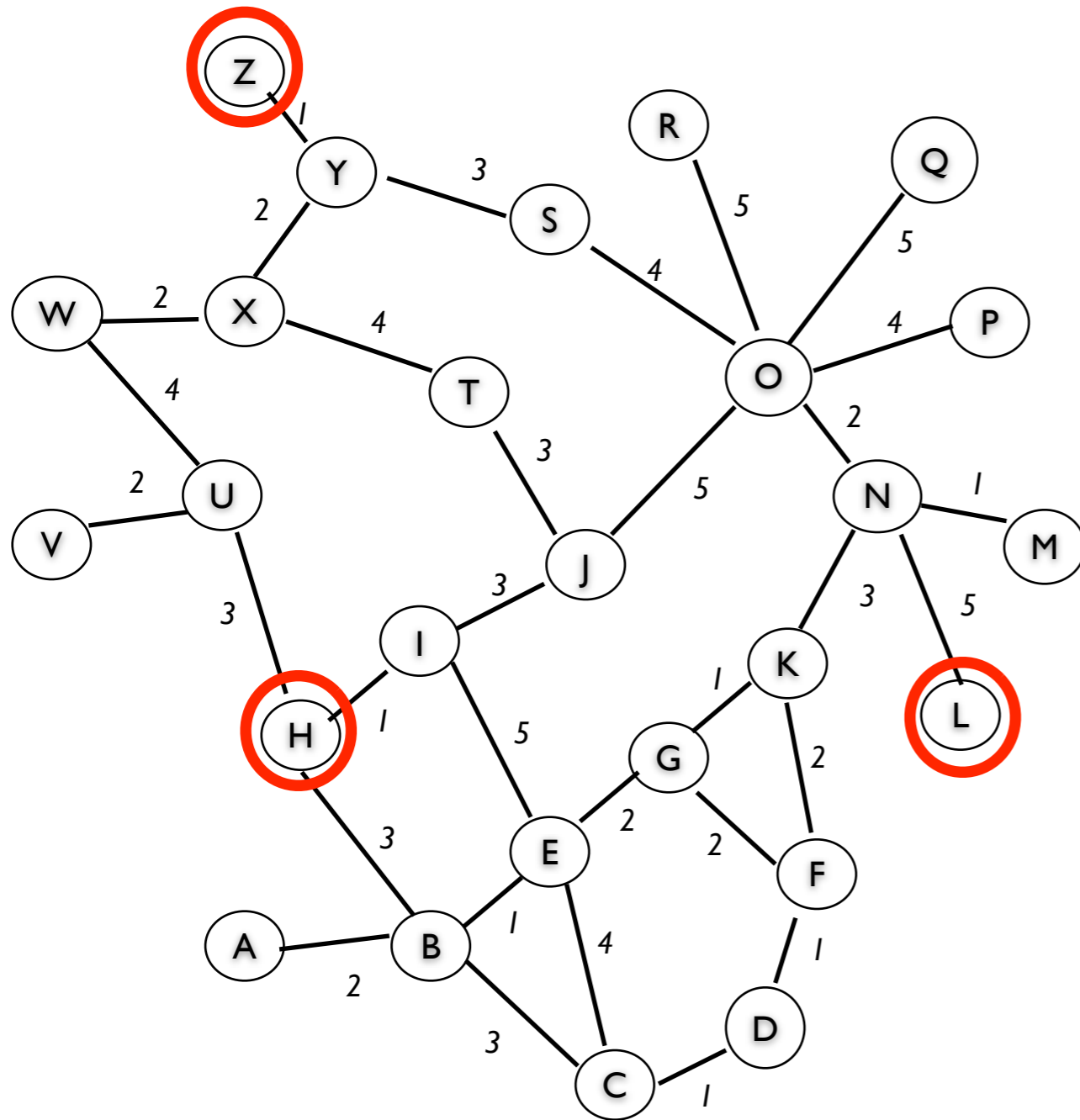
- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Playlist Cohesion Metric



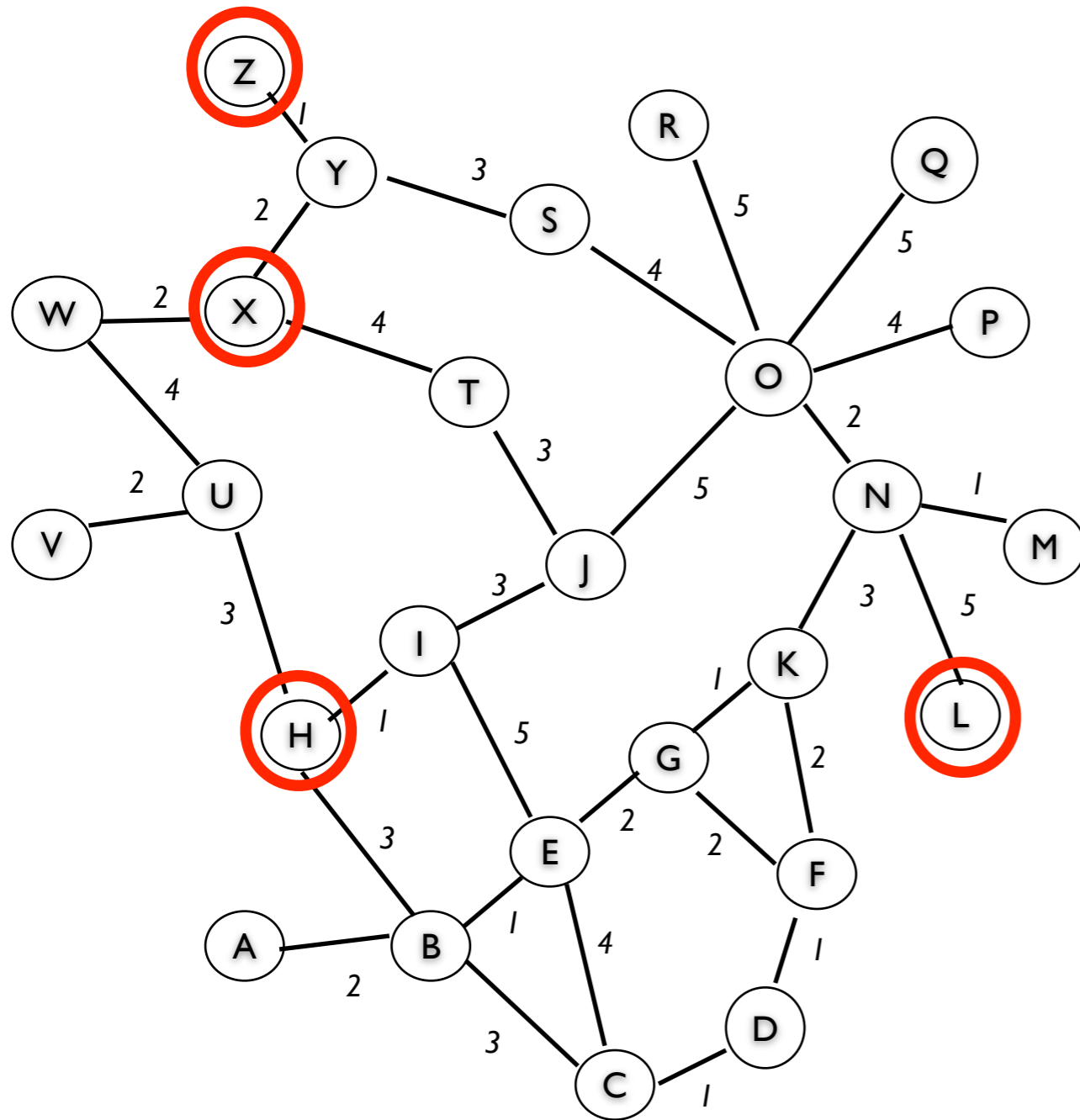
- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Playlist Cohesion Metric



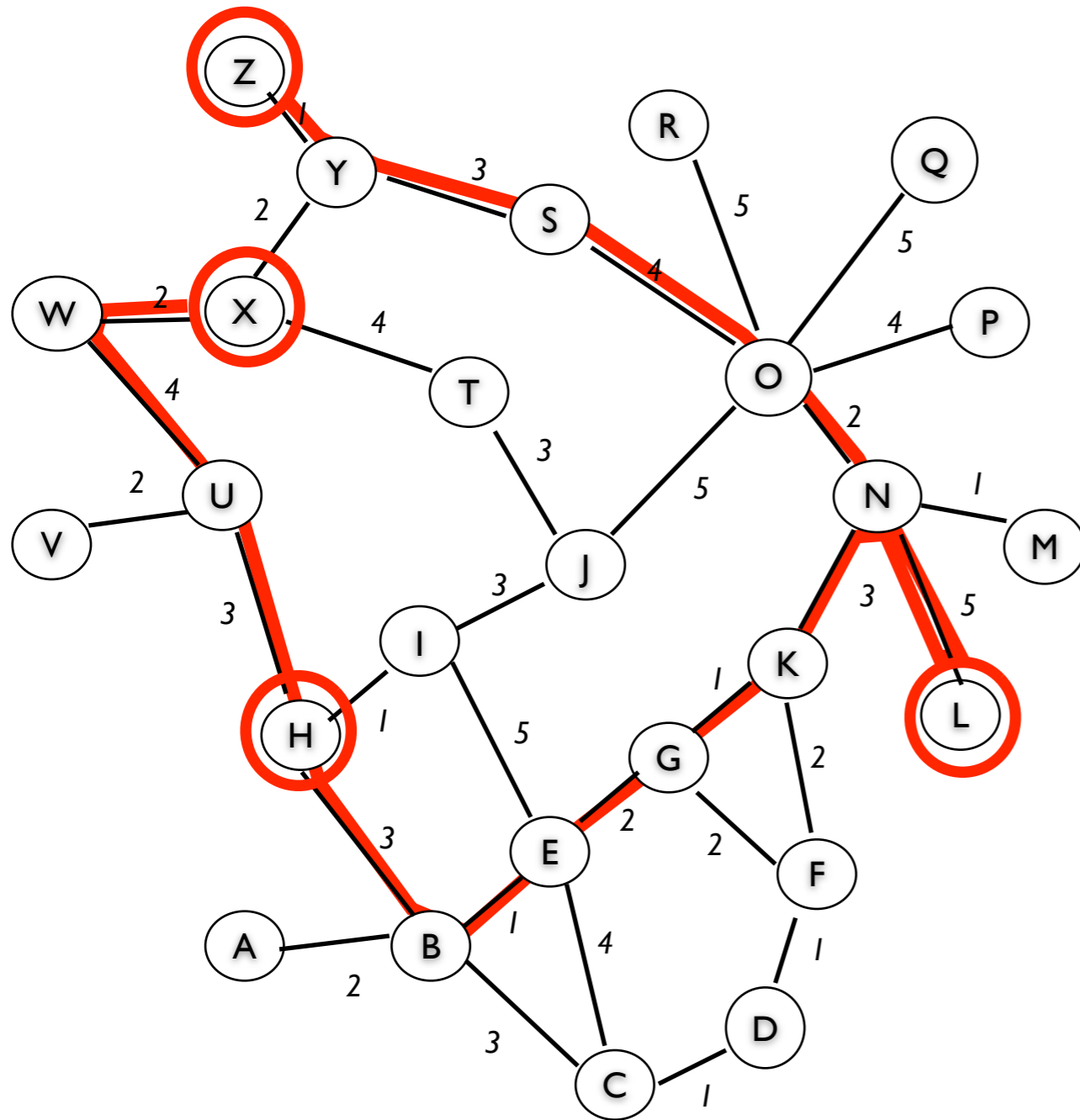
- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Playlist Cohesion Metric



- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Playlist Cohesion Metric



- Consider [Z,L, H, X]
- Distance: [15 , 10 , 9] = 34
- Average Distance: 11.3

Building the graph

MusicBrainz Artist Relations

- Nodes are artists
- Edges are relations, weighted by significance
- 132 Relationship types. some examples:

| Edge type | Weight |
|--------------------|--------|
| Is Person | 1 |
| Member of band | 10 |
| Married | 20 |
| Performed with | 100 |
| Composed | 250 |
| Remixed | 500 |
| Edited Liner Notes | 1000 |

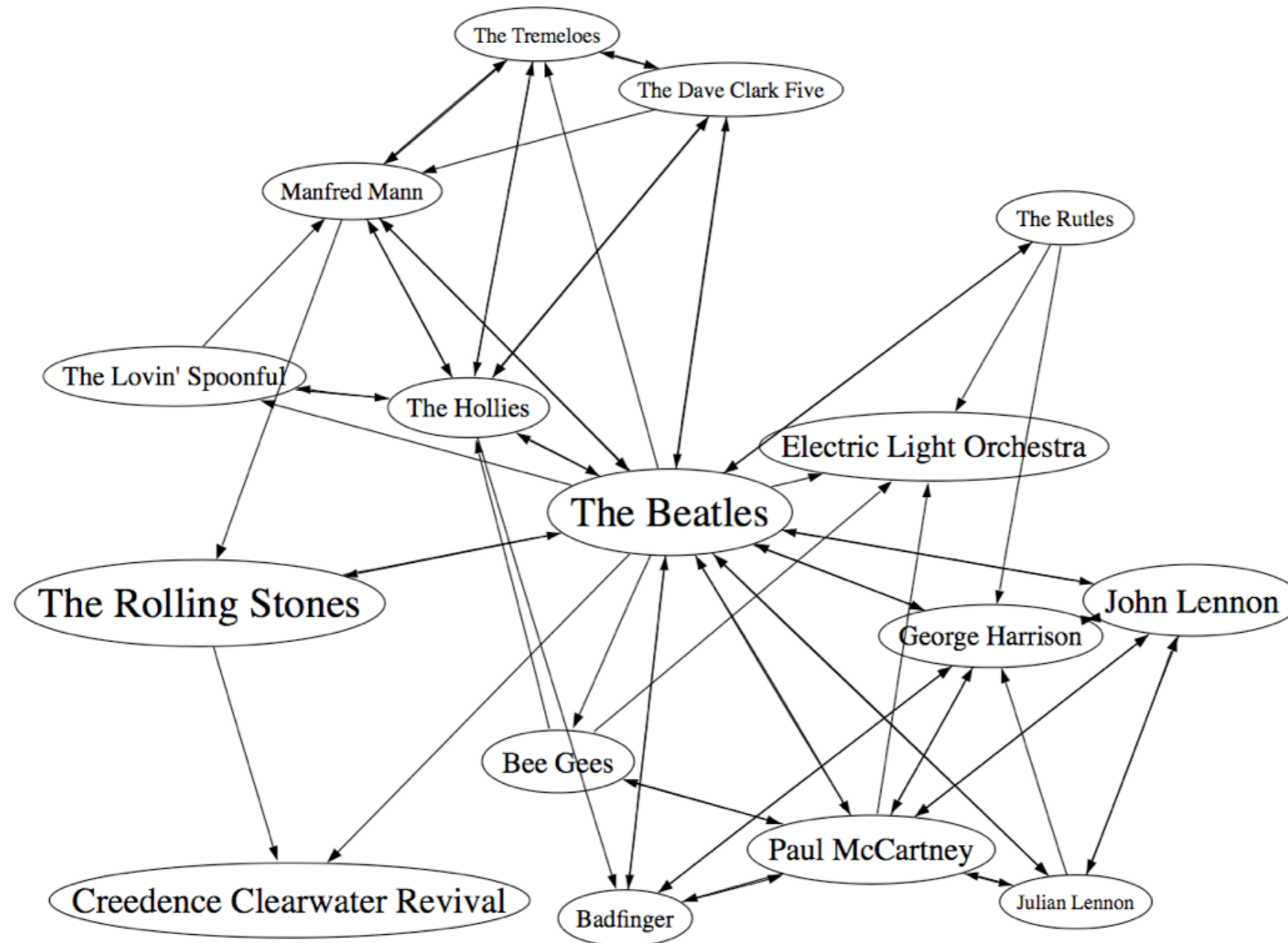
MusicBrainz Artist Relations Graph

| Source | Average inter-song Distance |
|----------------|------------------------------------|
| Radio Paradise | 0.08 / 0.06 |
| Pandora | 0.11 / 0.12 |
| MusicMobs | 0.13 / 0.10 |
| Art of the mix | 0.14 / 0.10 |
| Random (RP) | 0.27 / 0.22 |
| Random (graph) | 0.39 / 0.45 |
| Random (AotM) | 0.56 / 0.19 |

Building the graph

Echo Nest Artist Similarity

- Nodes are artists
- Edges are similar artists, weighted by similarity



Echo Nest Artist Similarity Graph

| Source | Average inter-song Distance |
|----------------|------------------------------------|
| Pandora | 1.57 / 1.4 |
| Radio Paradise | 2.27 / 1.0 |
| MusicMobs | 2.71 / 1.7 |
| Art of the mix | 3.02 / 1.4 |
| Random (RP) | 4.02 / 1.2 |
| Random (AotM) | 7.00 / 1.1 |
| Random (graph) | 7.89 / 1.78 |

The future of playlisting

DOUBLE-SIDED ROMANCE



Hybrid Radio

The Social Radio

- Produce playlists via weighted distance paths
- Next destination song is determined via a vote across all listeners
- Candidate songs selected from disparate communities

Hybrid Radio

Ratings


- Ratings are applied to the edge that lead to the song
- Song ratings \rightarrow playlist ratings
- Serving 2 purposes
 - Direct evaluation of playlists
 - Object based filtering

Hybrid Radio



Welcome to SoSoRadio!

CURRENT PLAYLIST

| | | |
|---|-----------------------------------|-------------------------|
| Fatboy Slim | Slim Tomatoes | |
| MIDFIELD GENERAL | Barry The Moth | |
| Tiga | Good as Gold | |
| CHROME0 | Tenderoni | |
| SINDEN | Lethal B Sinden Rmx | |
|  | M.I.A. PPRPLNS ryeryeAB | Rate This: not rated |
| Timbaland | The Way I Are | |
| Eve | Give It To You | |

WHAT WOULD YOU LIKE TO HEAR NEXT?

| | | |
|---|---|--|
|   ✓ PICK THIS |  ✓ PICK THIS |   ✓ PICK THIS |
|   ✓ PICK THIS |  ✓ PICK THIS |  ✓ PICK THIS |
|  ✓ PICK THIS |   ✓ PICK THIS |  ✓ PICK THIS |

[home](#) [about](#) [faq](#) [contact](#)

Convergence

When the cloud provide all the music and ubiquitous internet provides it all the time recommendation and playlisting merge

Convergence

The celestial jukebox needs a DJ.



The anonymous programmers who write the algorithms that control the series of songs in these streaming services may end up having a huge effect on the way that people think of musical narrative—what follows what, and who sounds best with whom. Sometimes we will be the d.j.s, and sometimes the machines will be, and we may be surprised by which we prefer

You, the D.J.

Online music moves to the cloud.

by Sasha Frere-Jones