

RecSys Workshop 2026

Musicgram

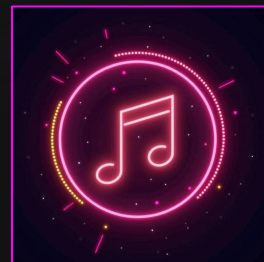
A collaborative music recommendation engine

Michael Neumann

Hila Etziony

Yiftach Peleg

Nadav Mann Oryan



Collaborative Music Recommendations



Collaborative Filtering > Rigid Genres

User tastes are varied, fluid, and dynamic. Traditional genres are too rigid to capture the nuance of true musical discovery.

Musicgram leverages a massive dataset of **75M** implicit real-world user interactions to find patterns in how real people listen and recommend based on those patterns.

Artists

Albums

Tracks



Core Product Features

1. Smart Onboarding

Personal profile creation, requiring artist, album, and track preference entry for “cold start”.

2. CF-based Recommendation Engines

Dedicated collaborative filtering engines for Artists, Albums, and Tracks, filterable by genre tags.

Artists

Albums

Tracks

3. Similar Item Search

Discovery of similar items to a specific **artist**/**album**/**track** based on our vectorization model.

4. Engagement-Based Profiling

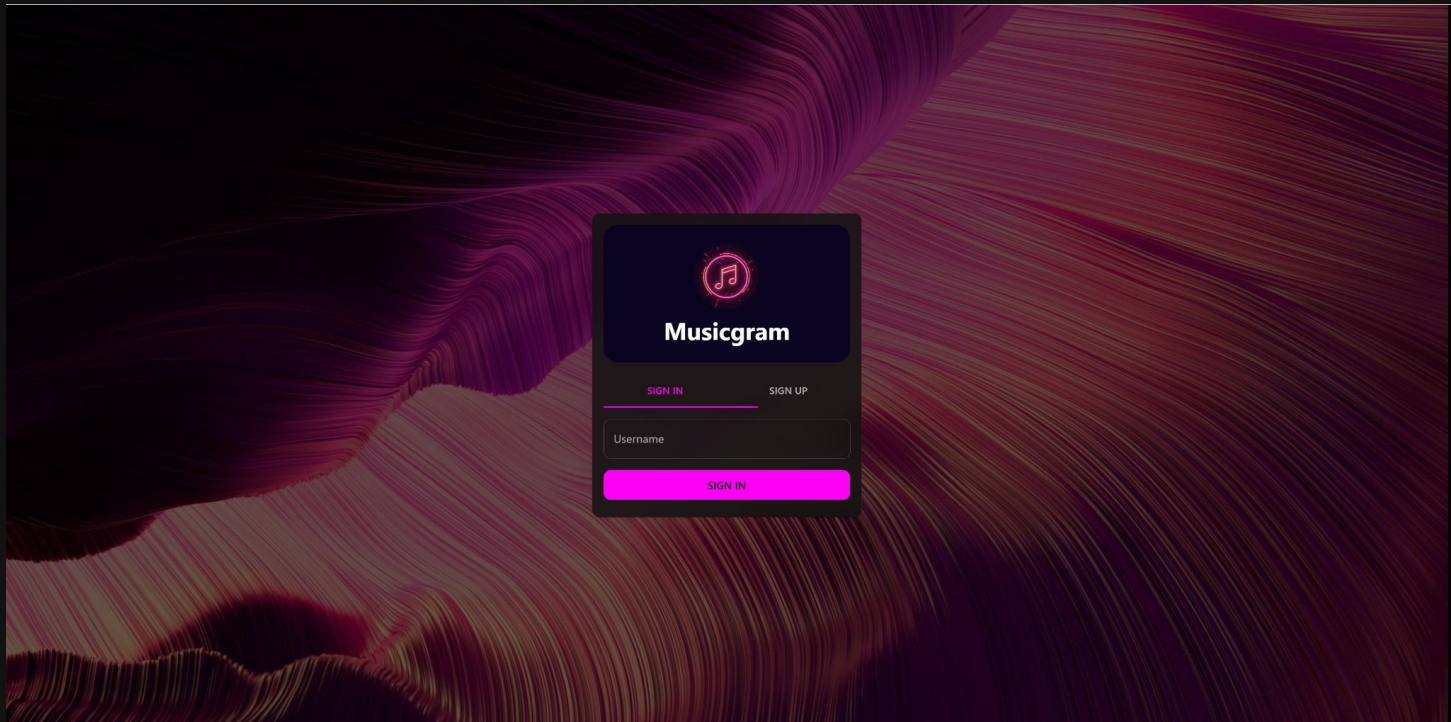
The website stores implicit user interactions and updates user profile preferences and tastes based on this engagement.

Live Demo



Landing Page

Landing Page



Feature #1

Smart Onboarding

A new user must enter their preference before entering the app. Pick 3 items you like in each category (artists, albums, tracks) via autocomplete, or hit "Choose for Me" to fill a category with random picks.

Welcome, LeBron!

Pick exactly 3 of each to get started.

Artists (3/3) CHOOSE FOR ME

3 selected

Taylor Swift Billie Eilish Beyoncé

Albums (1/3) CHOOSE FOR ME

Search albums...

Taylor Swift — Taylor Swift

Tracks (3/3) CHOOSE FOR ME

3 selected

Shake It Off — Taylor Swift Poker Face — Lady Gaga Landslide — Fleetwood Mac

Cancel FINISH

Home Page

 Musicgram

HOME

MY PROFILE

LeBron

SIGN OUT

Your Top Played

Artists

 Taylor Swift

 Billie Eilish

 Beyonce

Albums

 Taylor Swift

 Welcome to ...
Christian Kane

 Twilight of th...
Amon Amarth

Tracks

 Shake It Off
Taylor Swift

 Poker Face
Lady Gaga

 Landslide
Fleetwood Mac

Recommendations

Discovery 0% - adjust to explore new items

Artists you may like

All

alternative

rock

pop

indie

electronic

Lana Del Rey

The Weeknd

Paramore

Arctic Monkeys

Kanye West

Lady Gaga

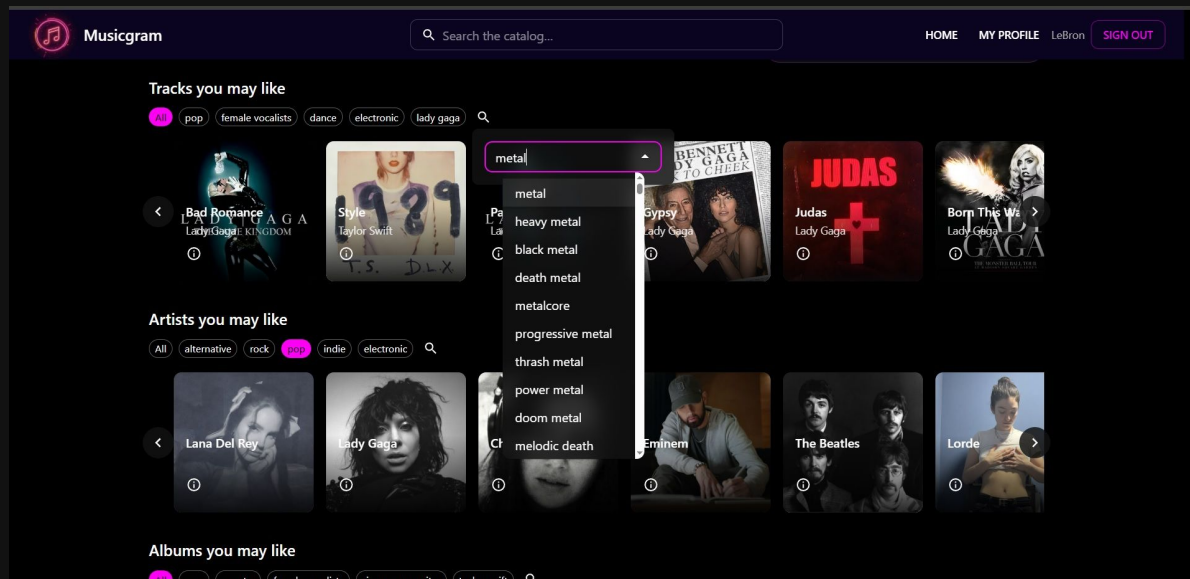
Albums you may like

Feature #2

Recommendation shelves & genre filtering

Dedicated collaborative filtering engines for Artists, Albums, and Tracks, filterable by genre tags.

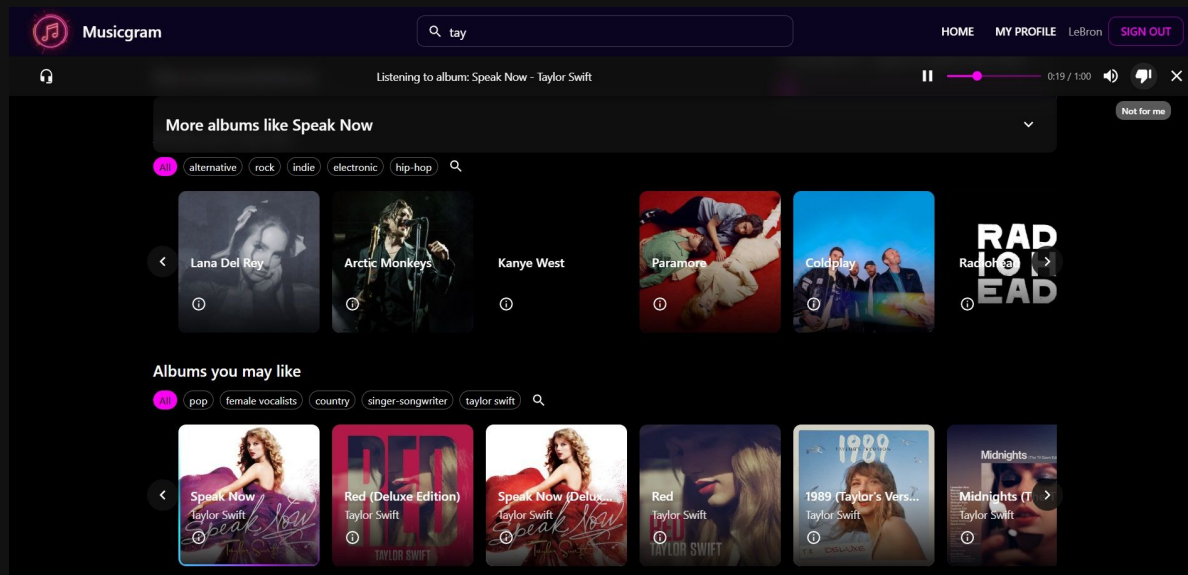
Each engine has genre filters: choose a genre from the options above or enter genre manually.



Feature #3

Listening Bar

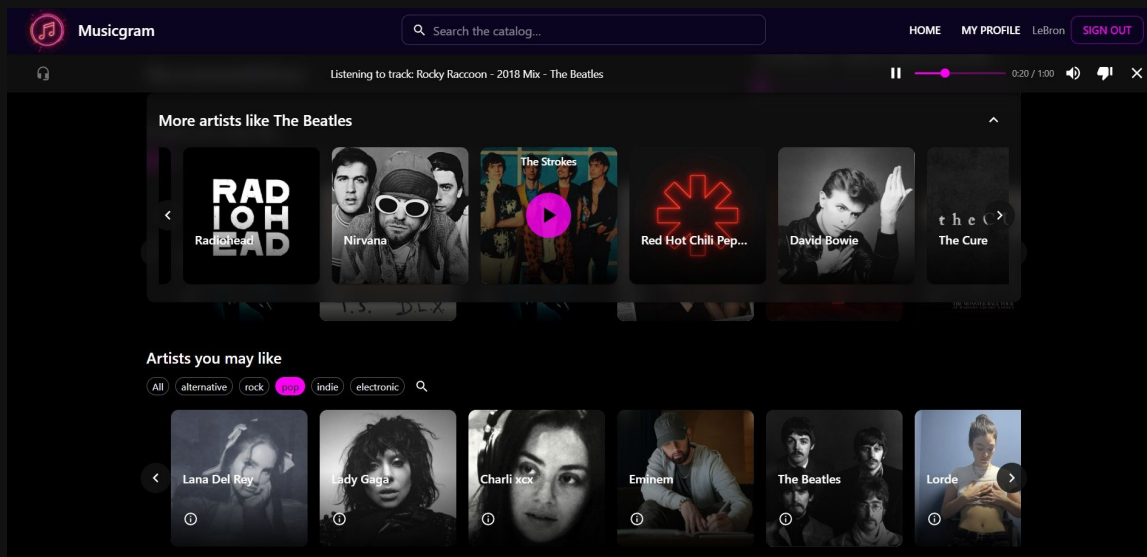
Playback bar with a 'Not for me' button.



Feature #4

Similar-items Carousel

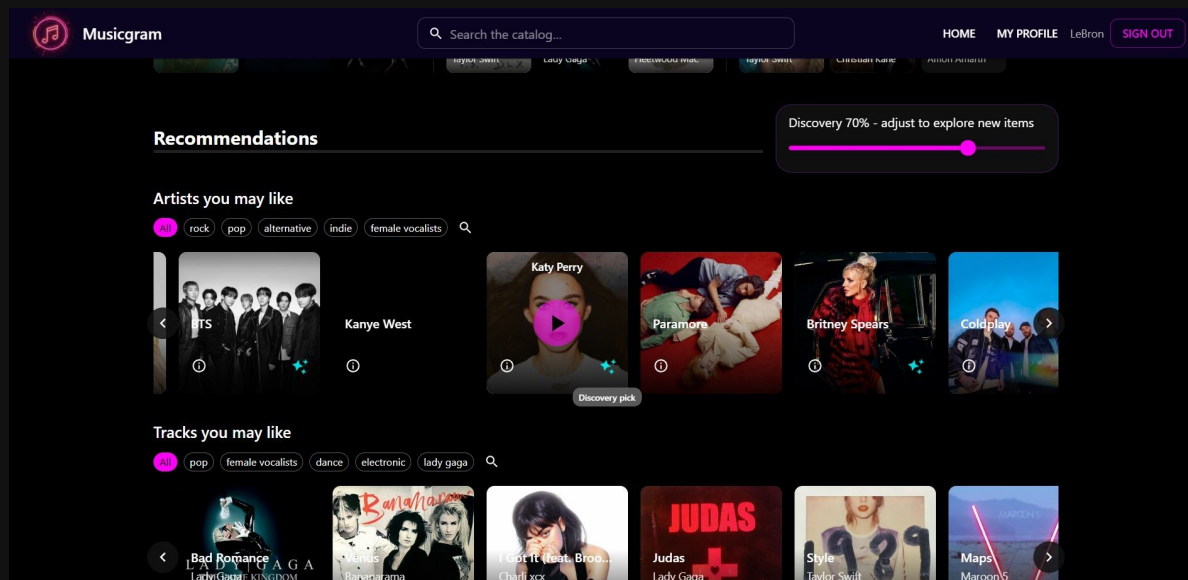
While something is playing,
a "More like {item}" carousel
suggests items similar to it.



Feature #5

Discovery Bar

A 0-100% discovery slider blends safe top recommendations with lower-ranked "discovery" items. Discovery picks are visually highlighted so adventurous suggestions stand out.



Profile & Catalogue Search

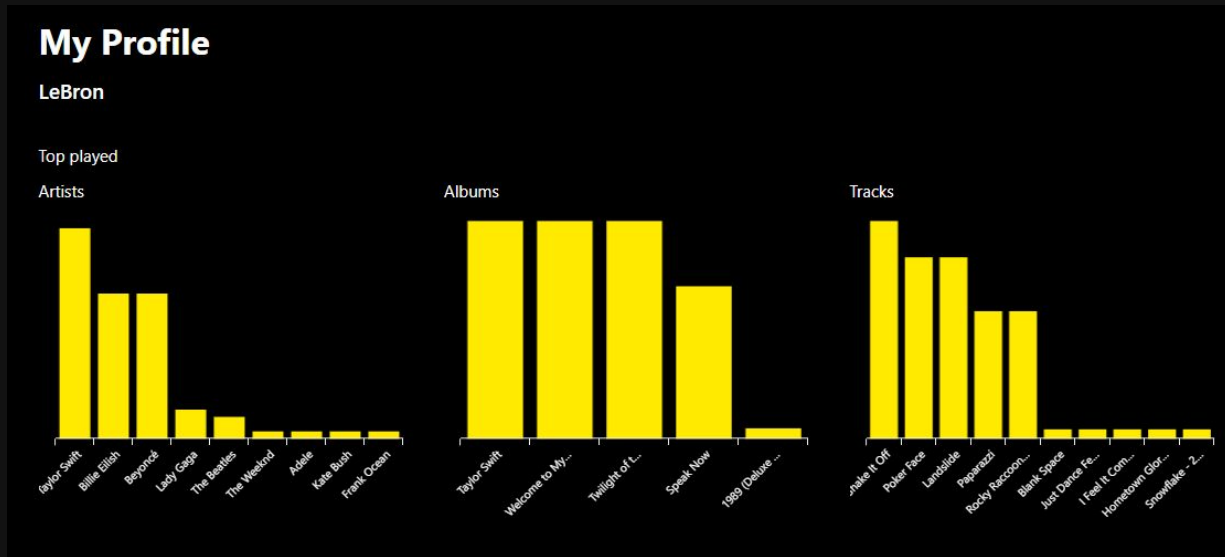




Engagement-Based Profiling

Every interaction updates an evolving taste profile stored in the user DB, with per-item weights that accumulate:

- Playing an item (a click on Play) adds +5.
- Listening past time thresholds during the simulated ~60-second play adds bonuses – +15 at 10s and +50 at 50s.
- Disliking an item ("Not for me") deletes it from the user's collection.
- Playing an artist or album auto-plays one of its tracks.
- Every play also credits the played item's artist and album.

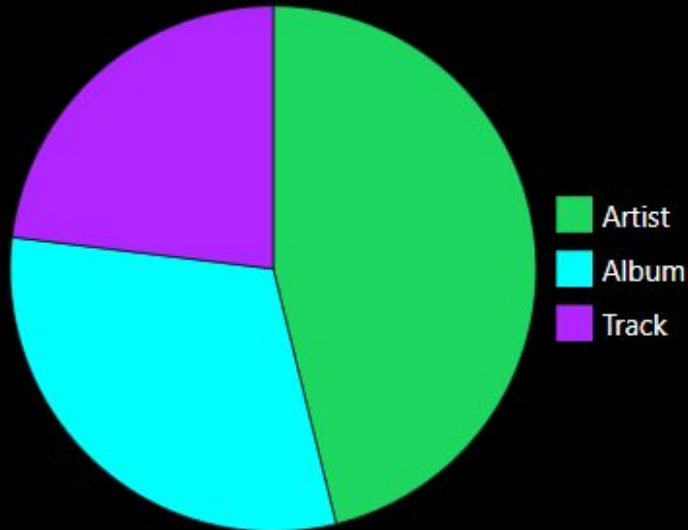




Engagement-Driven Shelf Order

Recommendation shelves on the homepage are ordered by the categories the user engages with most (per-category click counts), so the preferred category surfaces first.

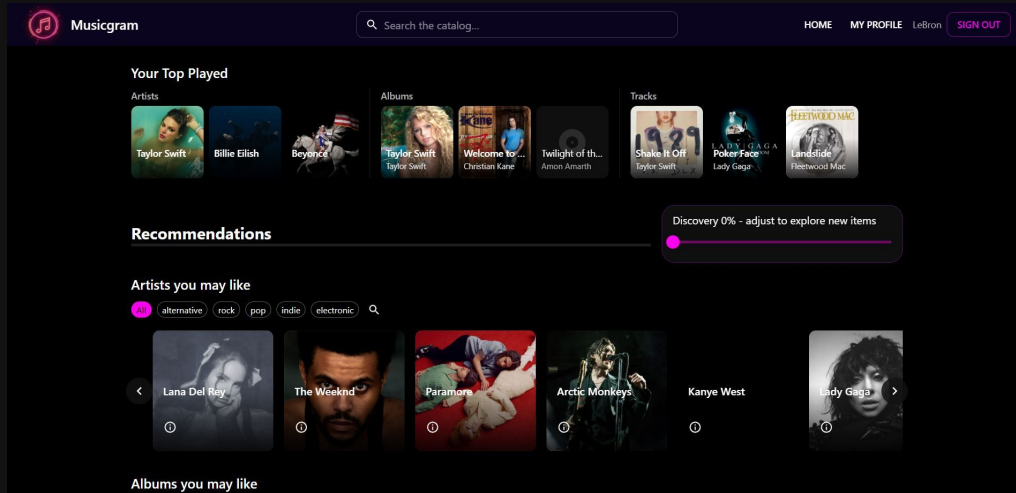
Category engagement



Feature #8

Live Cover-Art & Preview Enrichment

Missing covers and 30-second mp3 previews are filled on-demand with live requests to the Deezer public API.



Our Raw Data

Implicit user- artist / album / track interactions, based on and ranked by play counts



Semantic Genre Tags

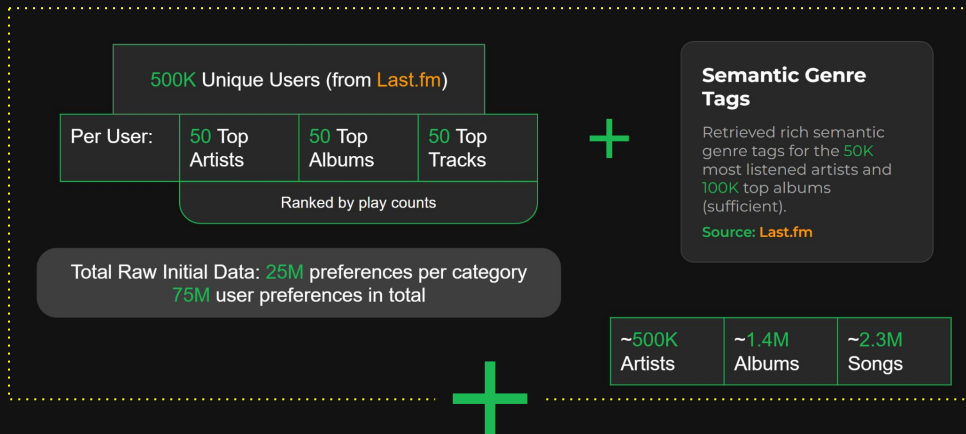
Retrieved rich semantic genre tags for the 50K most listened artists and 100K top albums (sufficient).

Source: Last.fm

Total Raw Initial Data: 25M preferences per category
75M user preferences in total

~ 500K Artists	~ 1.4M Albums	~ 2.3M Songs
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Cover Art and Audio Samples



Track - Album Links

Retrieved track lists of top 100K albums and matched tracks to parent albums.

>400K tracks matched.

Source: Last.fm

Cover Art

Retrieved cover art of top 100K albums.

Source: Last.fm

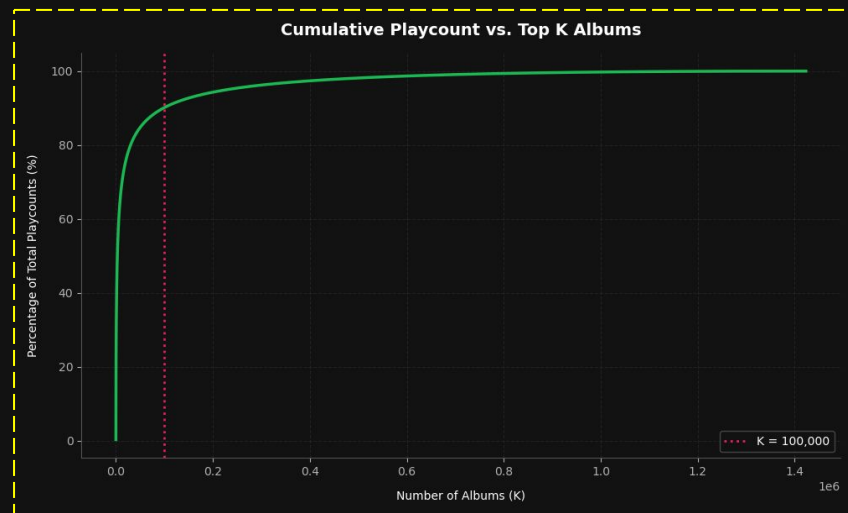
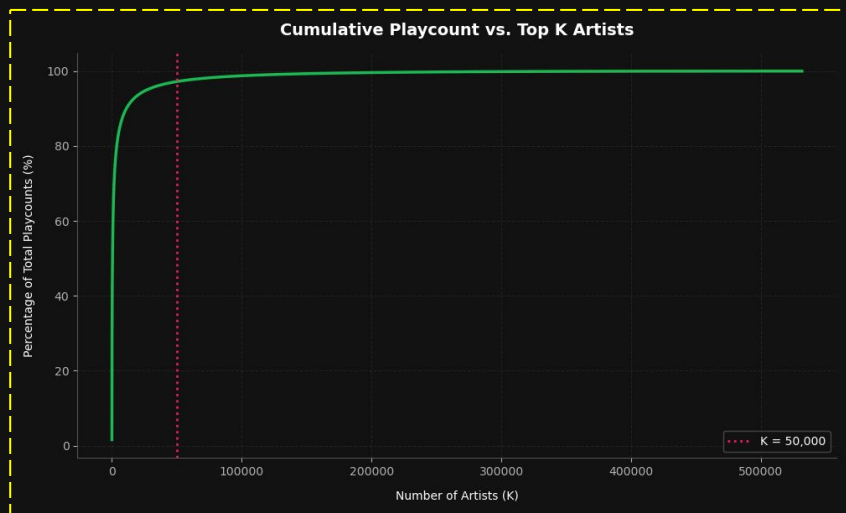
Cover Art Fallback & Audio Samples

Dynamically retrieving and caching missing cover art and audio samples.

Source: Deezer



Pareto Charts - Top Artists & Albums



In summary: partial semantic data is **sufficient!**



Recommendation Engine



Matrix Factorization

Highly **scalable** approach that fits our massive, sparse datasets perfectly.



ALS Algorithm

Alternating Least Squares:
Fast, efficient, and stable for implicit feedback.



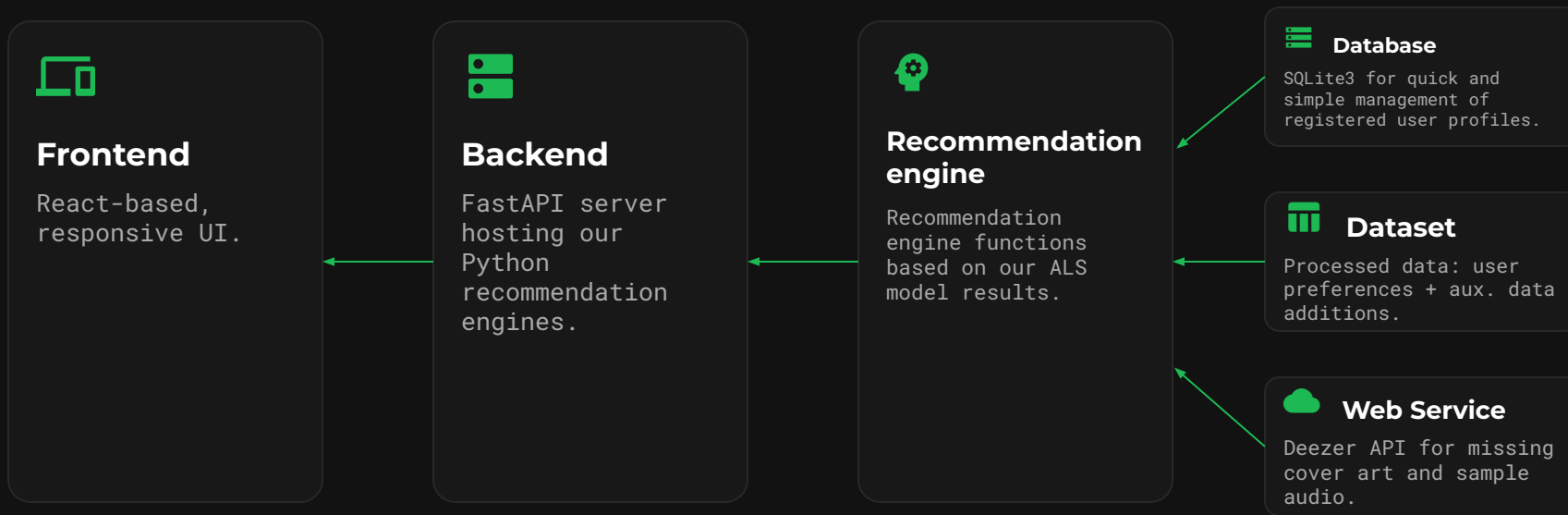
Model Evaluation

Optimized using **NDCG** metric. Hyperparameters tuned up to hardware and time limits.

Core engine powered by the **"implicit"** Python library.



Overall Architecture



“Roadmap”



Potential Future Developments

01. Clean up the data - standardize catalog.
 02. Scrape and integrate additional high-quality data.
 03. Scale up (distributed architecture, retraining model, etc.)
 04. Additional user features: user library, playlists, playback queue, etc.
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