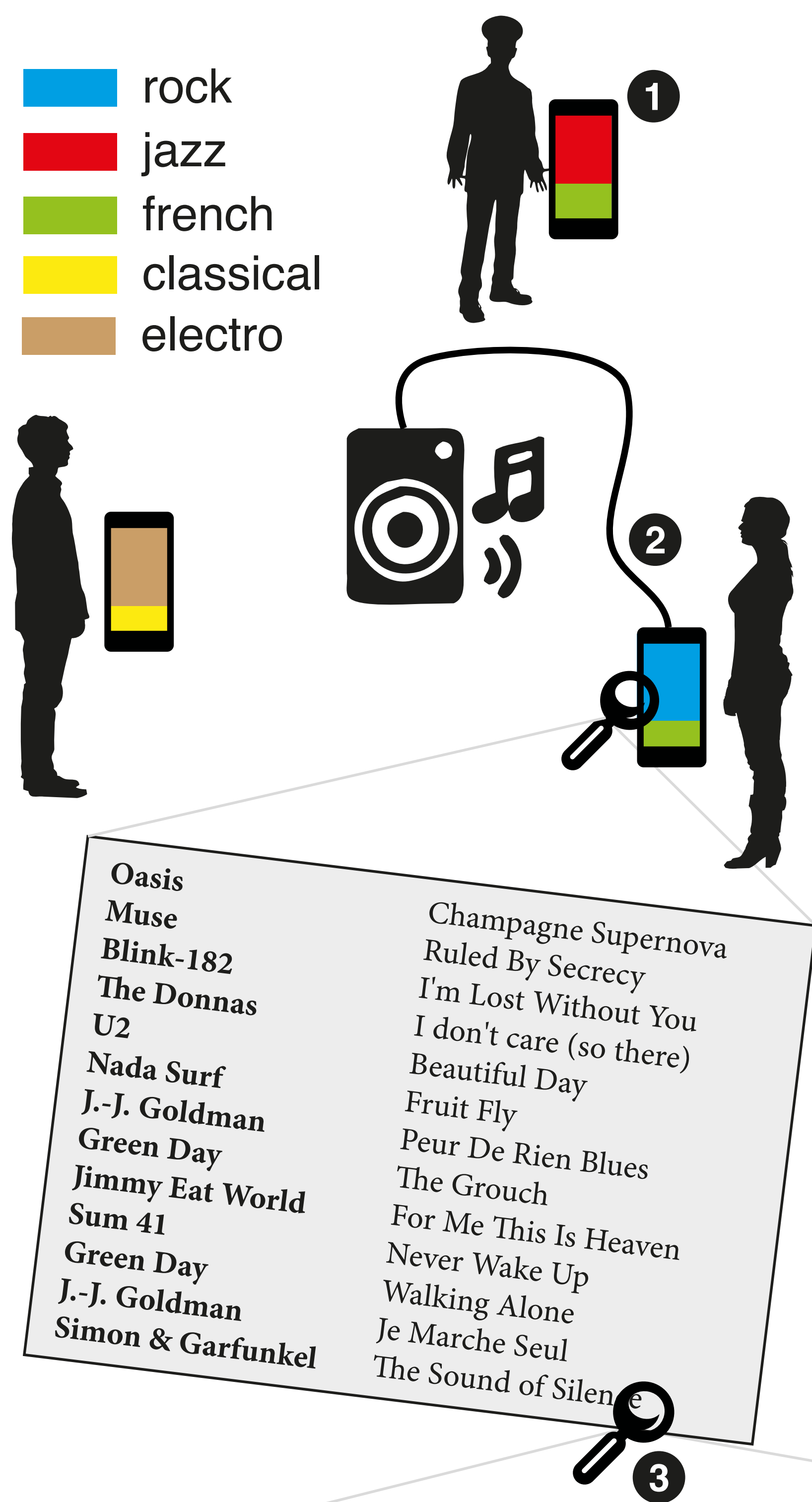# GroupStreamer
Recommending Music to Groups

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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

- rock
- jazz
- french
- classical
- electro

Imagine that you invited a few friends over to dinner and you are wondering which music to play.

GroupStreamer tries to play the music that is most likely to please the entire group.

1 Members hopefully share some musical tastes. But they don't need to have any song in common.

2 A single member of the group plays the music

Challenges: huge variety of songs, few metadata available beyond artist & title.

3 For each song, we get a list of keywords from a third party service.

Oasis
Muse
Blink-182
The Donnas
U2
Nada Surf
J.-J. Goldman
Green Day
Jimmy Eat World
Sum 41
Green Day
J.-J. Goldman
Simon & Garfunkel

Champagne Supernova
Ruled By Secrecy
I'm Lost Without You
I don't care (so there)
Beautiful Day
Fruit Fly
Peur De Rien Blues
The Grouch
For Me This Is Heaven
Never Wake Up
Walking Alone
Je Marche Seul
The Sound of Silence
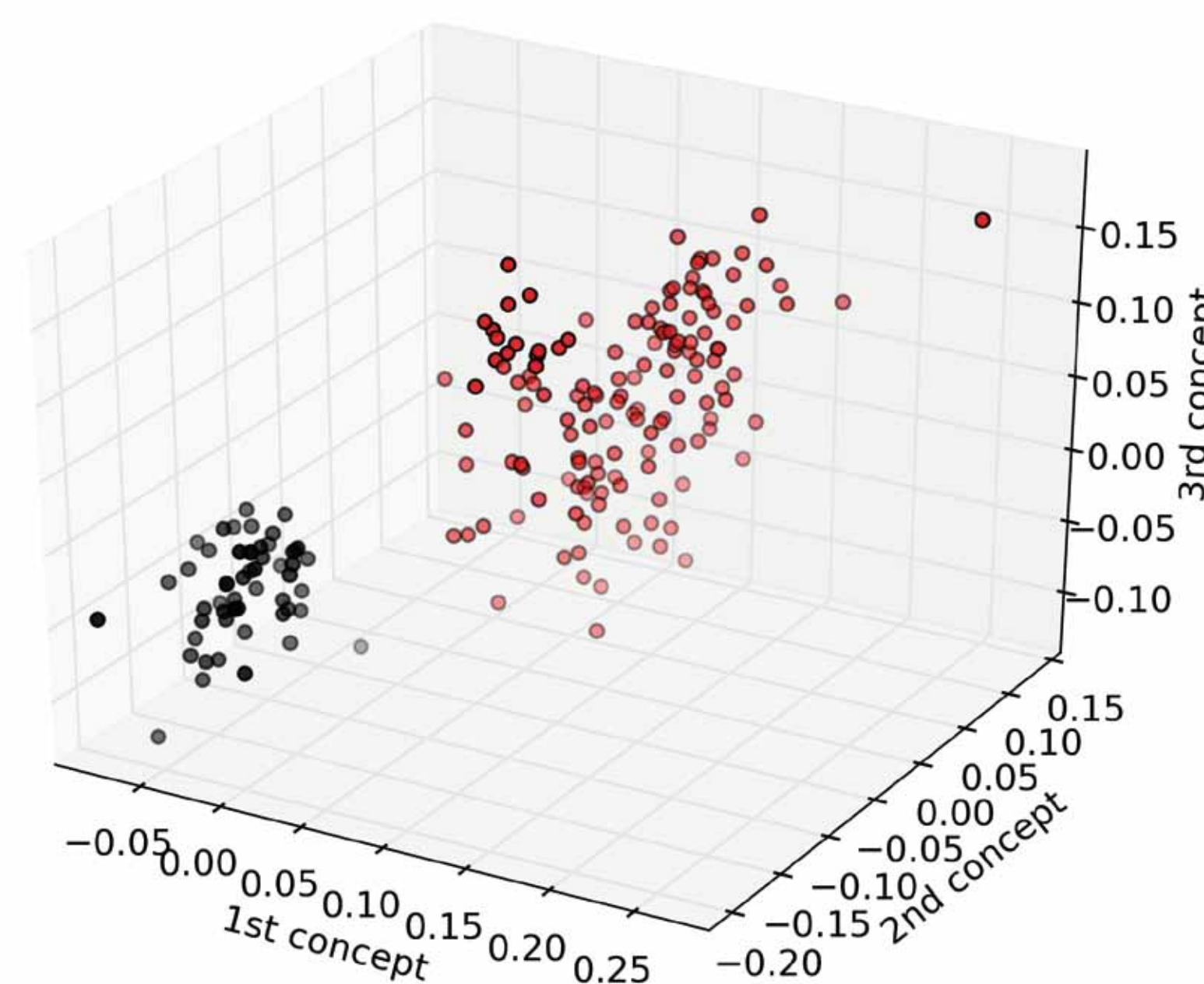
Latent Semantic Space

Fig. 1: rock and jazz songs

The number of distinct tags is large (several hundreds of thousands). We use **latent semantic analysis** to express the songs in a much smaller **concept space**.

$$\hat{A} = U_L \cdot \Sigma_L \cdot V_L^\top$$
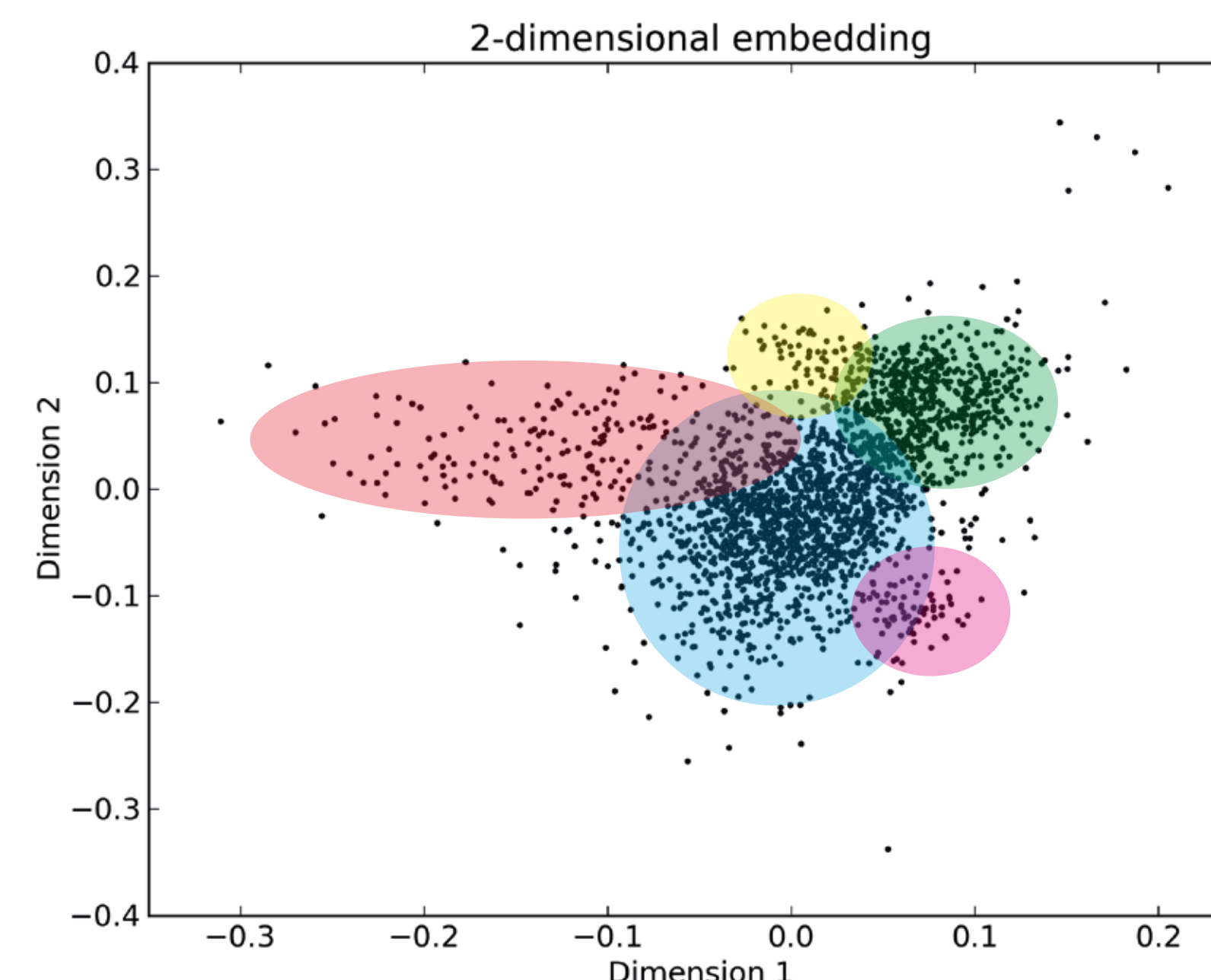
Modelling User Preferences

Fig. 2: 2D representation of a musical library

Users' music tastes are **modelled automatically** based on their musical library. We assume that preference is proportional to the **density of tracks**. We model the density using a Gaussian mixture model.

$$P = \sum_{k=0}^{K} w_k \cdot \mathcal{N}(\boldsymbol{\mu}_k, \Sigma_k)$$
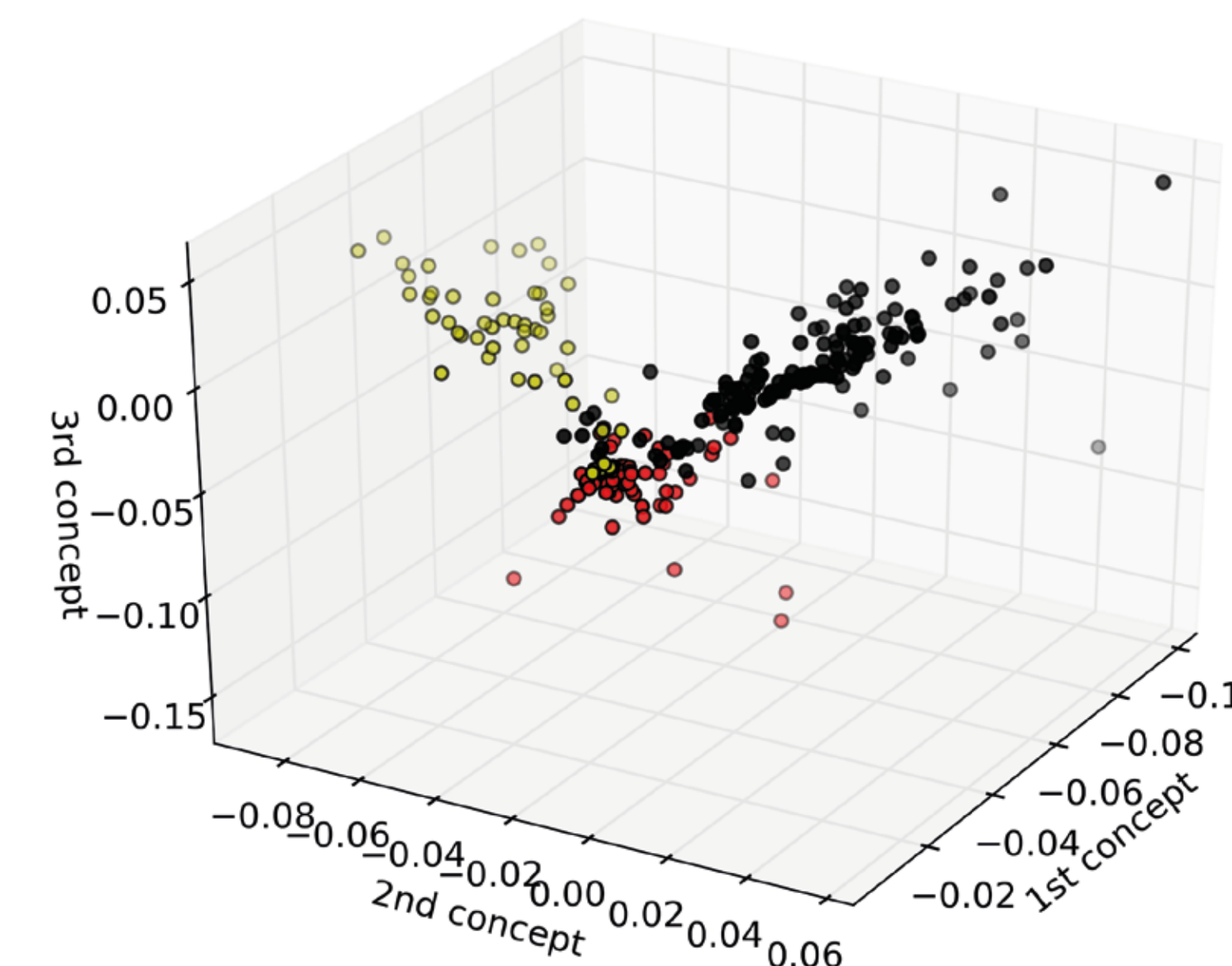
Aggregating Preferences

Fig. 3: superposition of musical libraries

Once we have estimated the users' preferences, we still need to reach a decision for the group. We try to **maximize average satisfaction** while still trying to ensure some level of **fairness**.

We plan to investigate a variety of aggregation strategies.
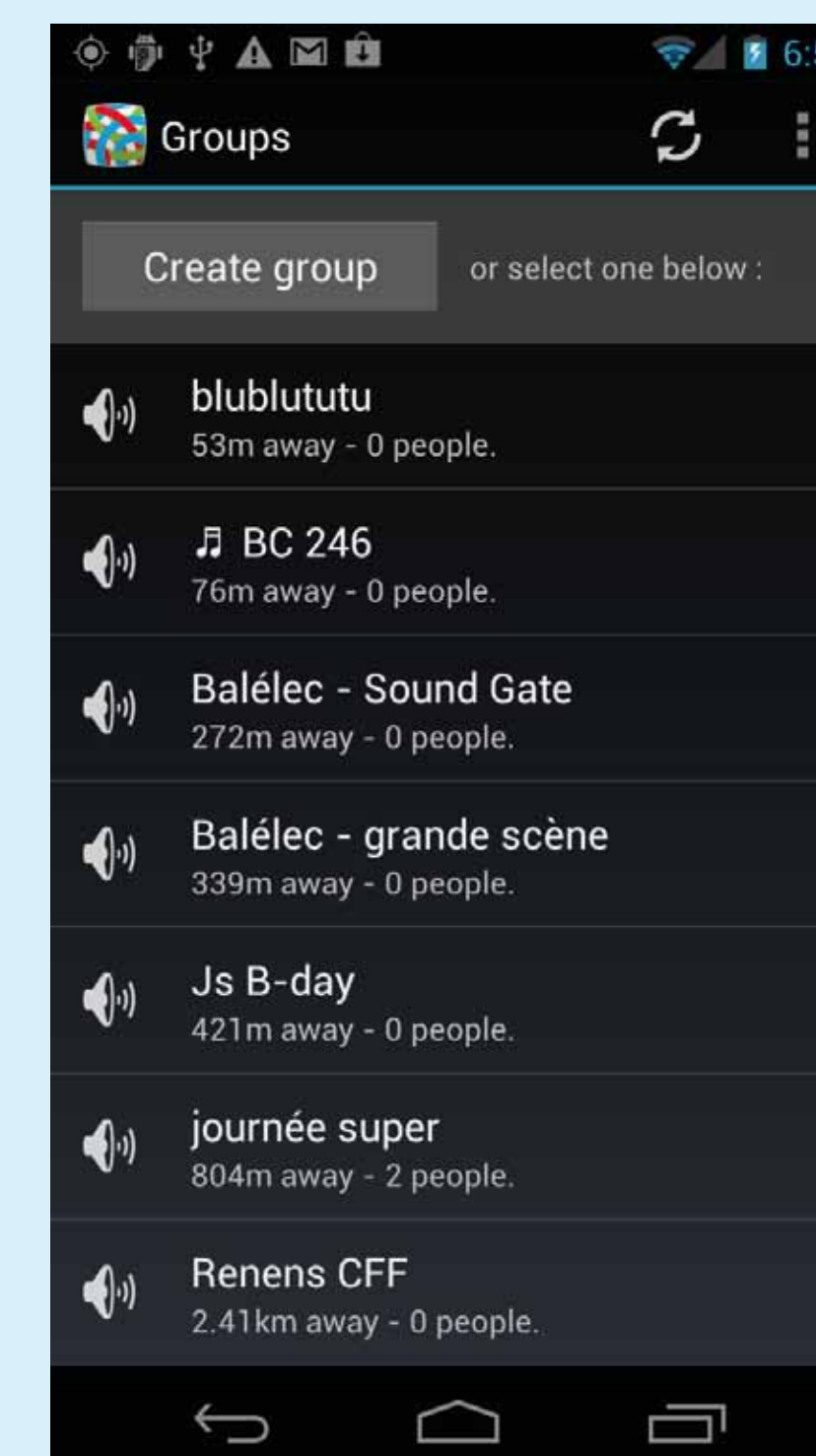

Android app

We developed an application for the Android mobile platform. It automatically uses the music you already have on your device.

The recommendations are computed on a remote server. We also plan to explore decentralized approaches.

Create a group and invite your guests.

Decide who is providing the music, and hit play.

Check out the predicted ratings

App available NOW !
Get it on Google Play or visit our website:
groupstreamer.com