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.

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

A single member of the group plays the music.

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

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

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.

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**GroupStreamer**

**Recommending Music to Groups**

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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**

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.

$$P = \sum_{k=0}^{K} w_k \cdot N(\mu_k, \Sigma_k)$$

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**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.

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**Aggregating Preferences**

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.

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**Fig. 1**: rock and jazz songs  
**Fig. 2**: 2D representation of a musical library  
**Fig. 3**: superposition of musical libraries