Group 25_5 - Cassandre Lambert - 2244308

Research Question: "Can visual analytics reveal the hidden evolution of musical genres beyond marketing labels?"

Emotional and Structural Evolution of Modern Music (1970-2020)

Data & Preprocessing Pipeline

Raw Data

01

Spotify Tracks Dataset :

- 18 dimensions
- 100k Tracks

Cleaning

02

9 numerical audio features are selected.

Normalization

03

Applying a **Z-Score normalization** to ensure they contribute equally.

$$z = \frac{x - \mu}{\sigma}$$

DR (PCA) & Clustering (K-Means)

04

PCA :

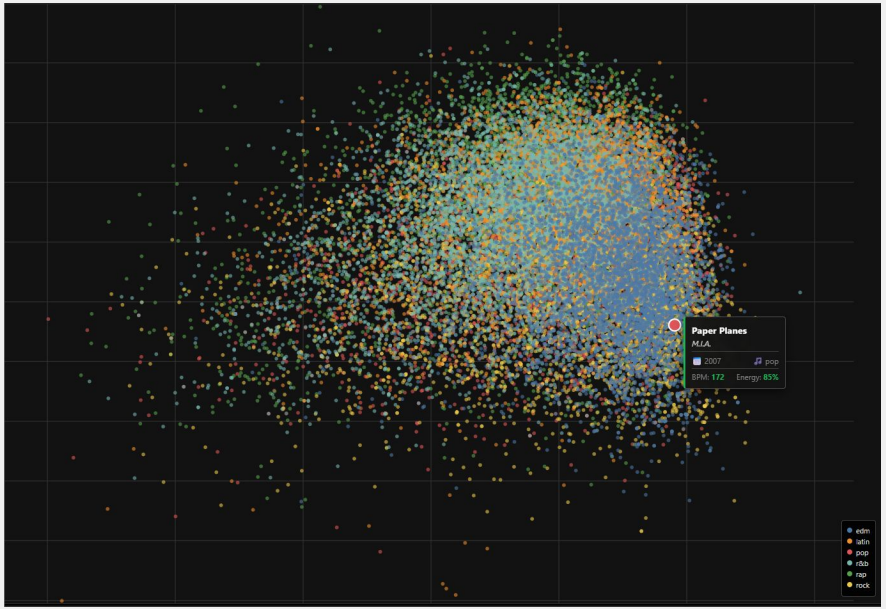
- 9 dimensions into 2D model

K-Means clustering :

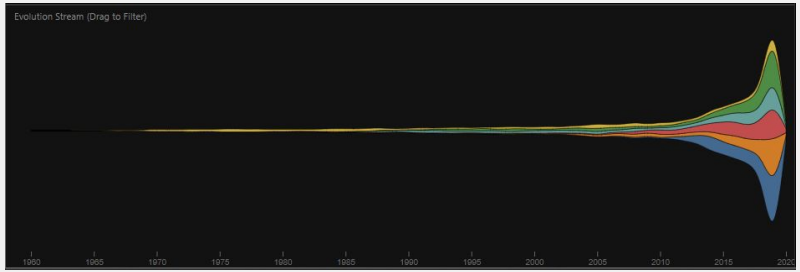
- Find natural groups of songs based on their actual sound, not just their genre.

Visual Design & Interaction

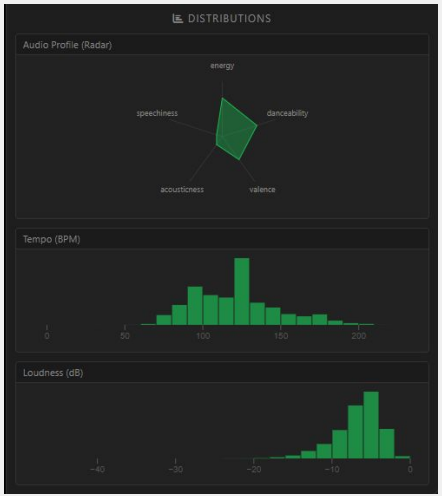
"Overview first, then details-on-demand" - Shneiderman's Mantra



1. The Main View : Scatterplot



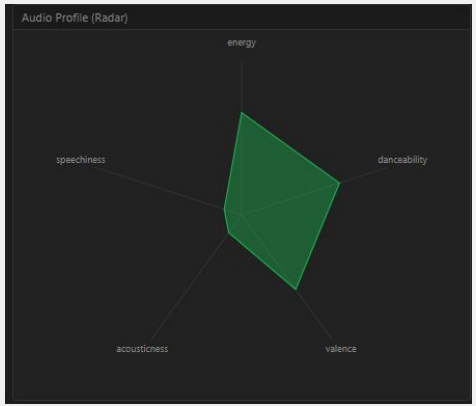
3. Temporal View



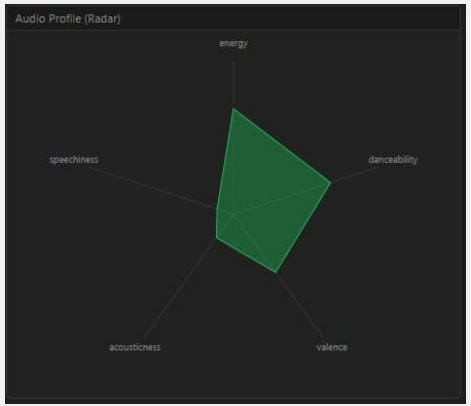
2. Analytics Panel

Insights (Results)

Insight 1 : “The Sadness of Modern Music”



1990 - 1999

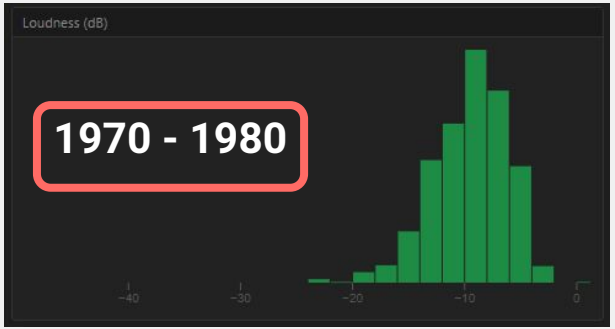


2015 - 2020

“While Mainstream music became louder, it also became significantly sadder.”

Insight 1 : “Loudness War”

1970s VS 2010s, shift in the loudness distribution towards higher decibels : Loss of Dynamic Range



Conclusion & Limitations

- ✔ Successful dimensionality reduction (PCA).
- ✔ Real-time interaction (no latency).
- ✖ Limitation: Subjectivity of genre labels.
- ✖ Limitation: Fewer Tracks available before the 2000s

Thank you for your attention !

Next : DEMO TIME