

Play like DJ
with Deep
Learning

March 23, 2020



Music App for DJs

Music recommenders in the market only for **general listeners**

- ▶ Collaborative filtering
User preference
- ▶ Content-based filtering
Genres, artists..

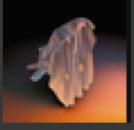
It's time to have a cool music app for **DJs!**

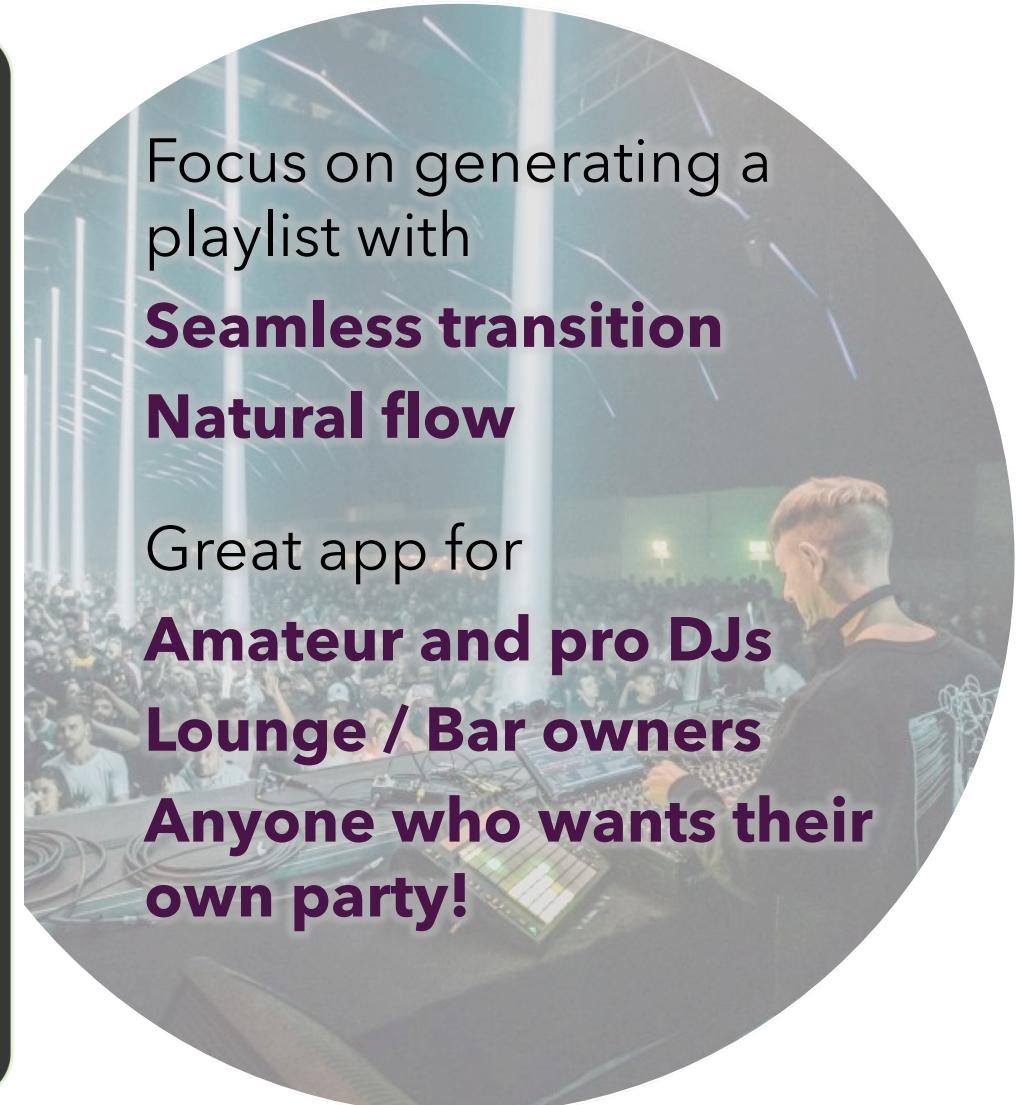
- ▶ Deep Learning
Transition and flow
- ▶ Content-based filtering
BPM, Key, Energy Level



Introducing DJ Koze!

Artists: Mathame Title: Nothing Around Us  Search

	Cover	Artist	Title	BPM	Key	
1		Mathame	Nothing Around US	123	10m	
2		Adriatique	Studies in Dance Theory	121	5m	
3		Marlon Hoffstadt	Der Merowinger	122	6m	
4		Raphael Mader	Fuego (Original Mix)	124.5	1m	
5		Shiny Objects	Virtual Light (Original Mix)	126	8m	

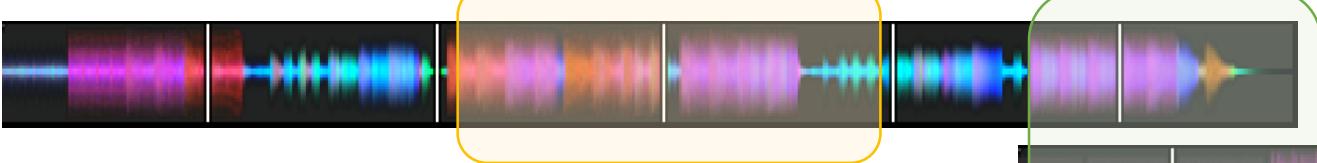


How Mixing Works

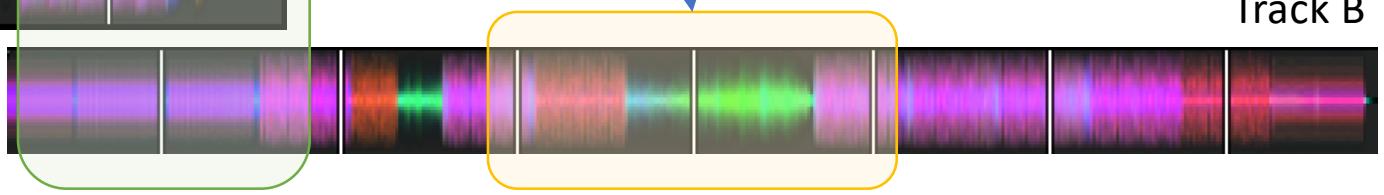
Texture of Music

- ▶ Frequency
- ▶ Amplitude
- ▶ Energy Level

Track A



Track B

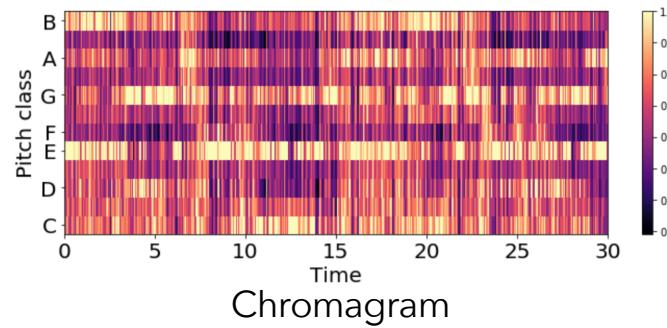


Harmonic Mixing

- ▶ BPM
- ▶ Key
- ▶ Mode

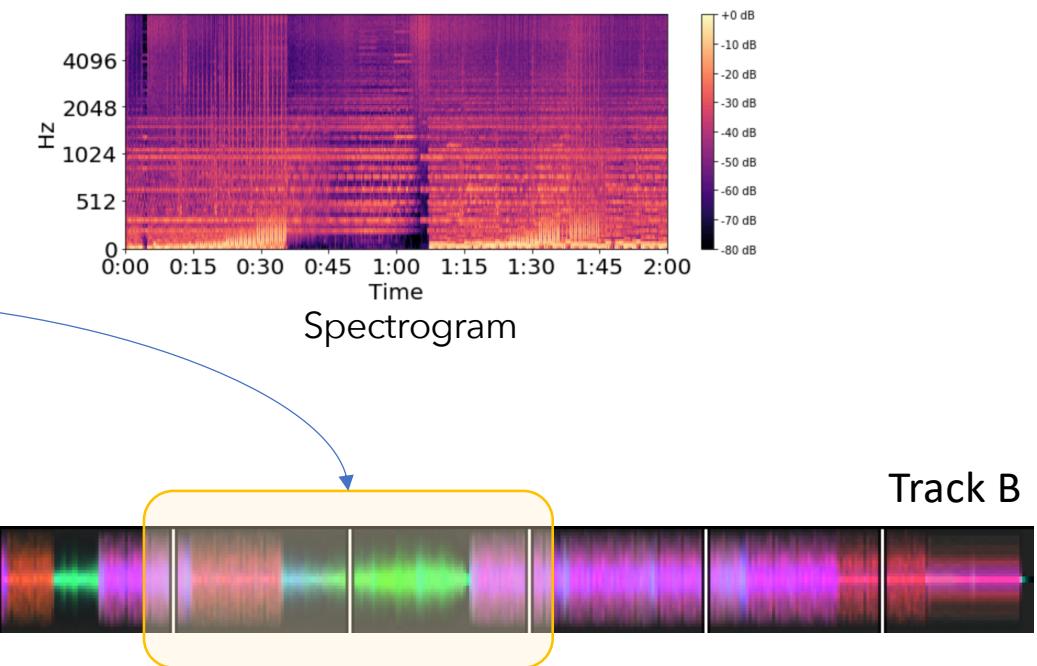
How Mixing Works

Track A



Texture of Music

- ▶ Frequency
- ▶ Amplitude
- ▶ Energy Level



Harmonic Mixing

- ▶ BPM
- ▶ Key
- ▶ Mode

Data Processing & Modeling

~ 2000 mp3 files
downloaded
(all electronic music)



Audio features obtained
through Spotify API



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Muzbase

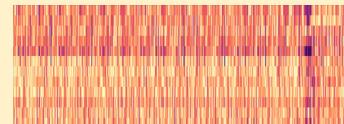
beatport

Audio features obtained
through Spotify API

 **Spotify**
WEB API

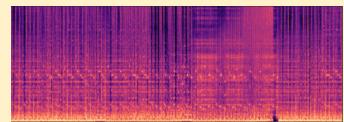
Convert mp3 to **images representation**

Intro / Ending:



Chromagram

Middle:



Spectrogram

LibROSA

Data Processing & Modeling



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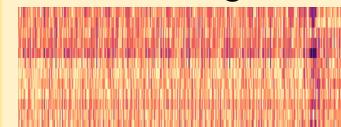
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 **Spotify®**
WEB API

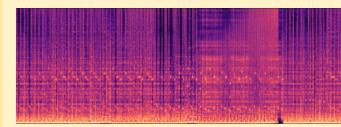
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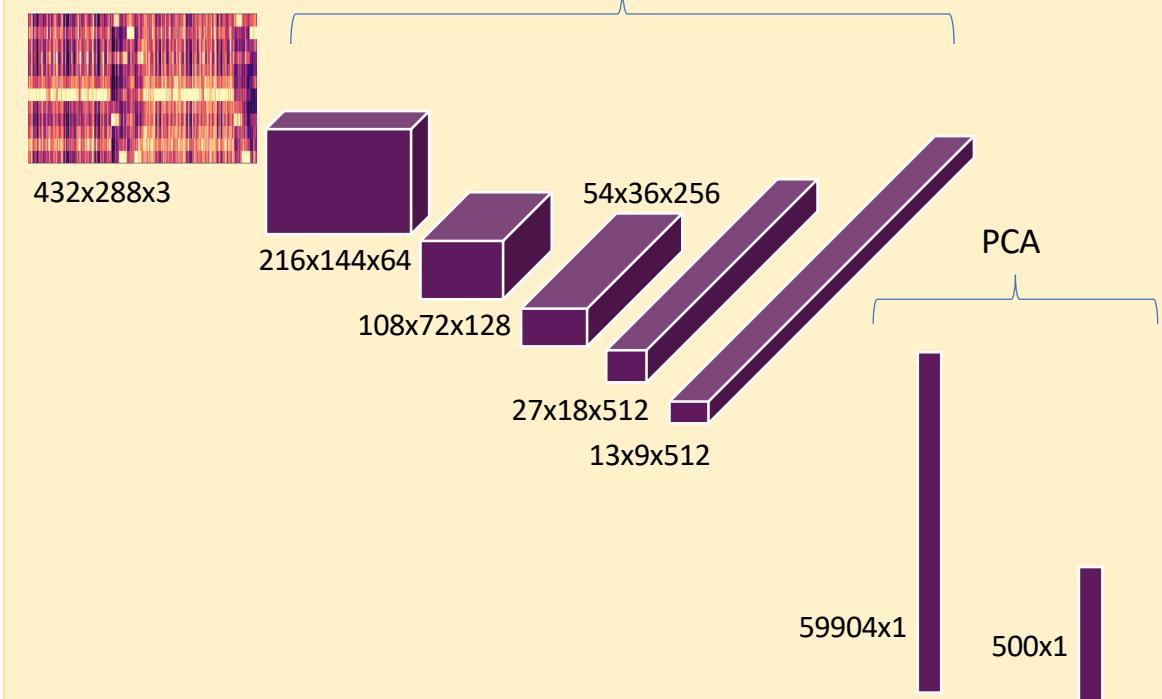


Spectrogram

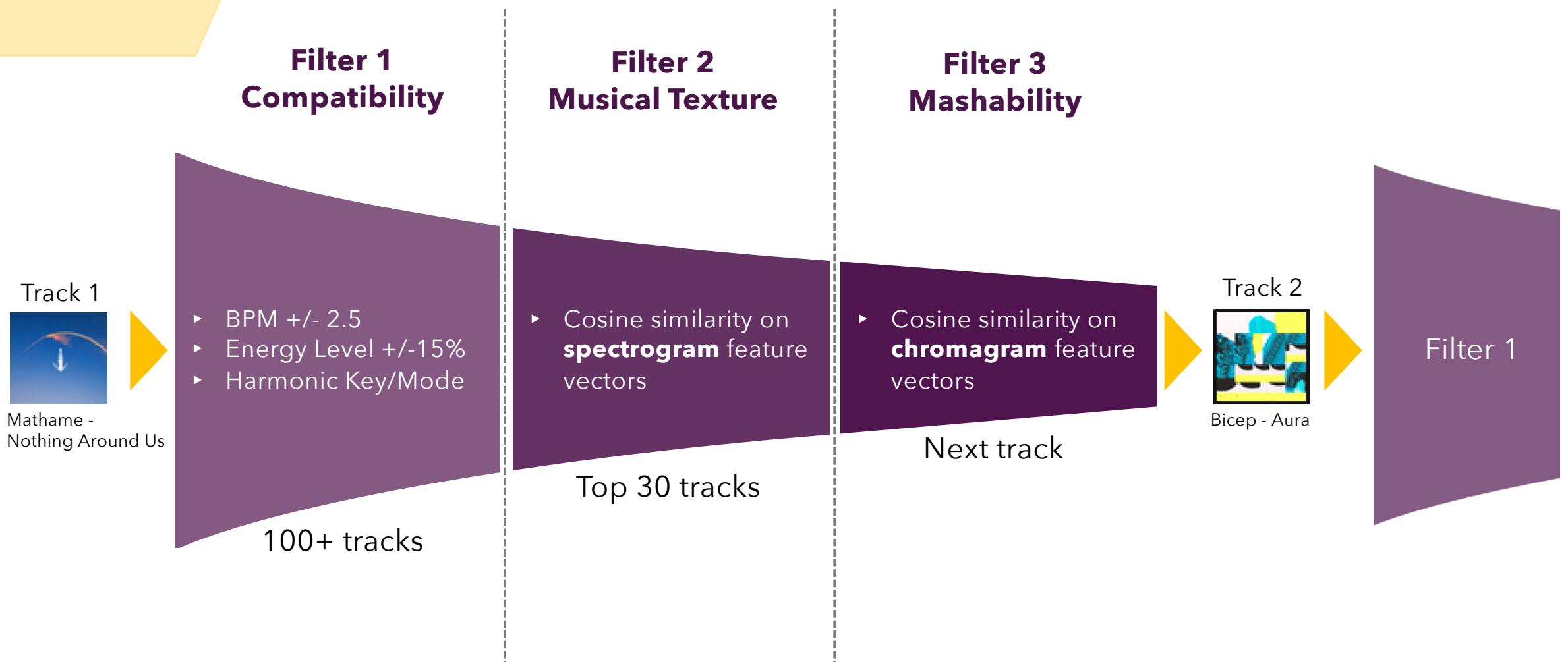
LibROSA

Feature Extraction:
Using **Convolutional Neural Net** and **PCA**

VGG16 Transfer Learning



Recommendation Logic



Model Results

Artists:		Mathame	Title:		Nothing Around Us	Search
Cover	Artist	Title		BPM	Key	
1	Mathame	Nothing Around US	Nothing Around US	125	10m	
2	Bicep		Aura	123	1d	
3	Petar Dundov		Pyroelectric	123	1d	
4	DJ Zombi		Breakfast Of Champion	123	8d	
5	Pitto, Noir		You (Noir Remix)	122.5	1d	

Melodic Techno or
Progressive
recommended

BPM and Key
in
mixable range

How Effective is DJ Koze?



Thank you!

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