Music and AI

Understanding the Role of Machine Learning for Music in Media

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Motivation: Why are we doing this?

- Machine learning in music

- Societal motivation, liking for music

Topic: What are we doing?

Take music from a music database with a variety of genres

Use AI and machine learning to create genre labels

Streamline and better conceptualize audio picking process

MUSIC AUDIO

FEATURE EXTRACTION

GENRE LABELING

ACHIEVE GOALS

Features such as tempo, instrumentalness, speech ability, etc.

Improve process of selecting music from databases

Create genre labels using machine learning

Considerations: What factors did we think about?

```
1   // json response
2
3   {
4
5       "danceability": 0.735,
6       "energy": 0.578,
7       "key": 5,
8       "loudness": -11.84,
9       "mode": 0,
10      "speechiness": 0.0461,
11      "acousticness": 0.514,
12      "instrumentalness": 0.0902,
13      "liveness": 0.159,
14      "valence": 0.624,
15      "tempo": 98.002,
16      "type": "audio_features",
17      "id": "06AKEBrKUckW0KREUWRnvT",
18      "uri": "spotify:track:06AKEBrKUckW0KREU
19      "track_href": "https://api.spotify.com/
20  ckW0KREUWRnvT",
21
22
```
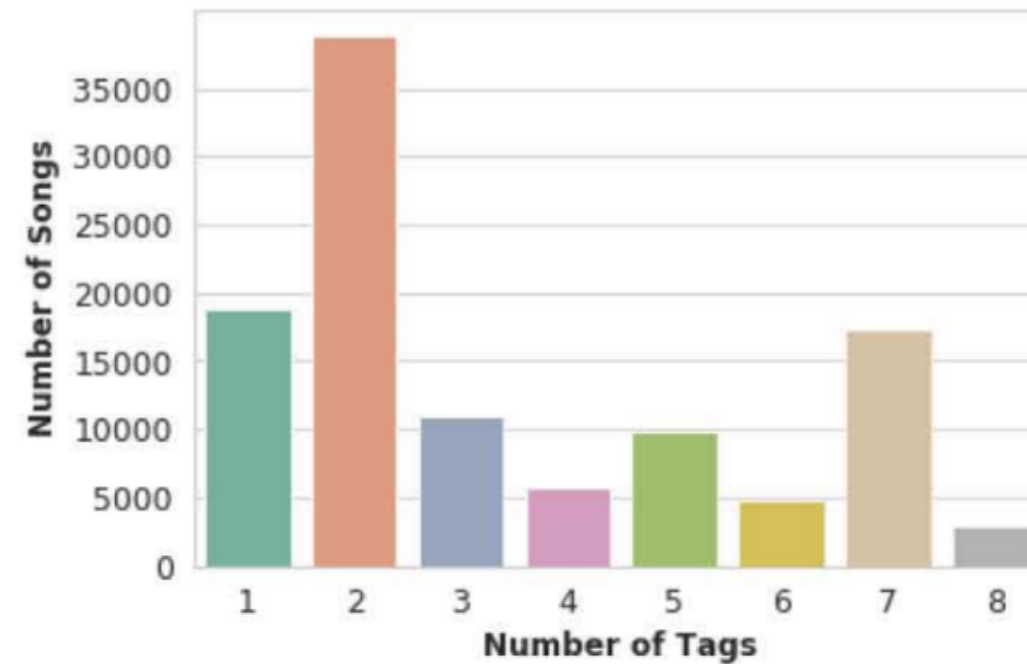
- Danceability
- Energy
- Loudness
- Speechiness
- Instrumentalness
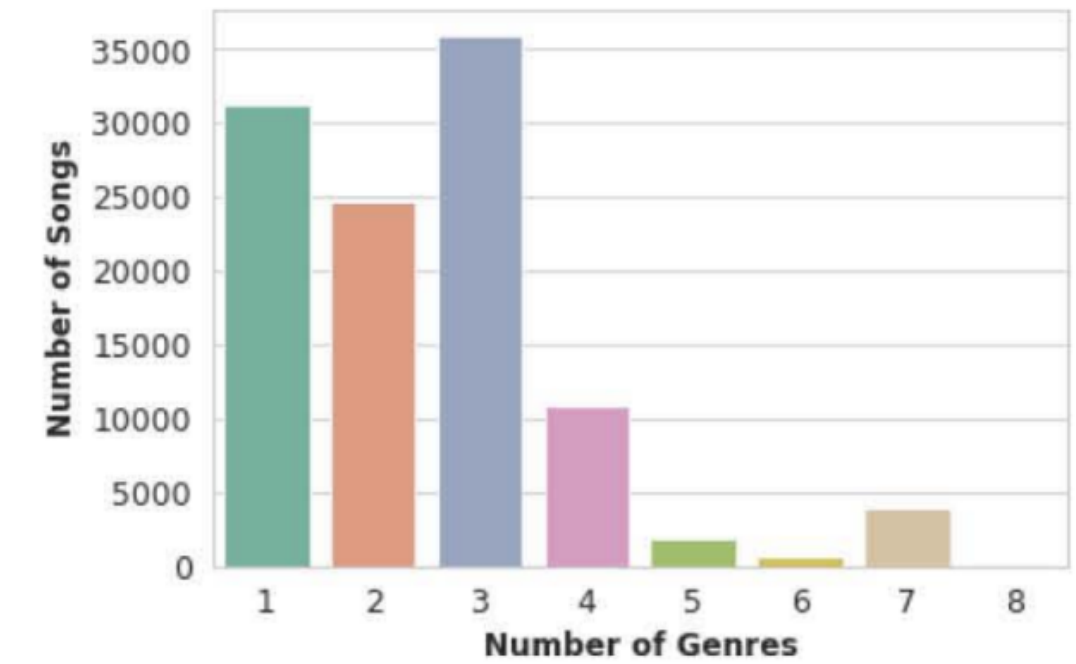- Liveness
- Valence
- Tempo....

Details: What's our domain and sample?
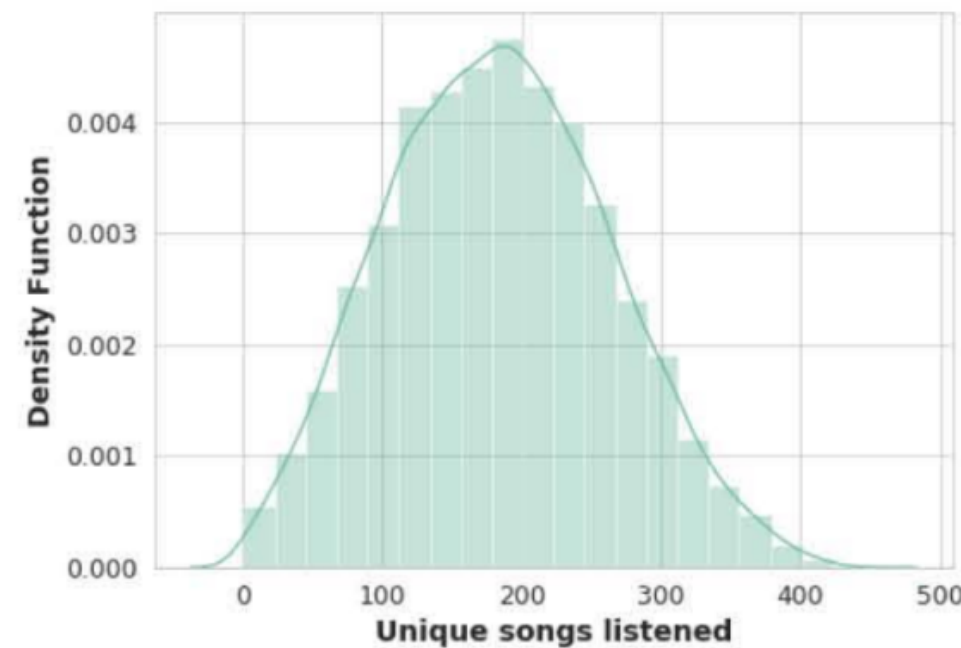
(a) Amount of unique songs a user listened to.

(b) Distribution of tags per song.

(c) Distribution of genre tags per song.

- Music4All Dataset

- 15,602 users

- 109,269 songs

Findings. What's our one big finding?

- Motivated by the USC-SAIL submission for Media-eval challenge, primarily exploring their work.

- Loss function matters

- Ensemble CNN architecture

Music4All: A New Music Database and Its Applications

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Abstract—One of the goals of the music information retrieval (MIR) community is to research new methods and create new systems that can efficiently and effectively retrieve and recommend songs from large databases of music content. Despite the volume of research in the area, there is a lack of music databases to support these works, i.e. databases that comply with some quite desirable requirements for the development of researches, such as: a huge amount of music pieces, the audio signal availability and a great diversity of audio attributes. In order to contribute to the MIR community, we present Music4All, a new music database which contains metadata, tags, genre information, 30-seconds audio clips, lyrics, and so on. Additionally, we also exemplify some MIR tasks that may benefit from our database and compare it with other databases proposed in the literature. To request the Music4All database, send an e-mail to contact4music4all@gmail.com.
Keywords—Music Information Retrieval (MIR), Music Database, MIR Applications

traditional MIR tasks. The Music4All database, including 30-seconds clips, lyrics and other attributes, is available under request[4].

The remaining of this paper is organized as follows. In Section II we describe the process that generated the Music4All database. Three MIR tasks that can be explored based on Music4All are presented in Section III. In Section IV we compare our database with other music databases in the literature. Finally, conclusions and future work are presented in Section V.

II. THE DATABASE

Music4all was designed to be a useful database in different domains of research. Therefore, it needed to gather different types of information related to the songs. To achieve this purpose, the development process was split into two phases, called the user phase and the music phase. In the user phase we gather information about the listening history of users, and in the song phase we collected data about the songs (i.e. audio, lyrics, etc).

I. INTRODUCTION

Music goes beyond what we know as an element for fun or

Lessons Learnt

1. Possible real-world applications to represent diverse populations
   a. 'Music4All' (music4all.us) provides a simple interface for Alzheimer's patients to find music recommendations
2. The importance of loss functions for model training to quantify performance
   a. Accuracy is key for model training and loss indicates the how far an output is from the desired target

Thank you!

Hope you enjoyed our presentation :)