

## Pitch 4

My goal is to create a music recommendation system using AI. I will begin by gathering a large set of data of music-related information. This could include data on songs, artists, user preferences, playlists, and user interactions (e.g., likes, skips, ratings) from streaming platforms or music databases. Platform APIs like Spotify, Last.fm, or user-contributed data sets like the Million Song Dataset can be valuable sources. I will clean up the data by handling missing values, removing duplicates, and ensuring data consistency. Convert data into a format suitable for machine learning, such as numerical representations or embeddings for songs and users. I will then extract relevant features from the data to describe songs and users. Features could include genres, tempo, artist popularity, user listening history, and more. I will then build a recommendation model using several techniques, including collaborative filtering, content-based filtering, matrix factorization, and deep learning. I will then train my recommendation model/algorithm using historical user interactions with songs. I then will split my data into training, validation, and test sets to evaluate model performance. I will then measure and evaluate the performance using metrics like Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), or precision-recall metrics. Once it starts performing well, implement it into a platform. I will then create a user-friendly interface. I can have a collection system to store feedback and have improvements as an option. Lastly, make sure the user's data is handled securely and privacy concerns are addressed.

### Article 1

- Machine Learning Algorithms - A Review
- Mahesh, B. (2020). Machine learning algorithms review. International Journal of Science and Research (IJSR).[Internet], 9(1), 381-386.
- Anon.Retrieved September 20, 2023 from [https://www.researchgate.net/profile/Batta-Mahesh/publication/344717762\\_Machine\\_Learning\\_Algorithms\\_-\\_A\\_Review/links/5f8b2365299bf1b53e2d243a/Machine-Learning-Algorithms-A-Review.pdf](https://www.researchgate.net/profile/Batta-Mahesh/publication/344717762_Machine_Learning_Algorithms_-_A_Review/links/5f8b2365299bf1b53e2d243a/Machine-Learning-Algorithms-A-Review.pdf)
- Shows the breakdown of what ML is and how it works
  - May be useful for later knowledge
- Explains the differences between the different types of machine learning
  - Supervised & unsupervised
- Shows the in-depth research of ML and the science behind it

The article is about the field of machine learning (ML). It discusses machine learning, which is the study of algorithms and statistical models computer systems use to perform tasks without explicit programming. The article mentions how learning algorithms are applied in various daily

applications, such as web search engines like Google, and highlights the importance of these algorithms in ranking web pages. It also touches on the diverse applications of machine learning, including data mining, image processing, and predictive analytics. The primary advantage of machine learning is its ability to automate tasks once the algorithm learns from data. The article suggests that it provides a brief review and discusses the future prospects of machine learning algorithms in various applications.

## Article 2

- AI-based Music Recommendation System using Deep Learning Algorithms
- R. Anand1, et al. 2021. IOPscience. (June 2021). Retrieved September 20, 2023 from <https://iopscience.iop.org/article/10.1088/1755-1315/785/1/012013>
- Dives deep into the use of different algorithms
- Explains the different formulas that will be used
- CNN & RNN are the leading operators
  - This is until AI is able to categorize audio signals carefully
- Proves accuracy

The ultimate goal of a personalized music recommendation system is to reflect individual preferences accurately. Achieving this requires adjustments to cater to various users' needs and finding improved deep-learning models. In the current era of abundant digital music, navigating this vast library can be overwhelming, leading to data exhaustion. An automated music recommendation system that scans users' libraries and suggests relevant songs could alleviate this issue. Providers can offer tailored recommendations by analyzing the characteristics of previously heard music. The study aims to build a recommendation framework based on audio signal feature similarity, utilizing Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN). Overall, the objective is to enhance the representation of private music preferences by continually refining the recommendation model.

## Article 3

- Can Music Influence Language and Cognition?
- Sylvain Moreno. 2009. Retrieved September 20, 2023 from <https://www.tandfonline.com/doi/pdf/10.1080/07494460903404410>
- Explains the science behind music and what it does to humans
- Music is special and impacts the soul and mind

This article dives deep into the effects music has on mood. It looks at the process of social influence in music, considering the role of music in personal and social identity, and small group studies of the effects of music on mood. Music has an impact on the body's performance and can really impact one's actions for the better or worse. Discusses how music and language are very similar. Shows how music can shape and train the processing of language.

#### Article 4

- Mood Based Music Recommendation System
- Mahadik, Ankita, et al. 2021. Mood based music recommendation system - researchgate. (2021). Retrieved September 26, 2023 from [https://www.researchgate.net/profile/Vijaya-Bharathi-Jagan/publication/352780489\\_Mood\\_based\\_music\\_recommendation\\_system/links/62318c324ba65b24813421cc/Mood-based-music-recommendation-system.pdf](https://www.researchgate.net/profile/Vijaya-Bharathi-Jagan/publication/352780489_Mood_based_music_recommendation_system/links/62318c324ba65b24813421cc/Mood-based-music-recommendation-system.pdf)
- Detection of user's emotions based on song choice

A mood-based music recommendation system is designed to suggest music to users based on their current emotional state or mood. These systems leverage various techniques, including machine learning and data analysis, to match songs or playlists with a user's mood preferences. Examples of mood-based music recommendation systems include Spotify's personalized playlists like "Discover Weekly" and "Release Radar," which use machine learning algorithms to recommend music based on user preferences, listening history, and current mood indicators.

#### Article 5

- Diversity by Design in Music Recommender Systems
- [Porcaro et al. 2021] Lorenzo Porcaro, Carlos Castillo, and Emilia Gómez. 2021. Diversity by Design in Music Recommender Systems. Ubiquity Press. [https://repositori.upf.edu/bitstream/handle/10230/48901/porcaro\\_tismir\\_divers.pdf?sequence=1&isAllowed=y](https://repositori.upf.edu/bitstream/handle/10230/48901/porcaro_tismir_divers.pdf?sequence=1&isAllowed=y)
- Refers to the concept of designing music recommendation systems with a focus on providing diverse and varied music recommendations to users

Diversity by Design in Music Recommender Systems suggests a research focus or approach that aims to improve music recommendation systems by ensuring that they are designed to provide users with a diverse selection of music. This approach recognizes the importance of not limiting users to a narrow set of musical choices and, instead, enriching their musical exploration by introducing them to a broader range of options. It can enhance user satisfaction and help users discover new music they might love.

## Article 6

- Current Challenges and Visions in Music Recommender Systems Research
- Markus Schedl, Hamed Zamani, Ching-Wei Chen, Yashar Deldjoo, and Mehdi Elahi. 2018. Current challenges and visions in music recommender systems research. ACM Computing Surveys, 51(4), Article 86 (April 2018), 27 pages.<https://link.springer.com/article/10.1007/s13735-018-0154-2>

Challenges include addressing the "cold start" problem for new users, ensuring diverse recommendations while satisfying user preferences, and handling sparse data effectively. Researchers aim to provide consistent recommendations across various platforms, incorporate contextual information, and define appropriate evaluation metrics. Future visions encompass highly personalized recommendations, integration of advanced AI and machine learning techniques, user-centric designs, interdisciplinary collaboration, ethical considerations for fairness and privacy, and enhancing serendipitous music discovery to keep users engaged.