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EMOTION BASED MUSIC RECOMMENDATION SYSTEM BY USING DIFFERENT ML APPROACH

BAGDE SARIKA VIDYASAGAR[1], ASST.PROF. V. KARWANDE[2]

ME Student, Department of Computer Science & Engineering, EESGOI , India[1]
HOD, Assistant Professor, Department of Computer Science and Engineering, EESGOI,India. [2]

Abstract: ***The human face plays a vital role in the determination of a behavior and emotion in an individual organ. It takes a lot of time to sort a music collection out manually and create an appropriate playlist based on unique emotional properties. Different algorithms have been suggested and implemented for automatic playlist building. However, existing approaches are slow to calculate, are less accurate and may even require extra equipment such as EEG or sensors. The suggested technique, based on extraction of face expression, creates a playlist, which reduces the time and labor necessary to manually render the process. The system will also have song-lyric recommendations as well as system-to-person queries like how did you go? This enables the suggested system to minimize the computing time necessary to create the results and the total cost of the intended system, thereby increasing the overall accuracy of the systems. A built-in camera captures facial expressions. Calculates the accuracy of systems for the recognition of emotions for real-time photographs. For overcrowded concerns to be addressed and user particular data to be recommended, incorporate a collaborative filter, content-based recommendation, using sentiment-based music, sharing workload between high end servers and mobile low-end devices.***

Keywords*: k-Nearest Neighbors (KNN); Convolution Neural Networks (CNN); JavaScript Object Notation (JSON); Gaussian Mixture Model (GMM).*

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I INTRODUCTION

The science field is as large as the cosmos. There are fresh advancements every day; if not large or groundbreaking, they are beneficial and contribute to a brighter tomorrow. Two huge science and engineering sectors, Sound and Graphics, not only captivate, but also draw learners to examine them in detail. Several of these breakthroughs have since brought us to current period in which it is now feasible to think of different concepts that could not be implemented a few decades ago and more. Now that taking a photo and listening to music is only one aspect of everyday life, any improvements are constantly appreciated in the work of such technologies so that user experience is improved in turn. The degree of software sophistication has likewise improved with technological developments. The objective is keep things easy, too. It is a difficulty to design complex apps. Music Player based on Facial Expression is a complex, dynamic and unique mobile application (Android) to play in a different way as a music player. The programme works differently from the usual software when it scans and categorises the audio files on the device and Audio Features in line with predetermined parameters, in order to build a collection of mood-based playlists. The input from the application in real time is classed as Facial expression recognition in order to generate a mood that is used to choose the appropriate playlist from the previous set.

Sentimental analysis, due to the expansion of the Internet industry, has become a leading field in natural language processing (NLP). It may be utilised to mine implicit emotions in text effectively that may help enterprises or organisations to decide better, and a rising data growth certainly offers fresh potential and obstacles in analysing feelings. At the same time, transfer learning has grown as a new machine learning approach to solve different domain problems by applying current knowledge and generating cutting edge forecasting results. Many scholars employ transfer learning in the field of sentiment analysis. This study summarises current research findings and focusses on transfer learning techniques and applications in sentiment analysis with a view to the future trend of development in sentiment analysis. [1]

II LITERATURE SURVEY

In this research, in cloud computing, Sentiment analysis has become one of the most prominent fields of natural language processing, thanks to the rapid growth of the Internet sector (NLP). It may be used to efficiently mine the implicit emotion in text, which can assist businesses or organisations in making better decisions, and the increasing growth of data

surely brings additional opportunities and difficulties to sentiment analysis. Simultaneously, transfer learning has evolved as a novel machine learning methodology that applies current knowledge to address various domain issues and generates cutting-edge prediction outcomes. In the realm of sentiment analysis, many researchers use transfer learning. This review highlights recent sentiment analysis research findings and focuses on the methods and applications of transfer learning in sentiment analysis, with an eye toward the sentiment analysis' future development trend [1].

In this research, deep learning's groundbreaking advancements in speech recognition, picture analysis, and natural language processing have gotten a lot of attention in recent years. Deep learning technology has been applied to recommender systems and has become a hotspot study field in artificial intelligence. Deep learning, in contrast to typical recommendation models, can successfully capture non-linear and non-trivial user-item connections and allows for the codification of more complicated abstractions as data representations in higher levels. We present a detailed assessment of the research on deep learning-based recommender systems in this paper. We begin by covering the fundamental terminologies and principles of recommender systems and deep learning technologies. Second, we go through the present state of deep learning-based recommender systems research. Finally, we discuss potential future research areas for deep learning-based recommender systems [2].

In this research, new doors of opportunity have opened for employing data analytics to acquire meaningful insights from unstructured data as a result of the development of IoT technology and the widespread adoration and acceptance of social media tools and applications. In the age of big data, the use of opinion mining and sentiment analysis (OMSA) has shown to be a beneficial tool for categorising public opinion into different sentiments and assessing public mood. Furthermore, many OMSA approaches have been created through time in diverse data sets and used to diverse experimental scenarios. In this regard, this study gives a full systematic literature review with the goal of discussing both the technical (techniques and kinds) and non-technical (application areas) aspects of OMSA. Furthermore, this study discussed both technical and non-technical aspects of OMSA, such as problems in the development of its technique and non-technical issues related to its implementation. These problems are proposed as a research topic for the future [3].

In this research, the research provides basic information on machine learning and recommender systems, as well as case studies. The topic of machine learning algorithms, which are used in such systems, was discussed more generally. The focus of the article was on filtering algorithms based on the proximity of individuals or objects, as well as content. The similarities, shortcomings, and advantages of various algorithms are described, as well as measures for evaluating the algorithm and the calculation of the sample value of the evaluation prediction. The description of the utilised databases from the Movie Lens portal kicks off the planning phase of the project. Following that, the technology and practical implementation of the above-mentioned algorithms are presented. The next section offers an analysis of the findings and conclusions based on computer simulations to determine how the algorithms function. A summary, performance evaluation of recommendation systems, and lessons gained from the project, as well as a proposal for further study on the subject of such systems, are included at the conclusion of the work [4].

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In this research, an unanticipated surge in the usage of social web sites has necessitated the development of highly sturdy and trustworthy systems, as well as a variety of machinery forms, in order to evaluate such vast amounts of data and their warehousing that are acquired from diverse businesses. We are constantly curious to learn what others think, feel, and perceive about numerous elements of living and non-living creatures. Opinion mining is required to comprehend and analyse distinct behavioural traits as well as

personality differences. It is a compilation of all extracted information from all available resources and conceivable instances, which might include concealed emotions, paragraphs, text, urban lingo, and numerous unidentified representations. It represents numerous things in a wide range of applications, not just related themes like sensex, politics, money, and other important words. Almost all of the sites have made it possible to exhibit and offer diverse media and their perspectives on current events. They can discuss a variety of philosophical topics, as well as a variety of other topics. They can reflect a variety of viewpoints on numerous aspects of life, which has become increasingly important in our daily lives as we evaluate the exponential growth trend. This study article offers a sentimental study of numerous smart phone opinions, putting them into three categories: positive, negative, and neutral behaviour. This is mostly accomplished by analysing the many postings made by a diverse group of users based on their areas of interest when categorising smart phones. A sentence made up of many words represents various user attitudes as well as the numerous experiences and impacts the product has had on them. This study uses a structural modelling technique and a Bayesian Interface system to determine the polarity of an opinion, after which it is classified as positive or negative [6].

In this research, in recent years, recommendation algorithms have become increasingly popular in commercial platforms to provide users with personalised recommendations. One of the most common algorithms used in recommendation systems is collaborative filtering. These methods are simple and efficient; nevertheless, the sparsity of the data and the method's scalability limit their performance, making it difficult to increase the quality of the recommendation results further. As a result, a two-part model integrating a collaborative filtering recommendation algorithm with deep learning technology is proposed. First, the model employs a feature representation approach based on a quadric polynomial regression model, which improves on the usual matrix factorization process in terms of obtaining latent features. The deep neural network model, which is the second portion of the proposed model and is used to predict rating scores, uses these latent properties as input data. Finally, by comparing our model to various recommendation algorithms on three public datasets, we can see that our model can effectively increase recommendation performance.[8].

In this research, the World Wide Web has become a large source of user-generated content and opinionated data in recent years. Users may easily communicate their thoughts and feelings by using social networking sites such as Twitter, Facebook, and others. Millions of people share their views in their everyday interactions on social media sites such as Twitter, Facebook, and others, which can represent their thoughts and thoughts about a specific topic. These ever-increasing subjective data are unquestionably a wealth of information for any type of decision-making process. Sentiment Analysis is a field that has arisen to automate the analysis of such data. Its goal is to find opinionated data on the Internet and classify it according to its polarity, or whether it has a good or bad connotation. Sentiment Analysis is a text-based analysis problem, but it has various problems that make it more complex than typical text-based analysis. This clearly implies that an attempt to solve these challenges is required, and it has opened up various avenues for future research into negations, concealed feelings identification, slangs, and polysemy. However, the increasing volume of data necessitates the use of automated data analysis tools.A complete survey of different methodologies utilised in Sentiment Analysis is conducted in this study to determine the degree of work [11].

In this research, the goal of sentiment analysis (SA) is to categorise people's responses to a piece of text into distinct categories, such as positive and negative. Another challenge is to determine if a text is subjective, in the sense that it expresses the writer's opinions, or objective, in the sense that it expresses facts. These activities were carried out at several levels of analysis, spanning from document to sentence and phrase level. Aspect extraction, which arose from aspect-based sentiment analysis at the phrase level, is another challenge. SA is in charge of all of these responsibilities. In recent years, a significant range of methodologies, approaches, and innovations for the problem of SA in various jobs at various levels have been proposed. Without focusing on a specific level or job, the goal of this study is to categorise SA approaches in general. Also, to go over the main research issues raised in recent works in this topic. The most common techniques employed were machine learning-based techniques such as supervised learning, unsupervised learning, and semi-supervised learning approaches, Lexicon-based techniques, and hybrid techniques. Recent techniques are still unable to work well in different domains; sentiment classification based on insufficient labelled data remains a difficult problem; SA research in languages other than English is lacking; and existing techniques are still unable to deal with complex sentences that require more than sentiment words and simple parsing [12].

In this research, several Internet firms have been experimenting with sentiment analysis in recent years to recommend content based on human emotions conveyed through informal language posted on social media. The sentiment analysis measures, on the other hand, merely classify a sentence as positive, neutral, or negative in intensity, and do not detect sentiment fluctuations based on the user's profile. This study introduces a music recommendation system based on a sentiment intensity metric called enhanced Sentiment Metric (eSM), which combines a lexicon-based sentiment metric with a user-profile-based adjustment factor. Subjective tests conducted in a laboratory environment are used to discover this adjustment factor. The correction factor is generated and utilised to adjust the final sentiment intensity based on the experimental outcomes. The users' attitudes are derived from sentences posted on social media, and the music recommendation system is carried out on mobile devices using a low-complexity framework that suggests songs based on the current user's sentiment intensity. In addition, the framework was created with usability ergonomics in mind. The suggested framework's performance is evaluated with remote users utilising the crowdsourcing method, with a user satisfaction rating of 91 percent, exceeding a randomly assigned song suggestion with a user satisfaction rating of 65 percent. In addition, the article shows low perceived impacts on the analysis of energy consumption, network, and latency in accordance with the recommendation system's processing and memory perception, demonstrating benefits for the consumer electronic world [13].

III. SYSTEMS ARCHITECTURE

The system model architecture suggested includes the design The user will give input into the text or the speech format mostly in speech format, which converts the speech into a text, which sends text in json for analysis to a server, and which calculates emotions, and searches for keywords to return millions of songs that filters the songs again under the co-operation filter. First step the emotions and keyword are taken into account and on the basis of the most probably extracted data, which other users listened to, is able to reduce the cold start problem since we already have all data, which are sorted by the most popular genres, the type of music, music year, length, singer and feelings.

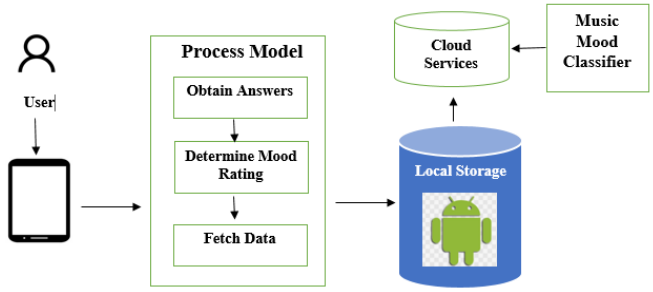

Figure No 3.1: System Architecture

IV EXPERIMENTAL RESULTS

Facial Micro Expression Model CNN The number of courses is 500 and the rate of learning is 0.0001. The CNN facial micro expression model has obtained 62.1 percent recognition rate in data set, following multiple parameters adjustment tests. Looking at the literature in this connection, we found that most of the accuracy is approximately 60%. Following figure shows the visualization process after network training.

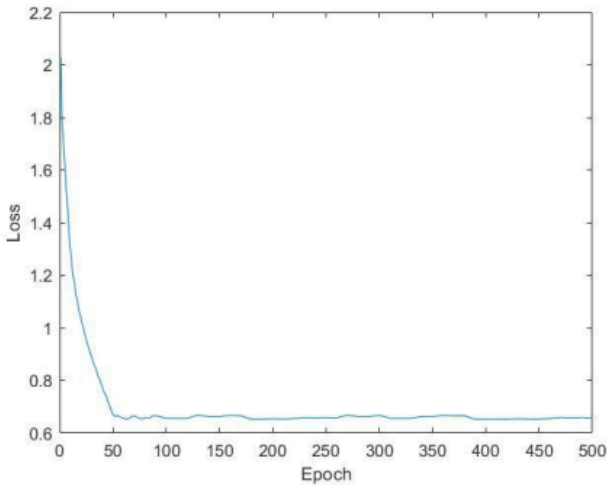

Figure No 4.1: Loss Function Curve.

V CONCLUSION

The hybrid strategy of mixing cooperation with content recommendations enhances the suggestion and, more all, eliminates the problem of cold start, as we already have similar user data on the server. User-based recommendations boost user interest and boost the effectiveness of a recombination algorithm. We also employ user emotions since we immediately link emotions. feelings.

Mobile devices now have at least 1GB of RAM and a faster CPU as they progress. we utilise json in data transfer and java or dart have integrated functions or libraries in which json is handled so that hundreds of results may be calculated in seconds and a list is shown. Php was taken from the server since it is well known and comes on most servers before installation. It has no libraries like numpy in Python, but it is a quite stable language with a big supporting library and is ideally suited for extraction of lexical emotions. As we leave, we will use MySQL to save the categorised data collected from raw data, which will simplify keyword and emotional searches. The latter KNN is used for categorising and cooperation.

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