



Music Recommendation System Using Chatbot.

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ABSTRACT

— The proposed research work develops a personalised system, where the person's present day emotion is analysed with the assist of the chatbot. The chatbot identifies the person's sentiment by means of asking a few popular questions. Based totally on the enter provided by way of the user, present day emotion or mood is analysed by using the chatbot and it'll generate the playlist. The proposed recommendation device utilises the APIs for the playlist era and advice.

The text-primarily based recommendation of song might be of significant use in this technological era, as humans may want to discover comfort from stress through being attentive to soothing tracks adjusted to their mood. On this assignment, we are building a chatbot that recommends music based totally at the consumer's textual content tone.chatbot that recommends tune in keeping with the tone of the text expressed by means of the user, we can become aware of the temper.as soon as the mood is diagnosed, the application will play songs within the form of an internet page primarily based on the person's desire in addition to his modern mood. In our proposed system, the primary purpose is to reliably decide a user's temper based on their textual content tone with a software that may be set up at the user's laptop. In the modern world, human pc interplay (HCI) performs a crucial function, and the most famous idea in HCI is the reputation of emotion from the text.

Keywords—INTRODUCTION,PRODUCT-ARCHITECTURE, TONE ANALYZER,MUSIC CLASSIFICATION BASED ON MOOD,ACOUSTIC ANALYSIS,EXPERIMENT,FUTURE/CURRENT USE,IMPORTANCE,BACKGROUND,LITERATURE SURVEY,METHODOLOGY,EQUATIONS,PLANNING ,TOOLS AND TECHNOLOGY,CONCLUSION.

I INTRODUCTION

Communication is the factor which we do in our daily life however having communication and studying the feeling through the music is an exclusive stage.To experience higher

and more enjoyment, people discover music critical of their lives. Why go over the music streaming which isn't customised to search the song that the person is feeling when the user gets a recommendation while based on the conversation the user has with chatbot. In an average conversation, approximately 93% of communication is decided with the aid of emotion being expressed. People are able to detect emotions,which is fantastically vital for success.

Chatbots help enterprise groups to scale their interactions with users. you may embed it in any important chat app, such as facebook Messenger, Slack, Telegram, and textual content.Messages. Chatbots enhance the person's enjoyment by facilitating interactions among users and services. Are you bored with all the weird chat bots out there which might be designed typically for enterprise purposes? As a part of this project, we will build a chatbot carrier to which you may communicate. This wouldn't be an enterprise-driven communicate. we might really have interaction casually. Moreover, the chatbot could also suggest songs based on the tone of the person's voice.To enforce the tune advice characteristic, Last.fmAPI could be used, a service very much like Spotify API. Moreover, IBM Tone Analyzer API will be used for the tone/emotion evaluation of the communication. API integration is very critical today because the famous chatbots do plenty more than simply have information-pushed communication; in addition they offer greater person-friendly capabilities. In addition to offering a wide array of open-source libraries for building chatbots, python also offers a big selection of open-supply libraries for constructing chatbots, along with scikit-analyse and TensorFlow. For small records sets and less difficult analyses, Python's libraries are more sensible.

Normal, every and absolutely everyone undergoes a lot of issues and the reliever of all the stress that is encountered is music. If it's so, the essential part of listening to the song needs to be in a facilitated manner, that is a player capable of playing the track in accordance to the man or woman's temper. The paper proposes such a player and as a result named Emotion based totally music participant. spotting the human emotions is considered to be a worldwide consistency however depict variability a number of the humans on the idea in their capabilities. The different methods being the category of emotions which might be existing are depicted as information-based, statistical and hybrid strategies. However, there are several difficulties

II ARCHITECTURE

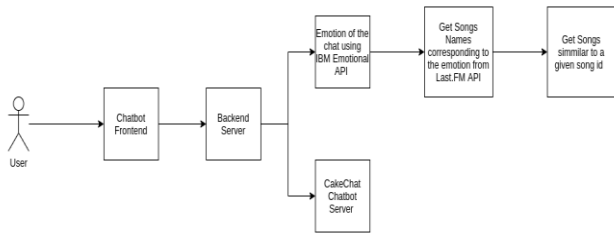


Figure 1
Product Architecture of Music Recommendation system using chatbot.

The figure totally confirmed us how this project might be seem like .essentially , frontend is gonna show us how the ui seem like however every time person talk with chatbot it will ultimately displays on the frontend.And the server aspect there are specially api’s would be operating to discover the emotion of the textual content of person through the usage of IBM Emotional API and after the detection of the emotion it’ll suggest the music via last.FM API .

conversation is initiated by means of the person
The IBM Emotional API is used to research the conversation's emotional content material
The Cakechat Chatbot will respond in your conversation by utilising the last.fm songs API, the app retrieves the top songs primarily based on the Emotion it perceives

- After being attentive to a song for some time, a similar track may be recommended to the consumer the use of the last.fm API.

TONE ANALYZER

An evaluation tool b Language, emotional, and social tones are the three forms of conversation tones.

There are five distinct emotional tones: anger, disgust, fear, pleasure, and sadness. There are three exclusive linguistic tones: analytical, confident, and tentative. There are five predominant social traits (big five personality traits): openness, conscientiousness, extraversion, agreeableness, and emotional variety.

What sort of learning has taken place?

the use of system studying, a version created to expect the tone of recent texts primarily based on conversations. system gaining knowledge of the use of the help Vector system (SVM). around 30% of samples are related to more than one tone, so they decided no longer to apply multi-class category, but as a substitute multi-label classification. The model becomes educated independently for every tone using the one-vs-relaxation paradigm. the very last tones have been decided by way of figuring out the ones expected with at least a zero.five possibility.

Please be aware that shorter sentences cannot be analysed. A single sentence may additionally comprise up to 128KB of text (about 10 sentences). customer tweets / fb posts on enterprise pages might be a very good use case.

MUSIC CLASSIFICATION BASED ON MOOD

Classifying music may be difficult because listeners' emotional reactions can range for the equal tune. Normally, songs are categorised by using the general genre of the artist instead of the feeling evoked through the tune. In spite of the demanding situations of categorising tunes using engineering strategies, it could assist to limit those discrepancies among listeners. The potential to pick out the mood of a bit automatically might be extremely beneficial for sorting massive collections of digital tunes, inclusive of those determined on iTunes and Spotify. Online radio offerings like Pandora can also use mood to decide similar songs, instead of figuring them out by comparable artists. it's far feasible to match songs to precise mood categories primarily based on quantifiable musical components like rhythm, harmony, and timbre while the tune is broken down into its quantifiable elements.

There are a number of present techniques of dividing moods in song according to Robert Thayer's conventional version

emotions. The model includes dividing songs primarily based on their levels of strength and pressure, from happy to sad and calm to energetic, respectively (Bhat et al 359). the usage of Thayer's version he created eight categories that covered the extremes of the lines as well as the factors in which the lines may also pass each other (e.g. happy-energetic or sad-calm). figure 1 illustrates the model.

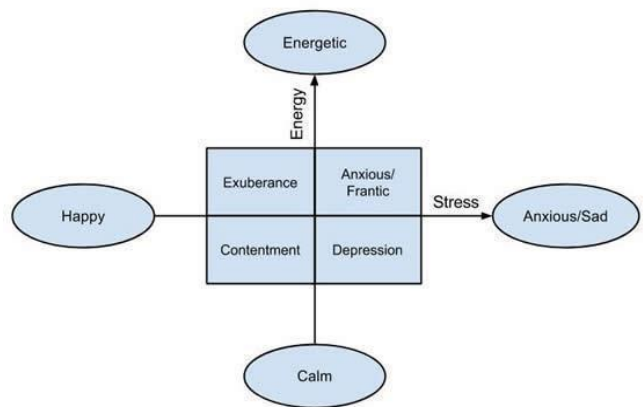


Figure 2: The mood model of Thayer. This model was derived from Bhar (2014).

A quicker pace corresponds to a song that has high strength, even as a slower tempo corresponds with a song with decreased strength. Songs which are loud may be related to anger, at the same time as softer songs suggest tenderness, sadness, or fear (Bhat et al 360). Harmonics create tonal components of a piece that tell the mood of a bit by way of their timbre. A higher pitch means happiness, carefree mood, and mild mood, even as a lower pitch may severe, mournful mood. According to researchers at the BNM Institute of generation in Bangalore, India, timbre stimulates the human strength levels no matter rhythm or harmonic saturation. a song with simple harmonic profiles has a tendency to have a darker timbre and has a tendency to assuage humans. Songs with a variety of intensity represent anger, at the same time as smooth songs specific tenderness, sadness, and fear (Bhat et al 360). feelings” (Bhat et al 360). in addition they developed a correlation table of intensity, timbre, pitch, and rhythm which will discover diverse moods,

Table. 1

In step with the equal researchers, moods are categorised consistent with musical components. table 1 indicates a correlation table for intensity, timbre, pitch, and rhythm. This version is derived from Bihar (2014).

Mood	Intensity	Timbre	Pitch	Rhythm
Happy	Medium	Medium	Very High	Very High
Exuberant	High	Medium	High	High
Energetic	Very High	Medium	Medium	High
Frantic	High	Very High	Low	Very High
Anxious/Sad	Medium	Very Low	Very Low	Low
Depression	Low	Low	Low	Low
Calm	Very Low	Very Low	Medium	Very Low
Contentment	Low	Low	High	Low

From very low to very excessive, the tune components for all 8 of Thayer's mood classifications are shown in desk 1. In general, emotions of happiness, exuberance, and strength have better timbres, pitches, and rhythms than moods of calmness, contentment, and despair. The cause of this newsletter is to give an explanation for how specific strategies of virtual signal processing may be used to discover the rhythm, pitch, intensity, and timbre of musical portions the use of DSP.

III EXPERIMENTS

A number of experiments are offered in this phase to analyse the consequences of the category of songs primarily based on numerous capabilities of the audio. An engineering institution from the BNM Institute of era in Bangalore, India, will present its paintings. There were differences in intensity, timbre, pitch, and rhythm in an expansion of songs across moods in keeping with an algorithm. To make the class selection, threshold amounts for every audio function have been compared (Bhar et al.). In table 2, the common amount of each audio characteristic in precise moods is proven.

The mean values for audio features across moods. Adapted from Bhar (2014). intensity and timbre are provided as normalised values - they have to honestly be considered as relative to each other. In Hz, the pitch is expressed because of the variety of cycles in keeping with 2nd, and in BPM, the rhythm is expressed because of the quantity of beats per

minute. These consequences are very consistent with the expectations mentioned within the previous section on acoustical evaluation. Someone in an excessive-power mood, inclusive of glad or frantic, has nearly double the rhythm in beats in keeping with minute than someone in a low-strength mood like calm or contentment. Contentment or happiness, which are lower stress moods, generally tend to have a better common pitch than sad or depressed moods. table 3 under suggests the outcomes of the category manner based totally on these values.

Results of an experiment to identify songs using audio features. This model was derived from Bhar (2014). energy, calmness, and happiness had been the most efficiently diagnosed moods. All of those are above 90% accuracy, which may be very superb. A mood classification algorithm should be very accurate to be commercially possible. If a huge quantity of mistakes had been corrected after identification, the cost of the algorithm could be faded, given that it is designed to lessen the quantity of time the listener will spend being attentive to man or woman pieces. portions incorrectly diagnosed can also have been placed in nearby moods - as an instance, a peaceful song can also had been wrongly diagnosed as contentment. professionals may additionally discover it hard to differentiate among those regions of the mood scales..

Representation of Application:

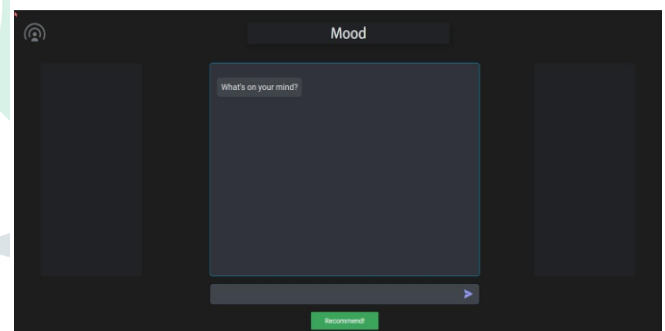


Fig.1 Screen after opening the App

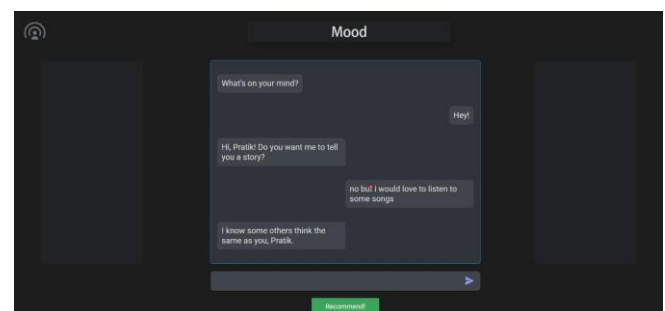


Fig.2 Initiation Via User Input

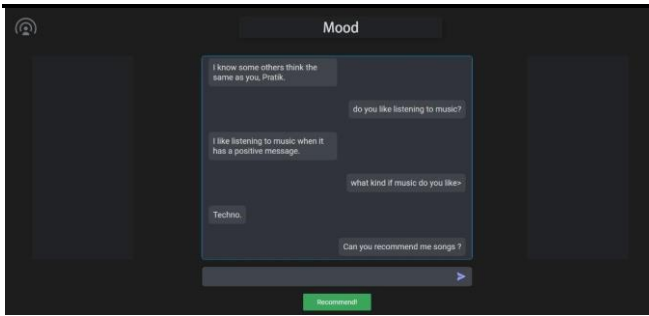


Fig.3 Conversation Between Chatbot and User.

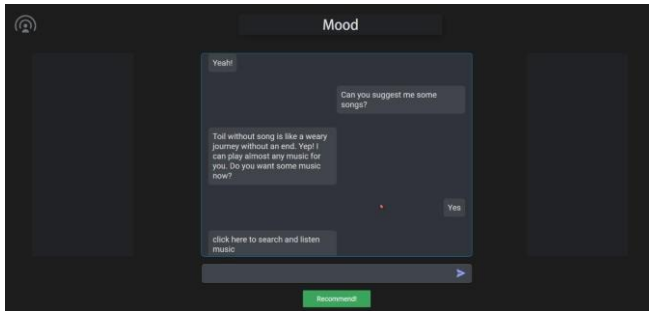


Fig.4 Analysing Tone /Mood Based On the Conversation.

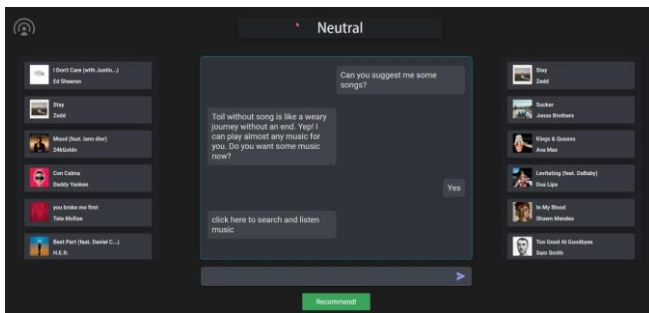


Fig.5 Recommendation Of Song Based On Tone / Mood.

state that "the result is a miles greater customised radio experience" (Pandora.com).

1. IMPORTANCE

It's far essential to filter out, prioritise and effectively supply applicable information on the net, in which there may be an amazing quantity of selections, to relieve the problem of data overload, which has created a task for plenty of net users. Users can benefit from recommender systems by offering them with personalised content material and offerings, looking through a huge amount of dynamically generated data. Similarly, social networks these days are extensively used to facilitate social interaction and to proportion facts. The contributions by using users offer perception into their behaviour, experience, evaluations, and pursuits. Due to the fact that persona impacts many factors of human behaviour, the way we suppose, and the way we experience, it makes experience to decorate the contemporary collaborative filtering advice engine by way of such as personality-based qualities. It has been tested that facts in a consumer's social media account displays the character's actual character, no longer their Social networking internet site facebook, with its huge consumer base, offers a great platform for users to analyse their personal personalities. one of the most popular character models has been recognized because the "large five version" called the "5 element version" (FFM).1.1.

In the beginning: Having open thoughts means appreciating art, emotion, journey, uncommon thoughts, imagination, interest, and range. they are also more likely to preserve unconventional beliefs. They have a tendency to be extra innovative and touchy. Some of the samples used by human beings with this tea are active. usually those human beings are enthusiastic and movement-orientated. They are enormously seen in groups, like to speak and are assertive. a few sample objects used by person with this trends are:

- I love to be the lifestyles of the birthday celebration
- I really like the existence of the party.
- I experience being the centre of attention.
- The human beings right here make me feel comfy.

Agreeableness: This trait displays character variations in fashionable concern for social harmony. People who are agreeable cost social harmony. usually, they may be considerate, kind, beneficent, trusting and trustworthy, helpful, and willing to compromise with others. in addition they have a pleasing outlook on life. some pattern objects used by man or woman with this trends are:

- I have a heart of gold.
- People are of interest to me.
- I placed others earlier than myself.

Future/Current Use

The genre of a music is presently determined by the way the artist when submitting an album or single to a song search engine, which includes iTunes or Spotify. relying on a consumer's musical choices, iTunes may propose albums or artists. The software may additionally display a submit under an album that asserts, "customers who appreciated this additionally preferred X.". Such a method works properly while figuring out comparable artists or albums on the premise of a store software, however no longer for songs. consider an artist who has both upbeat and ballad songs - following purchase of a ballad via the primary artist, one has to suggest a ballad by way of any other comparable artist.

There may be an era that can identify the mood of a song, however it hasn't been implemented in business tune stores. internet radio applications like Pandora, however, have begun to apply greater analytical strategies whilst creating playlists. As part of the song Genome task, released through Tim Westergren in 2000, Pandora analyses music structure to discover similar songs. As of may also 2006, its library includes over 400,000 songs through more than 20,000 modern-day artists (Joyce). as much as 450 track characteristics are analysed by means of musical professionals for every music in the library. Pandora is better capable of understanding and reply to a person's tastes after running with the track Genome undertaking, and that they

Neuroticism is the tendency to enjoy terrible feelings, which includes anger, anxiety, or melancholy.

- I'm easily indignant.
- Stress makes me without difficulty agitated.
- I'm effortlessly upset.

2. ALGORITHMS

SVD (Singular value Decomposition) algorithm: SVD may also be a matrix factorization technique that is commonly used to decrease the amount of feature of a dataset by reducing the matrix from N space to k space wherein $k < N$. For the point of the guidance framework be that as it can, we're just fascinated approximately through the matrix factorization component preserving identical dimensional. The matrix factorization is finished at the user-item scores matrix built. Each object is often represented with a q vector. Similarly, every client is often represented by using a p vector such that the inner product of those 2 vectors is the predicted rating. locate p and q such it minimises the following:

determine: - Nearest neighborhood model: Nearest neighborhood model involves collecting data from several customers at that factor making forecasts in step with the similarity measures between customers and between objects. This is probably grouped into consumer-based and object primarily based fashions. In object-based totally model, it is expected that songs that are often listened collectively by way of sure customers will in general be indistinguishable and are bound to be listened together in future additionally with the aid of some other purchaser. in accordance to purchaser primarily based similarity model, clients who've similar listening histories, i.e., have listened to comparable songs within the beyond will in widespread have comparative pursuits and may most probable listen to comparable songs in future as nicely.

3. ADVANTAGES -

Chat-bots have 24/7 Availability: Chat-bots are available to remedy client troubles 24/7 whether it's miles day or night time! They don't need to sleep in spite of everything! This is a lot extra hard to attain the usage of human purchaser provider as it might require rotating teams that would be more complicated to manage as well. Which means that chat-bots can answer customer queries whenever clients have queries which assist in increasing consumer loyalty. If companies don't cope with consumer issues as soon as possible, then the customers can also transfer to another company that provides better customer service. Chat-bots cause an increase in sales: customers can get instant assistance and answers for their troubles through the use of chat-bots while the usage of dealers takes an extended time. whilst clients get such proper service, chances are high that they may be more loyal to the organisation so that you can pressure up income. businesses can also use chat-bots to

marketplace their modern products directly to their customers. while customers get guidelines for a product at the same time as chatting to a talk-bot, it's far lots more personal than a mail or a random advert and they may be greater probable to shop for the product. So chat-bots can increase income in this way as well.

Chat-bots offer lengthy-term financial savings: organisations that have human customer service teams need to pay a huge sum of money as salaries to their employees. massive then their expenditure could be similarly big as well! right here, a chat-bot can lessen this expenditure so that the organisation has lengthy-time period monetary financial savings. Even as it's miles proper that first of all, a enterprise has to make investments quite a lot of money and time in developing a talk-bot, after some time the chat-bot may be capable of solving all the primary consumer queries that might have taken a whole lot of time for people. further to that, the chat-bot can provide immediate replies which saves time. And time is cash in commercial enterprise!

4. DISADVANTAGES-

Chat-bots can best take care of fundamental questions: Chatbots are nonetheless a simple synthetic. Intelligence technology and so they can most effective answer the fundamental questions of customers and offer fashionable data that is already available to them. They cannot resolve complicated queries or solutions out of script questions and corporations want to have human customer support personnel that could manipulate these for them. However, that is changing with time and presently, more and more superior chat-bots are getting into the marketplace. Chat-bots are difficult to create: Chat-bots are created using natural Language Processing which is extraordinarily popular for customer service applications. Natural Language Processing is part of machine-gaining knowledge which can be used to interact with the users in textual form and solve their queries. but, this calls for complex programming and isn't clean for businesses. This will become particularly tough if organisations should create chat-bots from scratch and that is why many online platforms help companies to build and manage chat-bots without difficulty. Chat-bots require steady protection: companies can not simply create a talk-bot after which they depart it hoping that it'll successfully solve client inquiries all the time! The company merchandise changes with time and extra advanced natural Language Processing abilities are also evolved with time. All of these changes need to be programmed into the chat-bot so that it has the most up to date facts. in addition to that, chat-bots additionally want to be periodically analysed so that the maximum common questions that customers can be recognized and then their answers up to date for future clients.

5. LITERATURE SURVEY

Few of the key skills emphasised by using manner of the papers which have been surveyed are:

Nikhil et al. [1] use algorithms and technology which consist of Haar cascade, Canny area, Blob detection for the method

of emotion detection. The gadget captures images of the person and in step with that mood gets detected. Inputs like face and emotions are taken from the image, and the device additionally affords a communication container to provide responses. The proposed gadget inside the paper gives a new technique for building a pc application for chat bot using textual content and gestures. The device is capable of making a conversation via the chatting application. The machine will deliver some links, internet pages or information counting on the reaction from the client. The device detects smiles and pressure. While a smile is detected via the manner of the tool, jokes pop-up in the states can be confirmed on the display, and at the same time as pressure is detected, inspirational rates pop-up in the states of america may be validated at the display screen. In addition, glad songs are performed when a smile is detected. And similarly, inspirational songs are played while stress is detected.

Ai Thanh Ho et al. in their paper [2], introduce an Emotion-based totally film Recommender gadget (E-MRS) that is supposed to treatment the trouble that the conventional system of consumer profile does no longer reflect on consideration on how crucial customers feelings are and the manner they have an impact on customers alternatives, which the recommender systems are not able to apprehend and seize the constantly changing alternatives of consumer. In keeping with the paper, the goal of EMRS is to give the customers a list of recommendations which are custom designed using a mixture of collaborative filtering and content material-based total techniques. right here the customers feelings in addition to his options are taken under consideration when supplying a advice, additionally different similar user reviews are taken into consideration. The layout of the proposed device, its implementation at the side of its assessment procedure is likewise discussed. In order to relate emotions to films, the users have to solve a questionnaire about what movies or which classes of films they appreciated to watch according to each emotion. Moreover, the system captures personal emotions with the aid of asking them to use 3 colours to beautify their avatar.

Inside the paper [3], Manish Dixit et al. proposed a technique for Harris nook point. That's considered as the maximum critical characteristic that is progressed by means of the usage of the Bezier curve. It produces a low size feature which changed into used in photograph popularity. They design a model for function extraction from face photographs to solve the problem of sentiment reputation in a minimal time period. To reap execution in a minimal time period they execute the manner efficiently and logically through using a stepped forward and strong combination of straightforwardness and cleverness of locating functions. On this design they stumble on the Harris nook factors on diverse elements of the face and on the basis of those factors the Bezier curve.

Fatima Zahra Salmam et al. in [4] has applied a Sentimental analysis from facial expressions. This analysis is finished with the aid of the usage of three steps like detection of face, extraction of functions and expressions class. There are

arguments on which they focused: First consciousness has become on to lay out a geometrical based technique for extraction of features. This geometric primarily based method is used to calculate a distance of face that allows you to offer facial features. Secondly, the point of interest became to put out an automatic supervised machine studying approach called a decision tree. They made use of precise databases particularly JAFFE and COHEN to which the choice tree set of policies become implemented. They enhance the accuracy and use a new mixture of parameters which specifically cognize on eyebrows, eyes, mouth and the nose of the face. They completed facial recognition accuracy charges of just about 89% and 90% for JAFFE and COHEN databases respectively.

Jae Sik Lee et al. [5] have used the concept of context reasoning wherein the context records are applied to understand the user's scenario. They suggest a track advice device that incorporates the capacity of context reasoning in this paper. Their proposed device carries modules such as goal Module, temper Module and recommendation Module each of which provide a completely unique capability to the system and play a crucial role for the systems performance as an entire. Context reasoning is performed by using the aim Module with the assistance of environmental context information and concludes whether or not the person is interested in being attentive to song or not. subsequent, the sort of track this is deemed to be maximum appropriate to the users context is decided by means of the temper Module. Ultimately, the song is suggested to the consumer by means of the advice Module.

Renuka R. Londhe et al. in [6] have studied the concept of spotting facial expressions by using thinking of the various properties which can be associated with a people face. whenever there's a alternate within the facial functions, modifications can be noticed within the curvatures on the face as well as features of the face together with nostril, lips, eyebrows and mouth region. And as a end result, there may be modifications within the intensity of the corresponding pixels of the snap shots. Those features are then labelled into six expressions which consist of anger, disgust, worry, satisfied, sad and marvel with the help of an artificial neural community. The Scaled Conjugate Gradient again-propagation algorithm is used to teach and take a look at the 2-layered feed beforehand neural network. They received a 92.2 % recognition price. Here, they have made use of the JAFFE database which includes seven expressions for assessment via the laptop.

Dolly Reney et al. of their paper [7] cope with the significance of face and emotion identification within the place of security and the way it facilitates giving answers to the different challenges confronted. Database plays a chief position at the same time as comparing the facial attributes and sound Mel frequency components, with reference to whichever face and emotion identification device. The database is created for which facial characteristics are computed and people are then stored within the database. diverse algorithms are used in order to analyse the face and emotion with the assistance of the

aforementioned database. The implementation of the technique of recognizing the folks face and the emotion being expressed by using manners makes use of a powerful method for the creation of a database comprising facial expressions and emotion. They have used the Viola-Jones set of regulations for the face identity device and the face and emotion identity is evaluated via the KNN classifier.

Shan C et al. inside the paper [8], the facial presentation is empirically evaluated steadily with the statistical nearby abilities, local Binary patterns (LBP), that permits you to understand the expressions depicted with the aid of the face which can be character-impartial. numerous device getting to know algorithms have been used on one among a kind databases in order that they are probably deeply analysed. Thorough evaluation depicted that LBP features had been critical for figuring out the facial features efficiently and efficiently. next, they developed Boosted- LBP which extracts the most discriminant LBP features, and even as help Vector device classifiers are used alongside the Boosted-LBP capabilities, they finished the popularity overall performance. The overall performance of LBP functions is strong and sturdy throughout a treasured scope of low resolutions of face pix and convey favourable outcomes in compact low-choice video sequences which may be recorded in an actual-world environment, all of which become located via their experiments.

METHODOLOGY

There is a simple problem statement: recommend music to users from a large collection of songs. A number of live online music recommender systems exist, each using its own methodology to suggest music. For example, Last.fm uses a method in which user activity and similarity scores based on tags, artists, and tracks are considered.

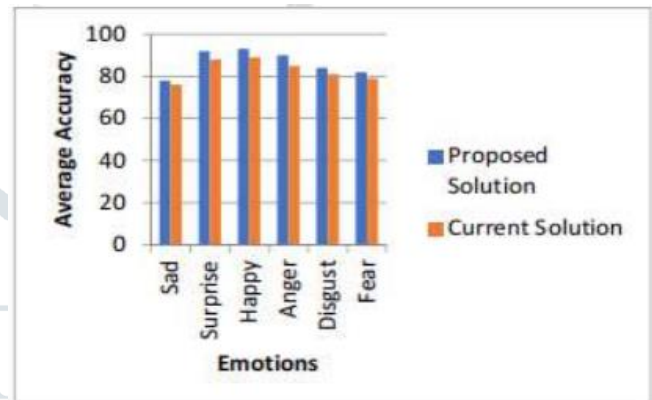
CONCLUSION

While a track is broken down into quantifiable factors like rhythm, harmony, and timbre, it could be matched to particular mood categories in keeping with predicted information. despite the fact that this category system is not ideal, it could be used for a selection of technical purposes, along with identifying comparable songs for online radio or automating huge catalogues of music, as in iTunes. both the accuracy of the results and the velocity with which type algorithms may be applied will decide the application of the application.

From the above survey we've made it may be concluded that there can be a high-quality increase inside the layout of chat-bots so one can cause a big effect on human lives. Further to this a contrast has been made between numerous

chatbots so far advanced which had been represented inside the form of different algorithms.

We additionally collected all the requirements needed for building our machine and studied the general procedure worried in chatbot's operation. Ultimately we summarised the deployment necessities of our gadget. On the belief observe our 'Chatbot Track Recommendation Gadget' is used to facilitate the use by bodily challenged people to automate and provide them better song participants revel in. The software solves the fundamental wishes of music listeners without troubling them as present packages do.



Average accuracy of various emotions

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