Medical Insights into the Artistic Presentation of Integrating Public Environment and Health into Music Emotion

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Abstract. A large amount of music is stored in the network music database. Music emotion recognition is significant in video soundtracks and music information retrieval, and related research is also increasing. However, the existing music emotion recognition models and feature extraction technologies have encountered bottlenecks. Traditional classification models need help extracting deep music features, have poor accuracy, poor generalization ability for different types of music features, and need help adapting to other data sets. The culture behind it influences each music presentation's form, content, style, etc. With the improvement of the environmental quality of public spaces, public environmental signs, as a unique visual sign language, provide people with essential visual information, which is called a "compass" and is an indispensable part of life. With the development of the times, the dizzying public environmental signs have also caused a particular impact on the ecological environment. The design of urban general environmental signs under ecological design has become a challenging problem, which has constantly caused designers to think deeply about how to make signs more artistic, better recognized, and integrated into signs more artistic, better recognized, and integrated into the surrounding environment. The functional theory of music health has been included in various theories of the origin of music. This article attempts to start with the mechanism of action of singing therapy, an essential form of music health, on the human body. Intervention characteristics of singing training on physical and mental health. Analyze the mechanism and principle of singing on the human body through the two levels of physiology and psychology, understand how singing training shows the advantages of its impact on physical and mental health in music health, and explore and discover how to use singing training methods to improve music literacy and thinking ability, language skills, interpersonal communication, etc. Achieve the mastery of essential knowledge and skills of music in singing art and music activities can also promote the overall development of body and mind. With the innovation and popularization of computer application technology and the high growth of Internet technology in China in recent years, digital multimedia technology has

appeared in all aspects of daily life, changing and affecting people's living habits and aesthetic tastes. The experimental results show that optimizing the CNN-LSTM audio emotion model is a high degree of fit for different angles of art presentation in the public environment and in terms of health. The calculation model is accelerated by 3%, and the accuracy of the fitting degree is relatively high.

1   INTRODUCTION

At home and abroad, breakthroughs have been made in emotion recognition technology based on different emotional spaces. This paper conducts in-depth Research and comparison of the methods proposed in the past. Music emotion recognition based on two emotion spaces (continuous and discrete emotion) is performed by combining multimodal music emotion features with deep learning [27]. It is well known that music and emotion are inseparable. The emotion of music has gradually begun to attract the attention of the scientific community in recent years.

The harmonious coexistence of man and nature is an eternal topic. With the extensive development of ecological civilization construction, while the traditional urban model is developing, it is also moving towards an "ecological city," which not only reflects the cultural characteristics of the city but also reflects the cultural quality of the city [24] Therefore, we also need a design concept that adapts to the environment to achieve a balance. The standardization and universality of public environmental signs have become a trend, and the general environmental signs under the ecological concept include humanistic care, regional culture, green environmental protection, and other factors. It is an indispensable element in the urban space environment, and it embodies the spirit of the times and the development of civilization. It permeates people's living environment and contributes to improving the functions of the city, facilitating people's behavior, and improving the quality of the urban environment; it will affect the landscape environment of the space where it is located and then affect the visual image of the entire city. There are several ways of presenting music emotion, especially music: video recording, documentary filming, and musical creation. From the perspective of communication, it is the best way to show it. With varying degrees of loss, From Benjamin's "halo" theory, the musical emotion presented after mechanical reproduction has lost the "halo" of the art itself, that is, "authenticity," "cult value," and "aesthetic sense of distance." Benjamin never denied mechanical copying, and we still do not deny it today. Automatic copying is the best way to protect musical emotions or other types of art, but we appreciate these copied works of art. At the same time, the "halo" of the artwork itself also dissipates. Today, the improvement in living standards, the doting of family members, the variety of entertainment methods, and the development of the information age have led to everyone's strong personality, poor sense of cooperation, and psychological fragility[14].

Scientific singing and breathing training can exercise lung function and increase lung capacity. Singing is also a process of releasing negative emotions to be vented and resolved. At the same time, due to the need to memorize music when singing works, it will involve different cultural background knowledge and various singing languages, etc. subtly, you can gain a lot of things beyond the understanding of textbooks, broaden your horizons, and stimulate potential in all aspects[25]. The harmony composed of the pure human voice can significantly influence people's emotions, which is closely related to the origin of singing. Singing originated in Western churches. Communicating with God requires a different timbre than other singing methods. This may be why people can touch their hearts when they appreciate singing, which can affect people's cognitive concepts and improve their personality. In the context of the new era, along with the rapid

development of technological innovation, the art of music has ushered in a new period of vigorous growth. The application of emerging technologies has driven the development of the diversification of art forms of music [28]. Especially in recent years, the Excessive pursuit of new and peculiar technologies has led to the emergence of many creative styles that need more logic, artistry, and aesthetics in music and art creation. Focusing on artistic creation, it is essential to re-examine and balance the application of technology and art in music art creation. The law of development, combined with the corresponding case analysis of the role played by the development of digital media technology in the creation of music and art, at the same time, rational analysis, scientific summary, and finally, a complete and macro summary of both technology and technology in music and art creation, supported by technology Art, the creative idea of art packaging technology.

In summary, combined with the public environment and health, based on recognizing mainstream music emotions and using virtual reality technology to present music emotions, more audiences can understand music emotions from a new perspective. The practical value of this paper is for music emotions. The latest presentation method provides a feasible technical solution [1].

2   RELATED WORKS

Emotions are human feelings and emotional responses to objective things, regarded as psychological activities generated under specific stimulation conditions [17]. Music is often called "emotional language"; it can regulate mood, release stress, enrich our lives, and most importantly, people's demand for music today is more for emotional resonance. How to accurately select the desired music in the era of rapid development of big data and the sharp increase in the number of digital music has formed a complex problem, and how to locate the music emotion accurately is also a challenge because human emotion has a subjectivity, different people have different emotions for the same concert, so it is not possible to classify music according to the evaluation of minority groups [23] In recent years, music emotion recognition has gradually become a popular trend. Problems related to the accuracy of music emotion recognition to provide support and help for music search. As an indispensable element in the composition of urban space, urban public environmental facilities are, of course, essential to meet the needs of the public for use and aesthetics, but how to respond to the space environment, guide people's activities, and remind people to identify urban regional attributes, it seems that has a deeper meaning [16]

Starting from the action mechanism of music, combined with the characteristics of physical and mental development, the specific impact of singing training on physical and mental health development was analyzed using the singing art form intervention method. Taking the effect of singing on the human body as the starting point, Research on the application of singing in physical and mental health [11] How music therapists should use the functionality of music to play their due value in music activities for their physical and mental health, interpersonal communication, etc. The specific Research on singing training will provide a reference for developing future psychological interventions and music activities [20]. The development of therapy is a cause that requires the joint promotion and attention of society, schools, families, and other aspects. The harmony of society, the cultivation of students' comprehensive quality, and physical and mental health have specific influences. First, society needs to pay more attention to physical and mental health issues and not lead children to go astray because of neglect. Secondly, school music education carries far more than teaching music knowledge and professional skills in music classes; it also undertakes the development of physical and mental health. Character development and cultivating "three views" are significant responsibilities.

Like film and television art, it is an art category emphasizing the expression of time and space.[6] In television, the composition and movement of shots constitute the transformation of time and space. Through the montage of the lens, the real-time can be compressed or omitted. Through the recording and movement of the lens, the actual space can be reproduced realistically so that people

can obtain an immersive space experience [2]. In traditional music and art presentation, time and the change of space are completed through the transformation of the scene. Subject to the limitations of environmental factors and on-site performance in traditional music and art performance, it is often challenging to complete the performance without interfering with its smooth progress under significant time and space changes and spans. With the development and application of digital media art, combining sizeable digital LED screens and digital images, the difficulty and consumption of setting scenes have significantly been shortened quickly. The four seasons of music scenes can be easily realized, and the music scene can be easily changed. First, using art to show the "aesthetic interest" in daily life requires the artist to discover the "beauty" of life and refine and process it. Finding the "beauty" in life is not difficult, but transforming objective beauty into the expression of personal taste requires the artist's unique aesthetic ability. Through his aesthetic cultivation, the artist extracts the "beauty" of everyday life scenes such as scenery, family life, indoor corners, etc., and then processes and refines them in his mind so that the objective "beauty" is sublimated into the subjective "beauty." At the same time, each artist has a different aesthetic angle to distinguish the surface and inner interest of things, which is a distinct "aesthetic tendency." Compared with traditional music, the visual elements created by technical means, such as images and animations of digital media art, are constantly applied to music performance. In the process of application, whether digital media art is used correctly, whether it achieves the effect, and whether it is artistic and scientific, Sex requires in-depth exploration and rational consideration. If you lack the overall grasp of digital media technology and music and art creation, it will quickly become a pile of technical means lacking aesthetic grasp. It is in a state of overuse and abuse in various musical and artistic performances and related performing arts activities, large and small. This kind of stereotyped stacking of technologies and equipment is often not helpful for expressing the creative intention of music art and even has the opposite effect [12]. The normal development of music and art activities hinders the excellent interaction between performances and seriously violates digital media art services' principles and original intention. Music art presentation has been reduced, the overall artistic expression has been reduced, and the audience's and the industry's aesthetic taste has been misled.

The application of music emotion in my country still needs to be narrower, especially in the combination of technology and artistic presentation, which is integrated into the public environment and health. There needs to be more relevant Research. Looking at the relevant literature on this technology in our country, we can find that Research on music, emotion, and Chinese traditional art culture exists.

3   CNN-LSTM AUDIO EMOTION MODEL OPTIMIZATION

Brainstorming music emotion classification systems is usually done by unimodal emotion classification. According to the data content of different modalities, the feature representation related to emotion is extracted, and the corresponding classification model is input to perform emotion classification [26]. The existing single-modal music emotion classification system is shown in Table 1:

Modal data	Classification model
audio frequency	LLDs+ machine learning
	Spectrogram + deep learning
lyric	Word bag model + machine learning
	Word vector + deep learning

Table 1: Existing single-modal music sentiment classification methods.

As shown in Figure 1, the model adopts CNN to characterize the problem of music word vectors with too high dimensions. The extraction is further compressed, followed by LSTM serialization.
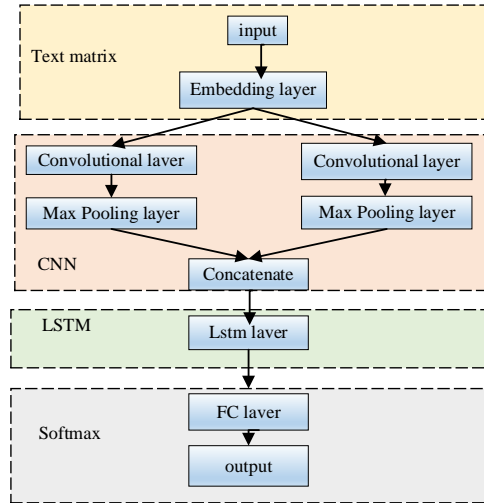
Figure 1: Optimizing the CNN-LSTM classification model.

Some scientists have combined the two theories based on some connection between the two theories of emotion. Among all the research results, Pletcher's three-dimensional model of emotion is widely accepted [19]. In the type, basic emotion archetypes combine to form various human emotions, such as anger and disgust, which combine to generate contempt. Considering the emotional intensity, three-dimensional space can be used to build a dynamic model. This three-dimensional moving model can reflect the changes in different emotional intensities and their opposite natures [3]. Tchick divides emotions by similarity, polarity, and intensity, and the thus-formed cone model is shown in Figure 2. Eight sectors represent the eight basic emotions. In the two-dimensional space, each primary emotion has a different location. For example, sadness is in a position of high negativity and low arousal; happiness is in a position of high positivity and high arousal.
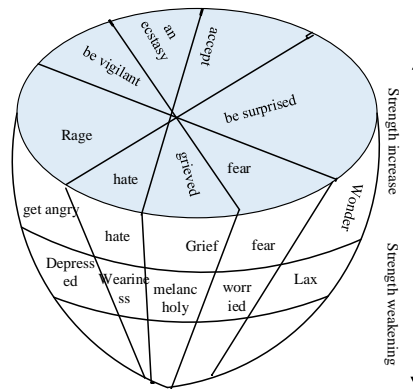

Figure 2: The optimized 3D emotional model of music.

Used to represent the probability of the occurrence of the next item in a sequence. The likelihood of the sentence appearing can be calculated using the formula.

$$p(s) = p(w_1)p(w_2 \mid w_1)p(w_3 \mid w_2 w_1) \dots p(w_l \mid w_1 w_2 \dots w_{l-1}) = \prod_{i=1}^{l} p(w_l \mid w_1 w_2 \dots w_{l-1}) \quad (1)$$

In Bigram, the probability of sentence S is as follows:

$$p(s) = \prod_{i=1}^{l} p\left(w_l \mid w_1 w_2 \ldots w_{l-1}\right) \approx \prod_{i=1}^{l} p\left(w_{|} \mid w_{l-1}\right) \tag{2}$$

The commonly used calculation method of P is as follows:

$$p\left(w_{/} \mid w_{/-1}\right) = \frac{c(w_{/-1}w_l)}{\sum_{w_l} c(w_{|-1}w_l)} \tag{3}$$

And so on to the N-gram model. When n>2, the probability of the sentence appearing is:

$$p(s) = \prod_{i=1}^{l} p\left(w_l \mid \begin{matrix} i-1 \\ i-n+1 \end{matrix}\right) \tag{4}$$

The P-value can be found using the maximum relief estimate:

$$p\left(w_l \mid \begin{matrix} i-1 \\ i-n+1 \end{matrix}\right) = \frac{c(w_{i-n+1}^l)}{\sum_{w_l} c(w_{i-n+1}^i)} \tag{5}$$

After the weight is obtained by calculating the TF-IDF function, the formula is shown as follows:

$$\chi 2 \sum_{i=1}^{n} p\left(C_i\right)^2 (t, C_i)_{avg} \tag{6}$$

Therefore, the pros and cons of public environmental facilities should not only be based on their aesthetics as the final evaluation standard [13]. It is a functional device that facilitates people's lives, and it is also an active element that cares about people's emotional experiences and promotes people's communication activities. The inheritance and development of musical emotions require not only the promotion of artistic creators but also the protection of the promotion of musical emotions.

4   METHODS

Music emotion is essential to finding and organizing music information [4]. The recognition of emotion is a complex problem in many music information retrieval problems, and its difficulty lies in the lack of easy-to-obtain prior knowledge, which makes automatic detection of music emotion difficult. Preparing enough prior knowledge to supervise learning is usually necessary when recognizing and classifying music emotions. Music emotion is a subjective perception of human beings. Inviting multiple subjects to listen to them is generally required to obtain prior knowledge. Music and recording their emotional experiences and feelings [15]. This traditional way of data collection tends to be a labor-intensive and time-consuming process, and the labeling process could be more efficient, error-prone, and costly. Currently, the method based on the data model is widely used, and its general process is shown in Figure 3.
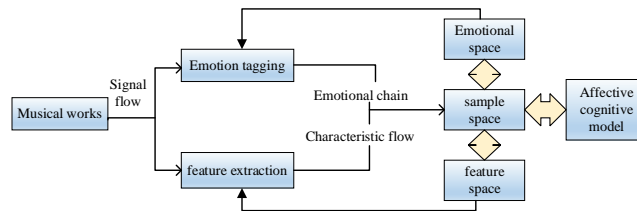

Figure 3: The general process of establishing a music emotion cognitive model.

The environmental protection principle of urban public environmental logo design is mainly reflected in the materials used. Environmentally friendly production materials reflect the harmony between the logo and people, and more importantly, they can remember the harmony between the logo and the natural environment to bring people closer to each other. The distance from the natural

environment to realize the symbiosis and co-prosperity of man and nature [10] fusion method, that is, after the feature extraction stage, the feature data of different modalities are directly spliced or some rules are fused, and the fused feature data is classified. The classifier outputs the classification results. The feature-level fusion method is a fusion method before the classifier's output. It fuses the features in the vector space and outputs its emotional representation directly through a unified classifier without relying on the correlation between modalities for decision-making. After the audio features and music feature representations are extracted, multimodal fusion is performed to judge the overall emotion of the music. Multimodal fusion methods generally include decision- and feature-level fusion, as shown in Figure 4.
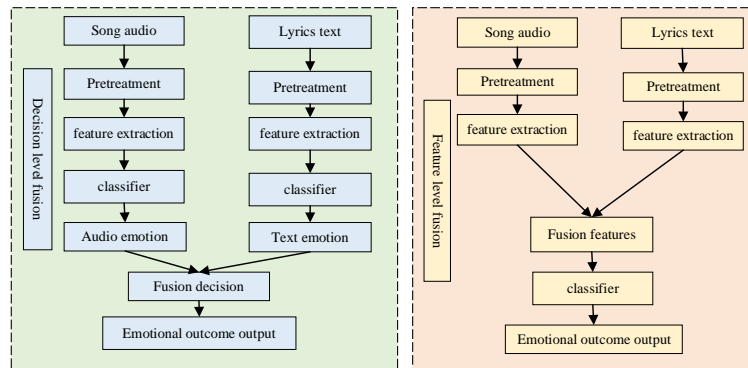
Figure 4: Multimodal fusion framework.

The simplicity of urban public environment sign design helps the public remember and find their wayfinding goals relatively quickly. On the one hand, the simplicity of the design of urban general environmental signs is mainly reflected in the design of form and graphic symbols so that "form follows function." Rationalized design and layout, using a combination that is easy to disassemble and easy to maintain or replace, avoids the large consumption and occupation of resources due to the complexity of the design, and the simplicity of the graphic symbols enables people to quickly find the purpose and bring people a good imagination at the same time. The expanded view of the model is shown in Figure 5.
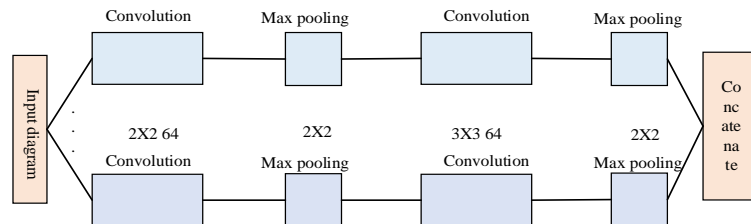
Figure 5: Mimic fusion of CNN layers.

SVM is developed from the situation that the optimal classification surface exists linearly separable, which can be described by a graph. In Figure 6, the asterisk and the pound sign represent the sample data of different categories: the main classification line, the closest classification line of the pound category, and the nearest classification line of the asterisk category. The distance is called the classification interval.
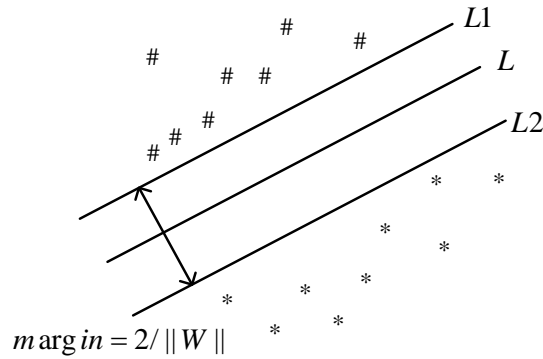
Figure 6: Optimal classification line in the case of linear separability.

The relevant formula is as follows:

$$h_{1F}(i) = f(W_F \cdot X(i: i + F - 1) + b) \tag{9}$$
$$h_{1F} = [h_{1F}(1); h_{1F}(2); \cdots; h_{1F}(H)] \tag{10}$$
$$hr_{1F} = relu[h_{1F}] \tag{11}$$

Musical art presentations are presented in various ways, but they have one stark commonality: algorithmic instructions are written in real time. The live programming artist Collins pointed out in 2011: "The more profound the live programming is, the more algorithms the performer has to face, and the more important the intervention in work is, the deeper the live programming behavior will be." The entire feature model is roughly as shown in the figure. This paper selects the input music format. First, the basic features such as pitch, length, and intensity are extracted from the notes in the music. Secondly, two methods are used to obtain other information besides the three basic information. Finally, mathematical statistics are carried out on this information to get the final output vector, as shown in Figure 7.
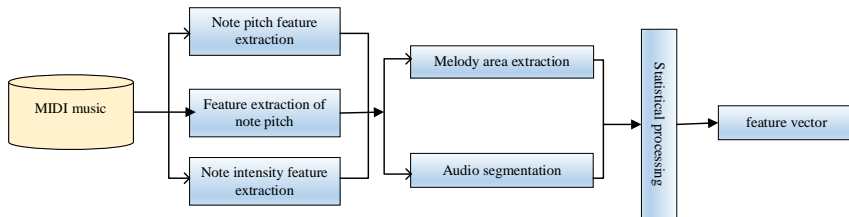

Figure 7: Feature model intent.

The performer uses the music material generated by the algorithm in real-time to control its subtle elements directly or indirectly. This new control method presents music as a new form of art.

5 CASE STUDY

It is also a significant content in music recommendation. With the development of Internet technology, all kinds of musicians emerge in an endless stream, and tens of thousands of new songs are continuously generated daily. Facing the explosive growth of massive amounts of data every day, online music platforms need to classify music promptly and be able to recommend new music to users in need accurately. This group of experiments analyzes the effects of four preprocessing audio segmentation methods on the audio classification effect. In the experiment, according to

different datasets, the features of LLDs are input, and the SVM classifier is used for sentiment output. The classification accuracy of the four datasets obtained in the experiment is shown in Table 2.

data set	Classification model	anger	happy	relax	Sadness	average
30s original segment	LLDS+SVM	0.517	0.46	0.483	0.484	0.484
15s original fragment		0.624	0.542	0.487	0.507	0.538
15s pure background sound		0.581	0.524	0.503	0.681	0.572
15s pure voice		0.513	0.429	0.448	0.523	0.478

Table 2: Classification accuracy of different preprocessing methods.

From this, we can get a sequence of time unit melody area values. The picture shows an example of a time unit melody area sequence connection diagram, as shown in Figure 8:
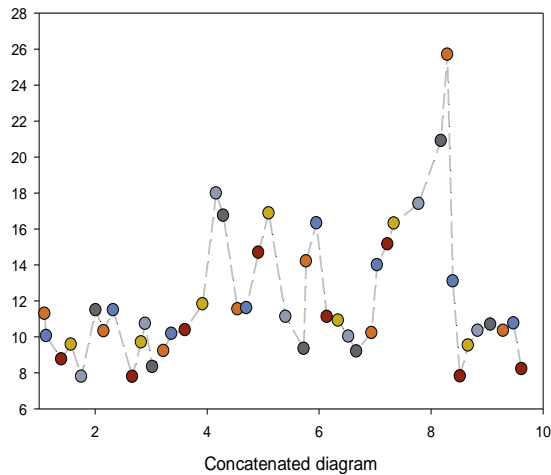

Figure 8: Concatenated diagram of melody area sequence per time unit.

Adopting appropriate ecological technologies will help enhance the ecological benefits of the public environmental space, reduce energy consumption, promote ecological balance, and efficiently use the general environmental space in the city's central area. First, the expanded spectrogram LLDs are spliced to form fusion features, and feature dimension reduction is performed by principal component analysis. In the experiment, to control the variables, SVM is used as the primary classifier, and LLDs and fusion features are used as the classifier's input, respectively. The classification accuracy obtained from the experimental results is shown in Table 3.

Audio Characteristics	classification method	anger	happy	relax	Sadness	average
LLDS	SVM	0.59	0.524	0.503	0.67	0.572

Spectrogram + LLDS		0.63	0.577	0.537	0.72	0.612

Table 3: Classification accuracy of different audio features.

The public environmental space in the city's central area should make full use of natural resources, actively use clean energy, reasonably allocate functions, reduce the consumption of resources based on recycling, and form an excellent ecological environment, which can be appropriately set up in the public environment. Based on the single-modal classification model based on CNN-LSTM [9],[21],[18], this paper constructs a feature-level fusion method, which further extracts and compresses features by deconstructing the single-modal classification model, avoiding the loss of emotional information in the process of direct feature fusion, as shown in figure 9.
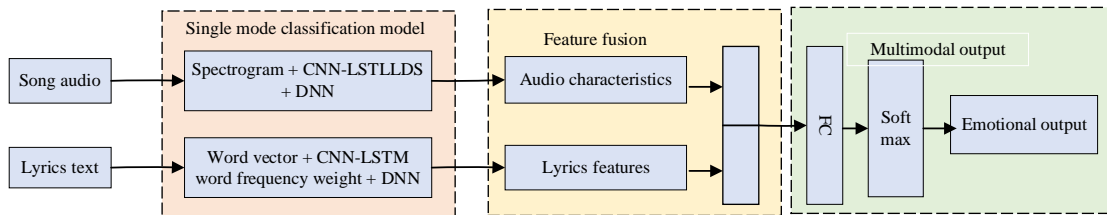

Figure 9: Feature-level fusion model.

Taking the positive emotion theory of positive psychology and the theory of health education curriculum as technical guidance, take the class as a unit and stimulate primary school students through music activities. Self-potential, cultivate and enhance the positive emotions of primary school students, and promote their healthy group psychological counseling activities. The designed music system has four modules divided into four parts: music emotion analysis module, music action library module, music arrangement module, and music and music output module. The flow of the virtual music system is shown in Figure 10.
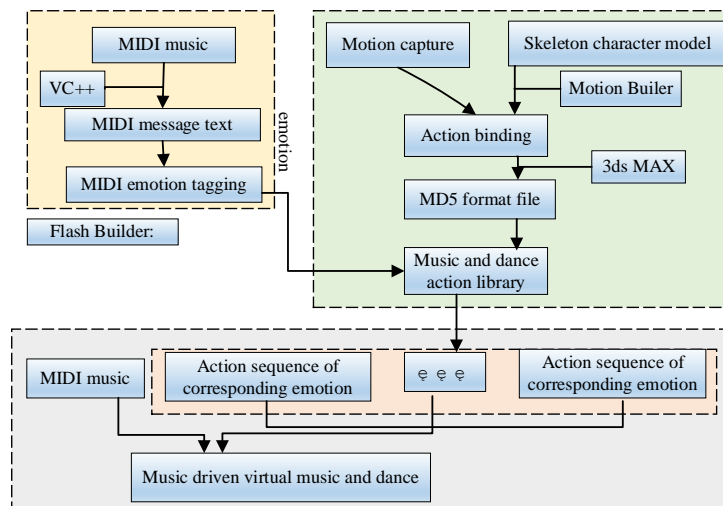

Figure 10: Flow chart of virtual music system.

100% of the people think that the eight emotions can be divided into two categories, and 86.67% of the testers have the same division method as the author. In comparison, only 13.33% have a different division method, and only one emotion in each category differs from the others. It is

different, and the difference is that the "lyrical" emotions are classified into the "intense" emotion category. After communicating with the experiencers, they also believed their original classification was inaccurate and adopted it. The division method was used by 86.67% of the testers. It can be considered that the author's analysis of the polarity characteristics of the Hefner emotional ring model is reasonable, and the dynamic division is relatively accurate, which can be recognized and accepted by most testers, and verifies the dynamic music analysis of the virtual music system above. Sentiment classification with music action library. The statistical results of users' sentiment classification of the Hefner sentiment ring model are shown in Table 4.

number	Experimental items	Proportion
1	Can the eight emotions be divided into two categories	100%
2	Category 1: warm, joyful, jumping, and voracious	86.68%
	Type 2: lyric, sacred, solemn, and sad	
3	Category 1: warm, joyful, jumping, and lyrical	13.34%
	Category 2: sacred, solemn, sad, and longing	
4	"Intense" and "soothing" can be used to describe the two types of emotions that the tester is divided into	93.34%

Table 4: User Sentiment Classification Statistics for Hefner Sentiment Ring Model.

Use the classifier files that have been trained in the classifier's training and testing modules, the audio library, and music feature library files that have been established in the music database's establishment module, and call the music emotion according to the user's input on the interface and parameter settings. The sequence similarity search module completes the search for similar music. The overall structure of the system is shown in Figure 11.
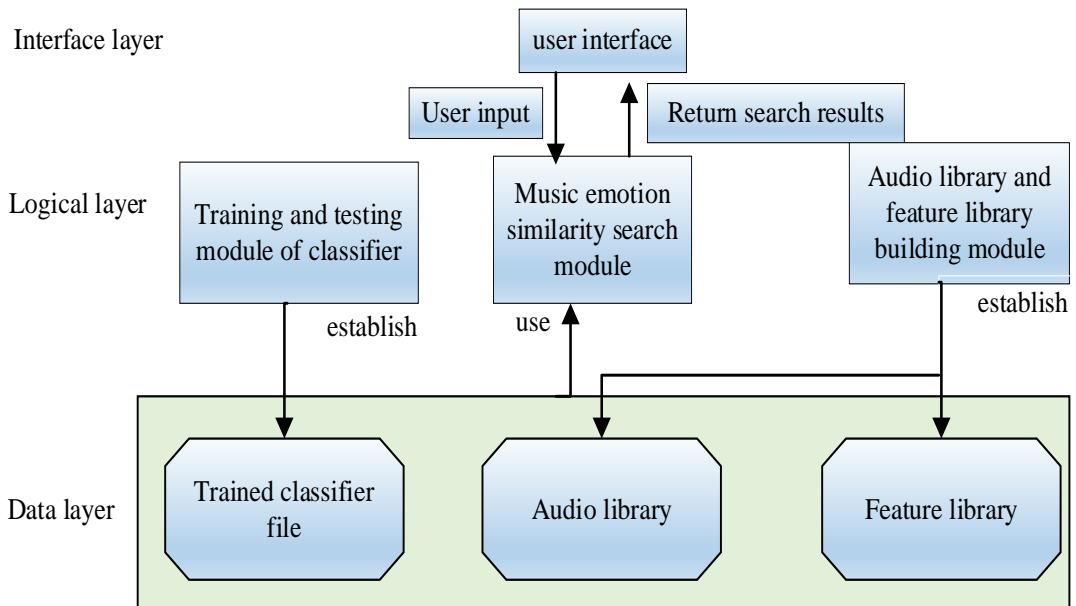

Figure 11: Overall structure of the system.

The operation flow chart of the audio classification module is shown in Figure 12.
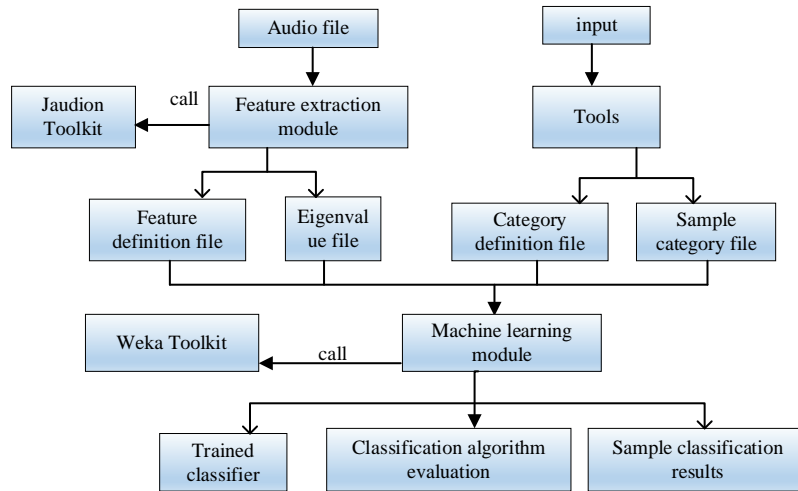
Figure 12: The operation flow of the audio classification module.

The experimental results are shown in Table 5. Four comparative experiments were set up, and different feature sets were used. SNG means that there are only emotional indicators, SNG+NEG implies that the influence of negative adverbs on dynamic polarity is considered based on dynamic indicators, and SNG+MDF represents the degree to which emotion. By modifying the strength of the demonstrative words, SNG+NEG+MDF means comprehensively considering inspirational, expressive words, negative adverbs, and degree adverbs.

Experiment No.:	Feature set	Accuracy	recall	F-value
FS1	SNG.	0.2348	0.1315	0.0842
FS2	SNG+NEG.	0.2399	0.5749	0.1693
FS3	SNG+MDF	0.3402	0.3513	0.1467
FS4	SNG+NEG+MDF	0.2399	0.3513	0.1871

Table 5: Experimental results of multiple feature sets.

The influence of degree adverbs is more significant than that of negative words. This may be because the sentences in the corpus rarely contain negative words and emotional words that appear in the same sentence simultaneously. Negative words have little effect on emotion prediction, but people use degree adverbs to express their emotions more accurately. In general, the careful consideration of degree adverbs and negative words has a positive effect on the prediction of emotion and can more accurately predict the emotional tendency of music.

To sum up, the attitude towards art is to integrate the public environment and health into the music's emotion, and the revealed philosophy is often superficial and relaxed. The attitude towards life lies in the artist's emotion in the artwork, originating from the artist's feeling for life. Such art presents the artist's love for life and his inner self-examination.

6 CONCLUSIONS

Based on music emotion recognition, an algorithm is designed to carry out user emotion recognition work. Finally, the user's short-term emotional tendency can be obtained according to the user's historical music-listening behavior. The experimental results verify the effectiveness of the algorithm. Emotion recognition for users for the platform can help the platform to understand users better and optimize the platform's recommendation strategy; for users, it is possible to obtain music that is more in line with their mood and situation, which is particularly important in today's information overload; Potentially depressed users are found in music playing behavior, which has significant social value. The amalgamation of medical insights into artistic presentations offers a platform to raise awareness and provoke thought about the profound relationship between public environments, health, and the emotions we experience, contributing to a more holistic understanding of wellbeing.

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