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Retraction

Retracted: Design of the Music Intelligent Management System Based on a Deep CNN

Security and Communication Networks

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Manipulated or compromised peer review

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] J. Shang and F. Shao, "Design of the Music Intelligent Management System Based on a Deep CNN," *Security and Communication Networks*, vol. 2022, Article ID 1559726, 9 pages, 2022.

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Research Article

Design of the Music Intelligent Management System Based on a Deep CNN

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Music is a common art form in people's life, and it is closely related to people's living conditions. Since ancient times, music has been closely related to people's lives. The music intelligent management system is convenient and user-friendly, and it can meet the demand for music. However, it has major flaws. Collaborative filtering algorithm can achieve the recommendation performance of music intelligent management system, which can recommend the same type of music to users with related preferences. Deep learning technology has developed relatively maturely, and it has been successfully applied in people's life and production. Deep convolutional neural network (CNN) techniques can extract deeper features than simple CNN techniques. Although there is a weak nonlinear relationship between people's behavioral characteristics and living habits and the music intelligent management system, the advantage of deep CNN technology is to deal with the nonlinear relationship between large amounts of data. This study uses deep CNN technology to extract the relationship between people's living habits, living environment, and behavior characteristics and the music intelligent management system. The deep CNN technology helps the music intelligent management system to further realize the active recommendation function of the music intelligent management system. The research results also show that the deep CNN technology has good feasibility and high accuracy in the music intelligent management system. It can well map the relationship between people's behavioral characteristics and living habits and the music intelligent management system. The deep CNN technology can also realize the active recommendation function of the music intelligent management system. For the prediction of the music intelligent management system, the largest prediction error is only 2.17%. This part of the error is for the prediction of song genres. The prediction errors for the other two features are both within 2%.

1. Introduction

With the continuous improvement of people's living standards, music has become a common way of life entertainment. Music can release and express people's emotions [1, 2]. If a person is in a bad mood, it can be vented in the form of music. Similarly, if a person is happy enough, he can also release his emotions in the form of music. Music has entered people's lives. Music has accompanied people's lives since ancient times. It is not only an art form but also an artistic sustenance for people to express their thoughts and feelings [3, 4]. In ancient times, people would express music in the form of books or musical instruments. However, with the advancement of technology and the advancement of various APP software, the recording of music can already be reflected through intelligent management systems, such as QQ Music, NetEase Music, and other music intelligent management systems. People can listen to and record their favorite forms of music and the words expressed in music through the music intelligent system. Each music intelligent management system will have its own advantages and prominent forms. People's pursuit of music intelligence software is also different [5, 6]. For example, some people like the interface form and the intelligent management system of QQ Music, and some people also like the simple interface of NetEase Music. However, this fondness stems from a love for music. The QQ Music and NetEase Music intelligent management systems are already the representatives of music management systems. They have collected a large number of music songs, which have different forms and

different eras of music. Music lovers can find their favorite music according to their own preferences and pursuits. The music intelligent system can also design a different form of music according to different time and different working places. This means that the music intelligent system has achieved a better level according to the habits and pursuits of music lovers. At the same time, the current music intelligent system has also realized the function of speech recognition, which can find suitable music songs and music expressions according to people's speech needs [7]. In general, the current music intelligent system has achieved a more detailed and more accustomed way. It is more convenient, and it can find suitable music forms according to the needs of different groups of people. However, the current music intelligent management system also has certain defects. It cannot implement music recommendations based on people's behavioral habits. This means that the music intelligence system still lacks a more intelligent music recommendation system. It can be understood that the music intelligent management system cannot realize the matching and playing of music forms according to people's behaviors. For the life of modern people, this is also a function that is urgently needed by the music intelligent management system. With the advancement of people's living standards and the level of science and technology, people's lives continue to develop in the direction of intelligence and automation. People's pursuit of the comfort of life is also constantly improving. The initiative of the music intelligent system is also an important direction.

Big data technology has developed to a relatively mature stage. It has functions such as speech recognition, image recognition, and active recommendation [8]. It is also used in many fields of life and production. If the big data technology is applied to the music intelligent management system, it can assist the music intelligent management system to realize the active recommendation function, which is also a relatively new way [9]. The deep convolutional neural network technology (CNN) in big data technology can better complete the data mapping relationship [10, 11]. If deep CNN technology is used to map the relationship between music lovers' behavior and living environment and the music intelligent management system, it can improve the function of the music intelligent management system, which is also a better application direction. Deep CNN technology has been relatively easy to implement in today's rapid development of hardware devices. Big data technology can capture data related to people's living habits and hobbies, and it can also map the relationship between these related data and the music intelligent management system. This can efficiently and accurately establish the relationship between people's life behavior and the music intelligent management system.

Deep CNN technology is also a variant of CNN, and CNN already has good compatibility in deep learning training platforms [12, 13]. Deep CNNs have deeper network layers and more computational parameters. They can extract features of deeper research objects. Compared with shallow CNN, deep CNN has higher accuracy in dealing with more complex features. It already allows us to build any desired forms of CNN. Deep CNN technology can identify deeper features. There are relatively complex features for the behavioral characteristics, living environment, and other characteristics of music lovers and the recommendation of the music intelligent system, which is a mapping relationship that is difficult to achieve with shallow CNNs. This is because people's behavioral habits and the environment have changed greatly, which means that there are relatively large fluctuations in characteristics. This requires more data to provide more features, in order to learn the nonlinear relationship between people's behavioral habits and the recommendations of the music intelligent management system. However, the major defect of the deep CNN is that it has more parameter operations, which requires higher computing power of the computer. The implementation of the deep CNN needs to pose a greater challenge to the performance of GPU [14].

The acceleration ability of GPU for the deep CNN is obvious. However, the CNN also has certain advantages; that is, it has a certain weight sharing mechanism, which greatly reduces the computational complexity of parameters compared with fully connected neural networks and long-short-term memory neural networks. At the same time, the behavioral characteristics, living environment, and music intelligent management system involved in this study have little temporal correlation, so this study did not use long-short-term memory neural networks to map the temporal correlation between features. In order to improve the utilization and calculation speed of the computer and GPU, this study only considers the use of deep CNN technology in the music intelligent management system.

This study uses deep CNN technology to extract the characteristic relationship between music lovers' behavior, living environment, and living habits and the music intelligent management system. Moreover, this research uses the collaborative filtering algorithm to realize the active management of the music intelligent system, which accepts the output data of the CNN. This study will present relevant introductions from the following five aspects: Section 1 mainly introduces the research significance of the music intelligent management system, the existing defects, and the research significance of deep CNN technology. It also introduces the significance of the fusion of deep CNN technology and the music intelligent management system. The related research status of music management is illustrated in Section 2. Section 3 mainly analyzes the design scheme of deep CNN technology in the music intelligent management system and the working principle of deep CNN technology. Section 4 introduces the feasibility of applying deep CNN technology in the music intelligent management system in the form of the average error and scatter plot. Section 5 describes the relevant conclusions of the application of deep CNN technology in the music intelligent management system.

2. Related Work

Although the music intelligent management system has achieved great success, it can make corresponding music recommendations according to people's needs. The music

intelligent management system is also a large market demand. However, there are still great improvements and deficiencies in the transliteration intelligent management system. Many researchers have also conducted a lot of research on music management. Cheng [15] used the teaching task of music appreciation in a middle school in Zhejiang to design a multimedia teaching system with environmental requirements by means of an object-oriented method. This multimedia technology music system includes the functions of music online teaching, music retrieval, student management, and design of music. It can reasonably improve the teaching environment for students to learn music, and it can also improve students' interest in music learning. The results show that this music multimedia technology improves students' music appreciation ability. This has improved a certain reference value and reference for the school's music teaching and management. Hu and Yang [16] have found that school music teaching has the problems of few courses and lack of music management. In order to improve students' interest in music learning, it uses deep learning technology to study its role in music teaching management. It uses deep learning models to verify the accuracy of traditional music as well as mobile music and current music courses, as well as accuracy in image recognition. The research results show that the combination of the music teaching model and deep learning is a feasible technology. Under the influence of deep learning models, music courses offered by schools will also increase. This has a great effect on improving students' interest in music and mastering the art of music. Garcia-Peinazo [17] explored the role of podcasting technology in teaching music situations. Through podcast technology, students can understand, experience, and examine the advantages and differences between Western music art and Chinese music art. Podcasting technology also promotes the way students mediate and manage music. Finally, it also discusses the importance of podcasting technology for music teaching. The findings suggest that this technology can facilitate the development of music teaching, and it can also improve students' interest and understanding of music. Liu [18] also found that music was also an important part of colleges and universities. Informatization has also entered the management of colleges and universities. It thinks that the information construction and the management of music in colleges and universities have great defects. This research mainly uses the embedded multicore processor to study a set of the music information management system in colleges and universities. The system was also tested and trained using machine learning algorithms, and traditional music systems suffer from low accuracy. This music information system can achieve high accuracy, and it can achieve efficient and stable operation. Zhang et al. [19] analyzed the relationship between music data and users with the help of the NetEase cloud music management system. It mainly analyzes the source of NetEase cloud data and the relationship between the creator's data and users. These data also include data about user clicks, likes, and followings. The database and management mode of NetEase cloud can provide more reference value for the research of other music management systems. This is

mainly reflected in the connection between NetEase cloud's database and users. Zhang [20] designed a fog computing model for the resource management system of music and dance. This model will use Internet of things technology to effectively classify the resources of music and dance. It also improves the traditional NSGA-II (fast nondominated sorting genetic algorithm-II) algorithm to test and study the problem of music and dance resource allocation. The research results show that the improved NSGA-II algorithm has better performance in music and dance resource management, and it has relatively stable performance. This research focuses on realizing the active recommendation technology of the music intelligent management system according to people's living habits and changes in living environment, and it adopts the intelligent algorithm of the CNN.

3. Application of Deep CNN Technology in the Music Intelligent Management System

3.1. The Significance of Deep CNN Technology. Deep CNN technology can extract deeper features of research objects. However, deep CNN technology has more complex parameter computations than shallow CNN technology. There is a complex relationship between the music intelligent system and the behaviors and living environment of music lovers, which requires deep CNN technology to extract the relationship between the music management system and the research object. This can lead to underfitting if a shallow CNN technique is used. In the process of mapping the music intelligence management system and behavioral features, it will cause the loss function to be in a high position. However, it will also be in a steady state. This can easily lead to misjudgment by researchers. This is because the shallow CNN cannot extract more features. Deep CNN technology generally has more than 5 layers, and it also has a large number of filters. As the feature extraction process continues to iterate, the number of filters will continue to decrease. Shallow CNN techniques have been widely used in many fields. The first is that there is a relatively simple nonlinear relationship between them. The second possibility is that the research subjects have relatively low requirements for prediction errors. Deep CNN technology also has high requirements on the number of datasets.

3.2. The Principle of the Deep CNN Technology in the Design of the Music Management System. The overall goal of this research is to use deep CNN technology to extract the behavioral characteristics, living environment characteristics, and living habit characteristics of music management systems and music lovers. In addition, this research study maps the nonlinear relationship between the music management system and these three characteristics. Ultimately, it will utilize deep CNN technology to implement active recommendation technology for music management systems. Active recommendation means that the music management system can recommend music and turn on music according to people's behavior changes, changes in living environment,

and music lovers' habits. Most of the current music management system is a passive management mode, which will only make a series of responses and music output according to people's needs and active access to the music management system. The music management system of the active recommendation mode will realize the tasks of active opening and active recommendation of the music management system according to the real-time changes of these three characteristics. This music management system with active recommendation function is more intelligent. In order to achieve the recommendation performance of the music intelligent management system, it adopts an object-based collaborative filtering algorithm. It can recommend the same type of music to users with specific related habits and behavioral preferences. Figure 1shows the application scheme of deep CNN technology in the music intelligent management system. The input data of this study are people's living habits, hobbies, and living habits, and the label data are the music duration, song name, and music type. Deep CNN technology will extract the features of these three kinds of data. Then, this study also utilizes a coordinated filtering recommendation algorithm, which will recommend music that matches the characteristics. This study used deep CNN technology to realize the active recommendation technology of the music intelligent management system. Once the model of the deep CNN and collaborative filtering algorithm is trained, it can realize real-time music recommendation according to people's behavioral characteristics, changes in living environment, and changes in people's habits. These music recommendations may include data such as the type of music, the songs of music, and the broadcast duration of music. After extracting the characteristics of life-related factors of people in this study, it will output data such as the type of music and song name, which will be actively recommended by the music intelligent management system.

The deep CNN technique is also a variant of the CNN method, which will include multiple layers of CNN structures. Most deep CNN techniques will contain more than five CNN layers. The deep CNN will extract more musical features, behavioral features, and environmental change features. Figure 2 shows the workflow of the deep CNN, which is also a one-layer CNN structure in deep CNN technology. CNN also has the same basic structure as the perceptron, and it also uses the distribution of weights and biases to realize the mapping of nonlinear relationships. There are also many similarities between the CNN and the fully connected neural network. It also uses the loss function to calculate the difference between the predicted value and the actual value. It also uses gradient descent to find the direction of gradient descent for the weights. The weight sharing mechanism allows CNN to develop towards a deeper level.

For the deep CNN, the input layer needs to undergo convolution operations, which is the difference from fully connected neural networks. Equation (1) shows the calculation method of the input layer of the deep CNN, which will include convolution and matrix operations.

$$V = \text{conv2}\left(W, X, ''\text{valis}''\right) + b. \tag{1}$$

Equation (2) shows the output computation of the deep CNN, which is the output after feature extraction of multiple layers of CNN, which also requires nonlinear transformation of the activation function.

$$Y = \phi(V). \tag{2}$$

Equation (3) shows the computational algorithm for a layer of the deep CNN. Convolution operations and feature flipping will be involved here. Equation (3) shows the calculation method for feature flipping 180°. The feature filling operation will also be involved here. For missing features, it will run in a filling way.

$$\delta^{l-1} = \text{conv2}\left(\text{rot180}\left(W^l\right)\delta^l, '\text{full},\right)\phi'\left(v^{l-1}\right). \tag{3}$$

The loss function is a function that every neural network must have. It will be responsible for calculating the size of the error between the predicted value of the model and the actual value, which will affect the direction and trend of gradient descent. The loss function stops iterating until the model converges. Equation (4) shows one way of calculating the mean squared error.

$$E = \frac{1}{2}\left(d_{\text{out}} - O_{\text{real}}\right)^2 = \frac{1}{2}\sum_{\kappa=1}^{t}\left(d_\kappa - O_\kappa\right)^2. \tag{4}$$

Equation (5) shows a derivation calculation criterion for the weights. The derivative calculation is to find the direction of gradient descent.

$$\Delta u_{ij} = -\eta\frac{\partial E\partial}{\partial u_{ij}}. \tag{5}$$

3.3. Application of Coordinated Filtering in the Music Intelligent Management System. In this study, after deep CNN technology has extracted music features, behavioral features, and environmental features of music lovers, it can map the nonlinear relationship between the music management system and people's behavioral features. This research utilizes the collaborative filtering algorithm to realize the active recommendation function of the music management system. The deep CNN will only complete the mapping of nonlinear relationships, and the collaborative filtering algorithm will actively recommend the corresponding music and duration of the music management system based on these relationships. The content recommended by the collaborative filtering algorithm is the information that users are more concerned with. Collaborative filtering algorithms are mainly divided into object-based collaborative filtering algorithms and user-based filtering algorithms according to their functions. An object-based collaborative filtering algorithm recommends music with similar characteristics to users. This study adopts an item-based recommendation algorithm. A collaborative filtering algorithm is an important recommendation system, which can recommend users or objects. Application in the music intelligent management system can recommend music types and songs according to people's living habits and other characteristics.

The goal of the collaborative filtering algorithm is to find similarities between data. Equation (6) shows that the data use the cosine of the included angle to calculate the distance
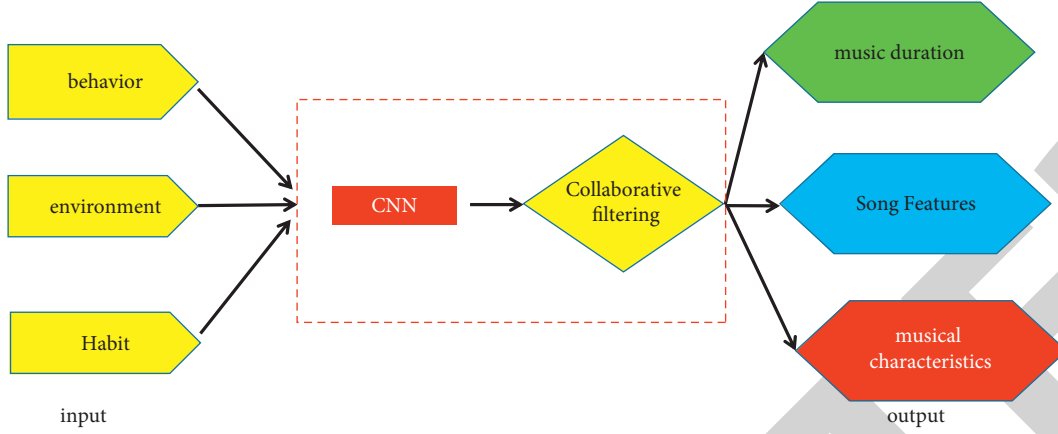
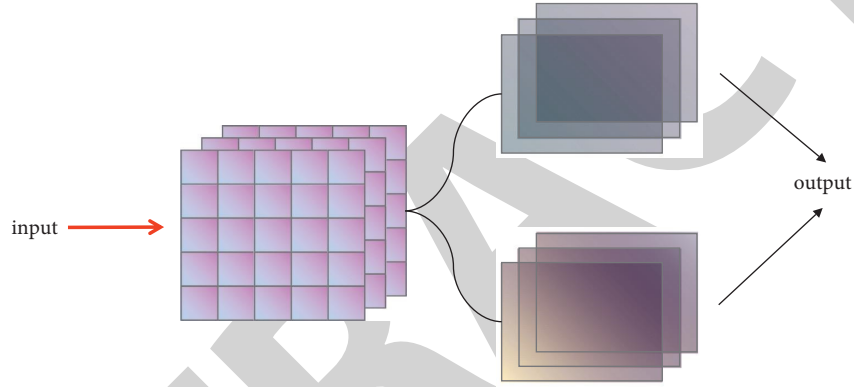FIGURE 1: Application scheme of deep CNN technology in the music intelligent active recommendation system.

FIGURE 2: Workflow of the deep CNN.

between the data. Equation (7) is an expanded form of Equation (2). The cosine of the included angle is a common way of solving the distance in collaborative filtering algorithms.

$$\cos \theta = \frac{a \bullet b}{|a||b|}, \tag{6}$$

$$\cos \theta = \frac{\sum_{k=1}^{n} x_{1k} x_{2k}}{\sqrt{\sum_{k=1}^{n} x_{1k}^2} \sqrt{\sum_{k=1}^{n} x_{2k}^2}}. \tag{7}$$

Equation (8) presents a similarity method calculation value criterion based on user associations. It needs to calculate the Pearson-r correlation of the data characteristics of the two subjects. When calculating the similarity between datasets using the cosine of the similarity angle, it needs to consider the influence between datasets. Equation (9) shows how the similarity is calculated when this effect is taken into account.

$$\operatorname{sim}(i, j) = \frac{\sum_{u \in U} (R_{u,i} - R_i)(R_{u,j} - R_j)}{\sqrt{\sum_{u \in U} (R_{u,i} - R_i)^2} \sqrt{\sum_{u \in U} (R_{u,j} - R_j)^2}}, \tag{8}$$

$$\operatorname{sim}(i, j) \frac{\sum_{u \in U} (R_{u,i} - R_u)(R_{u,j} - R_u)}{\sqrt{\sum_{u \in U} (R_{u,i} - R_u)^2} \sqrt{\sum_{u \in U} (R_{u,j} - R_u)^2}}. \tag{9}$$

Equation (10) shows how the weighted similarity of datasets is calculated. Such weights refer to similar information about different subjects.

$$P_{u,i} = \frac{(s_i * R_{u,N})}{|s_{i,N}|}. \tag{10}$$

4. Result Analysis and Discussion

This study uses deep CNN technology to map the relationship between the behavioral characteristics, environmental characteristics, and habitual characteristics of music lovers and the music intelligent management system. After the deep CNN completes the relevant feature extraction, it will use the collaborative filtering algorithm to complete the active recommendation technology of the music intelligent management system. This music intelligent management system consists of two parts. One part is to complete the prediction of relevant features, and the other part is to complete the active recommendation of music. The dataset used in this study comes from actual data from multiple universities, which will ensure the accuracy and practicability of the model. The data on living habits and music-related characteristics used in this study were derived from research data in Beijing. When the data are collected, they
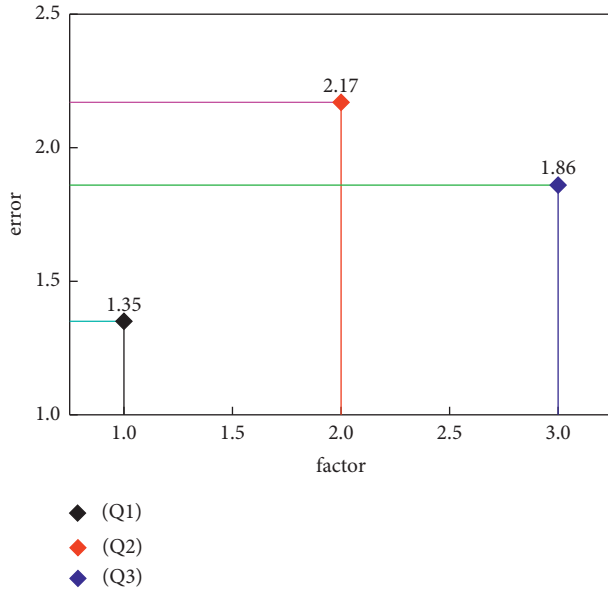
Figure 3: Prediction error of the collaborative filtering algorithm in the music intelligent management system.
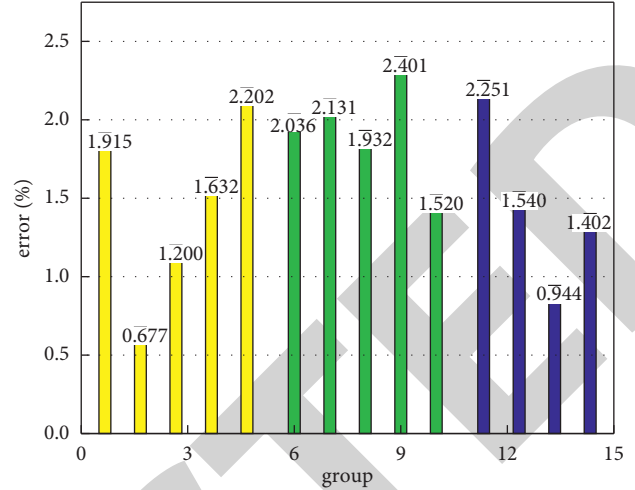

Figure 4: Prediction error distribution of song features using the deep CNN methods.

Figure 5: Distribution and change of predicted and actual values of song features.

need to be divided into behavioral, environmental, and habitual characteristics of music lovers. The data of the recommendation function of the music intelligent management system will be divided into music form recommendation, song type recommendation, and music duration recommendation. This is the key to the music intelligent management system.

In this section, the first part will introduce the accuracy of the collaborative filtering algorithm. It will output the recommended duration of music, music type, and song type. The active recommendation function of the music intelligent management system mainly uses people's behavioral information to recommend music-related features. Figure 3 shows the recommendation accuracy of the collaborative filtering algorithm. Q1 represents the prediction error of the recommended duration. Q2 represents the prediction error of the song genre. Q3 represents the recommendation error of the music genre. Overall, the collaborative filtering algorithm has high accuracy in recommending the relevant features of the three types of music based on people's behavioral information. The recommendation error for music duration is only 1.35%, and the recommendation of music duration is relatively easy. The music duration has a relatively large fixed feature, and it does not fluctuate much because everyone basically listens to music during the day or evening; the probability of listening to music at night is relatively low. This forms a certain habit characteristic. The recommendation error of the song type is relatively large. This part of the error reached 2.17%. There are relatively large fluctuations in the type of songs, and it will also be updated in real time.

Through the above analysis, it can be found that the song type and music type are relatively difficult to predict for the collaborative filtering algorithm. This study selected 15 sets of data to investigate the accuracy of the deep CNN
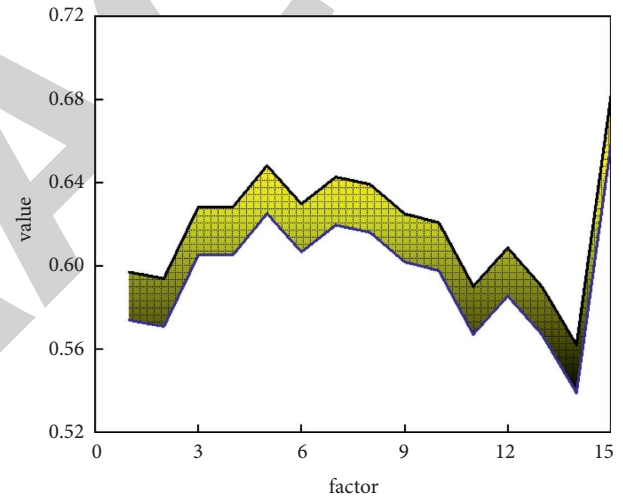
techniques in predicting music-related features for three predictive features. Figure 4 shows the distribution of prediction errors for song features for 15 test sets. The yellow histograms represent the data from the first 5 test sets. The blue histogram represents the data of the next 5 test sets. In conclusion, this study divided 15 sets of test set data into 3 groups of histograms with different colors for analysis. Overall, all prediction errors are distributed within 2.5%, which is a sufficiently accurate prediction error for the music intelligent management system. Most of the errors are also distributed within 2%, with only five sets of data having prediction errors exceeding 2%, which range from 2% to 2.5%. There are large differences in song characteristics for different populations. For the same person, there is a greater correlation between song features and the environment and behavior. At the same time, songs are constantly updated over time, which leads to large fluctuations in song characteristics. This error can also prove that the deep CNN
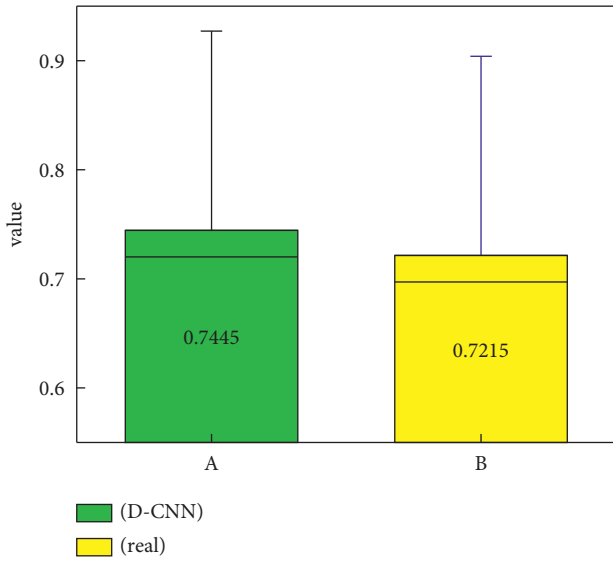
Figure 6: Box distribution of predicted and actual values of music genre features.
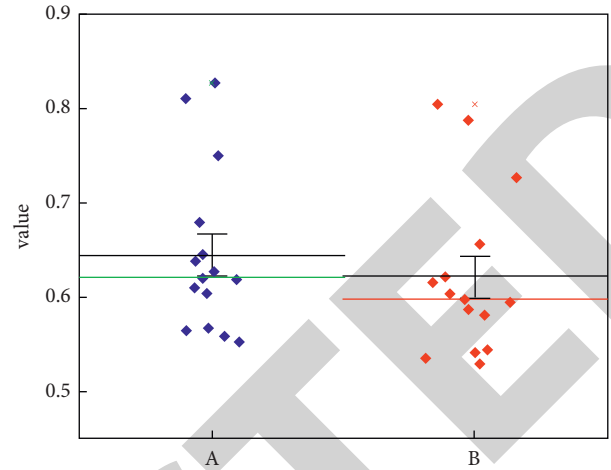

Figure 7: Distribution of predicted and actual data points for music duration features.
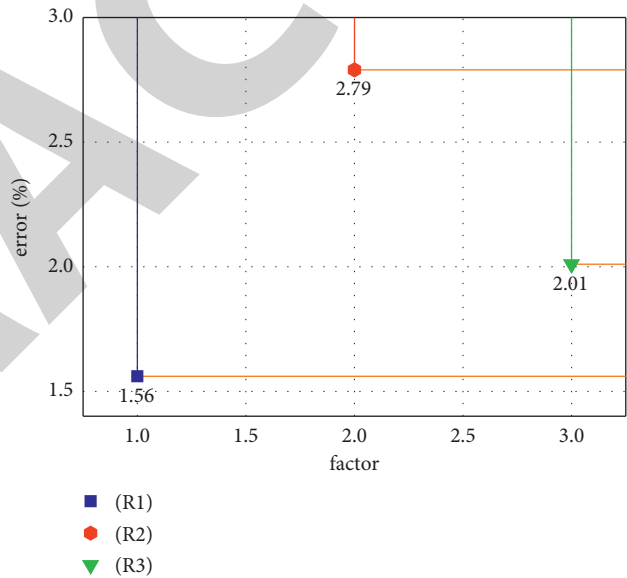

Figure 8: Average prediction error of three features of the music intelligent management system using the deep CNN method.

technology can be trusted in the music intelligent management system. There are also a small percentage of prediction errors within 1%, which may be a less demanding group of songs.

Through the analysis of Figure 4, it can be found that there is a strong temporal correlation between song features. The songs in the music intelligent management system are constantly changing. Therefore, this study also investigates the deep CNN method in predicting the changing features of song features over time. Figure 5 shows the distribution of predicted and actual values of song features. The yellow area is the error between the predicted value of the song feature value and the actual feature value. In general, the predicted values of song features have a high degree of agreement with the actual values. Although there are large fluctuations in song characteristics at different times, deep CNN technology can still effectively predict the fluctuation characteristics of song characteristics, which show the feasibility and effectiveness of deep CNN technology in music intelligent management systems. In the early days of the forecast, there is a relatively large error here. However, in the later stages of song feature prediction, this error gradually decreases.

The distribution of the box can visually display the distribution of the predicted value and the actual value, including the average value and the distribution of all values. There are also large fluctuations in music genres for different groups. This is also related to changes in the environment. This makes musical features more difficult to predict. Figure 6 shows the bin distribution of the predicted and actual values of music features. In general, there is a large similarity between the predicted value of the music feature and the actual value of the box. The difference between the predicted value and the mean of the actual value is also relatively small. This can also demonstrate the feasibility and dependability of deep CNN techniques in predicting musical features of music management systems.

For the three characteristics of the music intelligence system, the music duration is the easiest to predict for people who like music and listen to music at a fixed time. For people who have a certain interest in music, the duration of this part of the music is more difficult to predict. Figure 7 shows the predicted distribution of music duration features. Green and red areas represent the mean distribution of music duration features. The black line represents the median distribution of the music duration feature. The blue area represents the distribution of the predicted value of the music duration, and the red dots represent the distribution of the actual value of the music duration. Overall, the blue and red areas have relatively similar distributions, and the value in the blue area is close to the value in the red area, which means that the predicted value of the music duration feature is close to the actual value. This can further

illustrate that the deep CNN method can also successfully predict the music duration characteristics in the music intelligent management system. Figure 8 shows the relative mean error distribution of the deep CNN technique in predicting three characteristics of the music management system. On the whole, most of the errors also meet the needs of the intelligent music management system, and the largest prediction error is only 2.79%. This part of the prediction error is the prediction error of song features, which is also the most difficult to predict. However, the prediction of this part of the characteristics has already met the needs of the music management system.

5. Conclusions

Since ancient times, music has always existed in people's lives in the form of an artistic feature. With the advancement of technology, numerous music management systems have emerged, which can meet people's needs for different types of music. It also allows more people to go to the fascination of the music field. Although the music system can meet most people's needs, it is a passive management system. The current music management system has an active recommendation function, which is the so-called active recommendation of music. This research uses the deep CNN method and the collaborative filtering algorithm to realize the active recommendation technology of the music intelligent management system, which can actively recommend music according to people's behavior, environment, and habits.

In this study, it first uses the deep CNN to extract people's behavioral information, environmental characteristics, and habitual characteristics to map the music duration, music characteristics, and song characteristics of the music intelligent management system. In general, deep CNN technology has high feasibility in the music intelligent management system. All prediction errors are within 3%. The lowest prediction error is only 2.79%. This part of the error mainly comes from the prediction of song features, which is also the most difficult part of the entire music intelligent management system to predict. The second step is to use the collaborative filtering algorithm to realize the active recommendation technology of the music intelligent management system. The collaborative filtering algorithm has also reached a certain level in the music intelligent management system. For the recommendation research of the three characteristics of the music intelligent management system, all the prediction errors are also within 3%.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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