

Intelligent Software for Multi-Ethnic Spectrum-Assisted Vocal Music Teaching Based on Intelligent Audio Classification Algorithm

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Abstract: Aiming at the currently used parameters are mainly static features, a dynamic feature calculation method based on information theory is proposed, and the initial value in key frame extraction is set according to its physical meaning, and the A algorithm is used to decompose the tensor, and then a tensor-based model is proposed. classifier. The experimental results show that the characteristics of the tensor model have a certain improvement effect on the problem of violent audio classification. National vocal music is the concentrated expression form of the Chinese national characteristic culture, showing many characteristics and potentials. Recognizing the strengths and weaknesses of each other's culture establishes a theoretical foundation, finds a new theoretical fulcrum for re-evaluating the value of different music cultures fairly and reasonably, and provides the necessary international quality for cultivating talents in the new century.

Keywords: Intelligent Software, Multi-Ethnic Spectrum, Vocal Music Teaching, Intelligent Audio Classification Algorithm

1. INTRODUCTION

With the widespread application of multimedia and Internet technologies, there is an increasing demand for efficient audio data retrieval [1]. Audio classification is an important method to extract structured information and semantic content in audio, and it is the basis of audio understanding, analysis and retrieval. Audio classification mainly includes two basic aspects: feature extraction and classification [2]. In terms of feature extraction, it has been widely used in artificial intelligence fields such as image recognition, but it is still rarely used in the field of audio sentiment analysis [3].

However, some studies have shown that the VGGish network can extract more comprehensive and complex features of the data, which can lay a good foundation for intelligently analyzing the emotion of audio information [4]. The traditional method is to manually review the audio and video uploaded by the user. Due to the large amount of network multimedia, the manual method will waste a lot of manpower. Therefore, an algorithm is needed that can automatically identify violent content [5]. Audio is an important part of multimedia information. The traditional method is to manually review the audio and video uploaded by users. However, due to the large amount of online multimedia, the manual method will waste a lot of manpower. Therefore, an algorithm is needed that can automatically identify violent content [6].

Audio is an important part of multimedia information. Our country is a multi-ethnic country, and excellent traditional culture has a long history. As a form of China's excellent traditional culture, national vocal music is inheriting and promoting folk songs and rap in various places [7]. With the continuous improvement of the level of education informatization, intelligent teaching has gradually become a trend, and the integration of information technology into vocal music classroom teaching also become inevitable [8]. Based on the premise that the country vigorously promotes the reform policy of music teaching curriculum in primary and

secondary schools, this research has very important theoretical and practical significance [9].

Since the formation and promotion of the concept of multiculturalism, the traditional music teaching model has been greatly affected, and has been unable to meet the teaching standards of music courses [10]. The current era is an era in which industrial civilization is turning to post-industrial civilization. The era of modern knowledge-based transformation; the impact of the fourth industrial revolution has had a profound impact on traditional music production methods, teaching methods and learning methods, and the new teacher-student relationship and teaching concepts are facing reconstruction [11].

The oppression of cultural identity by the wave of globalization. In order to allow users to efficiently access the specific segments retrieved, it is necessary to organize the management of audio data and perform appropriate encoding format conversion, and establish an application-oriented, encoding Unified [12], easily searchable audio library. However, the amount of audio data is often very large. When the audio signal changes with time, information changes must occur between frames, so this paper uses information theory to calculate dynamic features [13]. In terms of classification, the vector space model is a classic method in information classification, but in the similarity calculation, only the matching information of the weight vector is considered, and the relevant information between the feature items is ignored [14].

Since most of the features of audio signals are extracted based on frame granularity, for each sample. The extracted original feature is a matrix composed of the feature sequence of the frame [15]. Traditional methods often need to convert matrices into vector features for classification. Compared with other traditional methods, the classification algorithm has higher classification accuracy, faster calculation speed, is more suitable for processing large amounts of data, and is more intelligent, such as electrocardiographic signals [16]. As

a treasure of traditional Chinese music culture, ethnic vocal music is becoming more and more important. more attention. While the teaching of ethnic vocal music in colleges and universities is developing rapidly, there are also many problems. Therefore, in the perspective of multiculturalism, we must carry out targeted teaching reforms to promote better and faster development of ethnic vocal music [17].

The construction of intelligent teaching requires that vocal music teachers in higher vocational schools can make full use of various forms of wisdom to further enrich the teaching content of vocal music courses, and form a new teaching ecology that is more intelligent and more in line with the needs of students, so as to promote the development of students' innovative thinking and improve the vocal music classroom teaching effectiveness [18]. Since most of the features of audio signals are extracted based on frame granularity, for each sample. The extracted original feature is a matrix composed of the feature sequence of the frame. Traditional methods often need to convert matrices into vector features for classification [19].

2. THE PROPOSED METHODOLOGY

2.1 The MFCC

The audio stream is divided into frames, and each frame signal is calculated to obtain a 13-dimensional feature vector, including 12-dimensional MFCC coefficients and 1-dimensional dynamic features. K-means is used to cluster the feature space, and the initial centroid is selected according to the physical meaning of the audio dynamic features, that is, the entire frame feature vector of the audio is quickly scanned. For a given number of components, from the effect point of view, the alternating least squares (Alternating Least Square) is a relatively efficient algorithm.

A large number of experiments have proved that the ALS algorithm has a good trade-off between the computational cost and the quality of the result, and is easy to implement, guarantees convergence, and is easy to extend to high-order tensors. ANN can process some environmental information that is very complex, the background knowledge is unclear, and the samples have The problem of pattern recognition with large defects or distortion is very suitable for classifying radar signals, but due to its long training time and poor real-time performance. The design idea is realized. It provides a high-throughput, scalable, and scalable distributed file system. It can be quickly deployed on cheap servers. It is a highly fault-tolerant distributed system. It relies on the redundancy mechanism between nodes to perform data backup and recovery and provides high-throughput data storage functions. It is suitable as the storage basis for massive data. In VSM, the TFIDF formula is used to calculate the weight of keywords, that is, the product of word frequency and inverse document frequency.

In the audio frame vector sequence, the frame frequency cannot completely and accurately measure the influence of the key frame. When the number of clustered frames in which the key frame is located, that is, the greater the frequency, the greater the effect of the key frame on distinguishing audio. Considering the large amount of data and it is not meaningful to retain the characteristics of each frame, here The eigenvectors of adjacent frames are averaged, so that the obtained eigenmatrix can more accurately express timing information and is more meaningful. In the actual transmission of the signal, the number of training samples obtained is very limited. At this time, it is difficult for many methods to achieve the ideal classification effect. Even in the

case of limited training samples, the use of a complex learning machine can make the learning error smaller, but generalization feature is often worse.

2.2 The Multi-Ethnic Spectrum Assists Vocal Music Teaching

My country has a vast territory, and under the colorful natural environment and cultural style, the vocal art of various regions presents the characteristics of distinct personality and multi-layered diversity, and the singing methods of each ethnic group have certain differences. Therefore, the content of ethnic vocal music teaching Also involved in a wider range. In the current vocal music teaching work, teachers must rely on rich and diverse digital teaching resources to carry out intelligent reform of teaching methods. However, from the survey of the current degree of digitization of vocal music teaching resources, it is found that there are only less than 40% of the existing resources. At the same time as the development of global integration is gradually deepening.

In a modern society, China must constantly make changes, so as to better cater to the changes in the world's cultural situation. The driving force for the development of popular music lies in the commercial operation. Coupled with the influence of various factors, it affects the development and inheritance of traditional folk music culture. The rise of multicultural music education is closely related to the multicultural trend of thought in the world. Although "cultural diversity" as a cultural phenomenon has a long history in human society, "multiculturalism" as a social thought started in the early 20th century. Since the beginning of the new century, due to the proliferation of separatism and populism. Heavy. Calculate the class pattern of a certain type of audio set D in the entire training set, form a feature space of the frame sequence of all audio files of this class, perform clustering to obtain the key frames of this type of audio file, and calculate the frame distribution information as the weight, so we get A class pattern of , which represents this class of audio.

Chinese national vocal music is the rich accumulation and artistic expression of traditional Chinese culture. It is deeply loved by the public for its clear rhythm, beautiful melody and sincere emotion. Diversification has gradually become the main direction of the development of music culture. Teachers should analyze reports in real time according to their learning situation, generate dynamic teaching content, and accurately match high-quality digital resources to students' learning needs, so as to form specific teaching courses. How to organize these materials becomes the problem, and this is where the organization structure of the content arises. Because of the existence of subordination and logical relationship within the subject knowledge itself.

2.3 The National Spectrum Assisted Vocal Teaching Smart Software Design

The correct recognition rate for the three signals is close to 0.99, so the classification algorithm has a good generalization ability and overcomes the problem of excessive dependence on the model. The radial basis kernel function or polynomial kernel function of different parameters has no obvious effect on the performance of the algorithm. Influence. We must open our horizons, not blindly impart various techniques of Western singing to students, but truly achieve mutual reference and communication between the various branches of ethnic singing and Western singing, and create a college

ethnic group that belongs to traditional Chinese culture and art.

The road to teaching vocal music. From the above process of rhythm training and teaching, it can be seen that once rich resources and accurate data analysis tools are available, the diversified application and precise adaptation of existing high-quality teaching forms can be realized in the development of multicultural music teaching. In the process, the daily study life and music teaching should be integrated. While teaching traditional music knowledge, some other music elements should be integrated to enrich the teaching content. Huang Zhen ^⑩ expounded on the application of multicultural music. In the history of education development, there are various educational theories, such as humanism, behaviorism, eternalism, progressivism, constructivism, critical theory, etc. There are different philosophical positions behind these theories. Such as the rationalist philosophy behind eternalism, the mechanical materialism behind behaviorism, etc.

There are many classification algorithms for data mining, such as decision tree, regression analysis, Bayesian, neural network, support vector machine, etc. Curriculum setting is the basis and orientation of teaching. To build a perfect Chinese national vocal music teaching system, make the teaching content meet the requirements of Chinese national vocal music teaching reform. Then 10 students independently carried out the corresponding knowledge learning according to the requirements of this module, and participated in the learning of other modules according to the plan, and finally completed a practical teaching exercise for preschool children according to the learning plan.

3. CONCLUSIONS

The improved VSM algorithm proposed in this paper can better obtain the key information in the data. It adopts the sequence of key frames and weights, and preserves the relationship between the audio auditory characteristics. The relevant information of the audio frequency is preserved, the tensor features are constructed, the feature matrix of each sample is projected and dimensioned, and a classification method based on the tensor model is proposed. The most important task of national vocal music teaching is to establish a sound education system to fully reflect the national characteristics. College teachers need to closely link ethnic culture and vocal music teaching, only by accurately grasping the characteristics of students, combining advanced ethnic music teaching ideas and teaching theories, and highlighting the pertinence of teaching.

4. REFERENCES

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