Research Article

Application of Artificial Intelligence Technology in the Teaching of Complex Situations of Folk Music under the Vision of New Media Art

Ning Li¹,² and Md Jais Bin Ismail²

¹Aba Teachers University, Aba Prefecture, Sichuan 623002, China
²Conservatory of Music, College of Creative Arts, Universiti Teknologi MARA (UITM), 40450 Shah Alam, Selangor, Malaysia

Correspondence should be addressed to Ning Li; 20109602@abtu.edu.cn

Received 13 December 2021; Revised 19 January 2022; Accepted 21 January 2022; Published 14 April 2022

1. Introduction

Nowadays, the music education has acquired more attention to the Chinese students. In terms of the social circumstances in which they were composed and performed, Chinese folk songs fall into three categories: work songs, mountain songs, and little tunes [1]. Some of China’s twenty-two provinces are home to Han people, the country’s most prevalent ethnic group. These three diverse techniques can be used to teach students about the Chinese rural culture [2]. Chinese folk songs are very different musically from Western music, and students will need to know this to have fun singing them. The pentatonic nature of Chinese folk songs and the tonal scaffolding structure that underpins them are examples of their distinctive musical components [3]. Nature’s pentatonic scale is a musical notation system. It is one of the five pentatonic modes (scales with five pitches) that is utilized in Chinese folk songs, as opposed to the two diatonic modes that are employed in Western music [4]. While Western music’s diatonic major and minor modes feature intervals such as minor second and triplet, the pentatonic mode does not include these intervals. In Chinese music, the dissonance is less of a concern than it is in Western music, which is a result of this characteristic [5]. In addition to the three-tone pattern, the three-tone pattern is an important component of Chinese folk song melody. If you employ a three-tone pattern in the Chinese pentatonic scale, you can build it with any three successive tones from the scale. This mode contains three distinct three-tone patterns that are based on...
the original intervallic structure of the scale. They are as follows: because of the limited resources and instructor strength available in traditional classes, one-on-one individualized instruction for each student is not possible [6]. As Internet-based education becomes more popular, traditional education is no longer restricted by time and place limits and instead creates a virtual learning environment that can be accessible at any time of day or night [7]. With the development of online learning platforms, it is now possible to learn at your own speed and from any location. These platforms provide a wide range of services for students, including individual tutors who may provide one-on-one assistance. If learning platforms are to achieve genuine personalization, they must engage with students, recognize their unique characteristics, and deliver personalized teaching services for specific learners by mimicking teachers’ teaching techniques [8]. Individual learning habits and preferences are discovered through the use of simulated verbal communication and behavioral analysis and simulation in order for learners to understand their individual learning styles and preferences [9].

Many high-quality artificial intelligence products have been developed in recent years, including data mining and artificial neural networks, which have made it easier to create intelligent guidance systems [10, 11]. Musical training is a discipline. Sight-reading is a course that teaches students how to read, sing, memorize, and recognize music. One of the most sought-after skills in the realm of professional music teaching has always been the ability to read music [12]. For a long time, students were taught sight singing and ear training in the classroom, which is not only unproductive but also has a negative impact on students’ excitement for learning and their lack of self-motivation [13]. Despite this, the use of multimedia tools and teaching software in the classroom has increased; however, these tools (software) can only be used to aid in teaching, and the existing online courses do not meet the requirements of intelligent teaching. In many visual singing learning systems, there is a paucity of study into the design and implementation of intelligent-guided approaches, which is owing to a lack of research into the design and implementation of intelligent-guided approaches [14]. It is necessary to rely on manual assessments to fully automate and intelligently assess learners’ skill levels. It is too difficult for learning tools to be tailored to the needs of students [15]. There is a fundamental flaw in the assessment method because it only considers the discrepancies between the template and the performance. Experts’ subjective judgments rather than standardization create an unfair advantage for them in determining the difficulty level of the score [16]. Personal preference will be utilized to balance the complexity of the test questions to ensure fairness, correctness, and objectivity in the assessment of sight-singing lessons. It is tough for current sight-reading systems to handle multiple-choice and multiple answer questions that get more difficult as time goes by [17].

As part of the ABRSM’s evaluation system, students are placed into one of the eight groups based on their playing methods, scales, and other aspects of their musical development. Six grade standards are used by the New York State School Music Association (NYSSMA) to categorize students’ proficiency in various aspects of music theory and performance. There are three levels of pitch and rhythm difficulty according to the SSMA syllabus: easy, moderate, and tough [18]. Creating a sight-singing ear grading syllabus research has recently focused on the use of textbooks or scores with clearly defined difficulty levels, linear regression support vector machines, and other methods for difficulty recognition to build an automatic prediction system that can be used for the automatic classification of scores by a large number of unlabeled results [19]. An illustration of this is the long-studied topic of melodic complexity as a primary success measure in arousal research. The preference for music and its ability to stimulate the senses make it an important part of the human experience [20]. Using melodic complexity as a diagnostic tool, these studies show how melodic contingencies can be identified and which aspects of melody (pitch combinations, hierarchical structure and sequential order, and so on) are more important for parsing together melodic structures when parsing together melodic structures (similarity ratings, melodic repertoire, etc.) [21].

There has been a rise in the popularity of “melodic complexity models” since Eugene Narmour argued that the implicit realization model was unsuitable for original folk melodies since it did not account for listeners’ musical and cultural backgrounds [22]. Experimenters utilized an expectation-based model (EBM) to explore the effects of tone (which was impacted by pitch and rhythmic position), interval principle of range direction, and rhythmic principle slicing to predict listeners’ assessments of complexity (which were influenced by tonality) [23, 24]. When building a model, the choice of features and algorithm work hand in hand. The validity of musical clustering algorithms was explored by the researchers, who discovered that they were valid when using a generally applicable model of standardized information distance. The researcher did well on seven datasets where melodic complexity evaluations were collected and performed well according to information theory and expectation violation [25]. Music scoring is all about determining how closely recovered melodic attributes match the template melody and how much the template melody’s notes deviate from the test participants’ singing performances. An understanding of melody begins with an understanding of its three foundational elements: pitch, mel to spectral coefficients, and its resonant frequency [26]. Pitch data may be extracted with the SHS algorithm, and MFCC features can be extracted with the fast Fourier transform. By selecting resources based on the difficulty of the examination or study questions, you may help your students learn while simultaneously assessing their knowledge when you apply an algorithm. Recently, the DTW approach, which uses distance to compare differences, has become increasingly commonplace [27]. Many variables can affect the results of a study, including the sort of characteristics utilized or the combination of characteristics used, among other things; these are just a few examples. The purpose of this study is to examine an intelligent guidance system for music sight-reading as a useful model and design reference. Both a pitch sequence matching difficulty evaluation and an algorithm
for calculating the best possible score are given as part of this study. To better distinguish the complexity of a score, a new collection of features has been developed and is found to be more accurate than earlier techniques [28].

As a sight education singer is very technical, the ability to identify and differentiate between different levels of difficulty is critical [29]. Individually tailored recommendations for educational resources must be provided to pupils to accomplish this. Despite the fact that many studies have been done on intelligent guidance systems, it is only when these studies are combined with specific themes that the research on intelligent guidance systems becomes useful [30]. This endeavour aims to create models for intelligent tutoring systems that are based on current standard models while also including instructional components that are relevant and applicable to the subject of folk music. In this study, the teaching of folk music under the vision of new media art using artificial intelligence has been analyzed.

2. Materials and Methods

The folk music dataset of China is considered for this research. This dataset has China's rich and exciting music history. This recording includes folk songs from the five ethnic minority groups of Qinghai and Gansu regions: Tu, Bonan, Dongxiang, Yugur, and Salar. Like the titles of Chinese traditional visual arts, the song titles clarify the ambiance and the source of the song. It contains the frequency and time duration parameter for the source of the art based on the signals.

2.1. Motivation of the Study. Artificial intelligence (AI) has still not been widely used in folk music and media art education. As a result, the aim is to devise strategies for incorporating AI into art education. To that end, the authors analyzed the existing state of AI applications in art education and summarized the issues with these applications. Following that, the simplistic role of AI through art teaching was thoroughly examined, and devised techniques to encourage AI applications in the field of modern art teaching focus on (1) broadening the adaptability of AI-based art teaching, (2) improving the sophisticated teaching mode of art teaching, and (3) improving the interactive creation and environment of AI-based art teaching. Simultaneously, this proposed system performance analytical framework evaluates its implementation impact of AI in folk music and media art teaching. The goal is to quantify the impact of AI through folk music and media art in education and has a wide range of applications.

2.2. Architecture of the Proposed System. The architectural diagram of the proposed folk music teaching under the vision of new media art is presented in Figure 1. New media art is a current trending information technology used to improve visualization of any given data or content. This improvisation is performed with computer graphics, visual arts (which includes sound, digital, and others), animation, etc. The main advantage of these technologies is to enhance the student and teacher enhancement in the learning process. The teaching of folk music to the students through online media will be difficult. Teaching music involves instruments, and the student has to understand the parts of music instruments before learning music. A teacher with a musical instrument can be seen from the proposed model, and then, a teacher can utilize the new media art. New media art will aid in the visualization of the teaching through some graphic modes such as animation, 3-dimensional representation of the instrument, and enhancement of the teaching-learning process. The recorded video of the teaching is uploaded to the database. The system administrator will assist in the online education of the course with the new technology. He will monitor the recordings and updates made by the teacher. The database will be equipped with artificial intelligence technology to retrieve the information according to the student's need. When the recorded video of the course is more comprehensive, intelligent technology should split the video into micro-compartments and deliver the data. In this research, it is assumed that all the recorded video is of the size that is suitable to play in the stipulated time.

To address the decreasing influence of classical cultural representations, an investigation on the issue has grown in importance. This article investigates classical cultural expressions in folk music and media art direction against the backdrop of artificial intelligence. The investigational results demonstrate that the enhanced limited Broyden–Fletcher–Goldfarb–Shanno (L-BFGS) algorithm does have the lowest loss, and the shortest distance is much more than 500 of time use. Compared with the traditional test, the proposed model is a consistent and stable method. The decline is reduced by 65%, compared with the conventional art method. Its loss can be reduced by approximately 48%. Compared with the newly optimized Adam method, its failure is reduced by about 9%, which is a significant improvement. In this context, the L-BFGS algorithm is essentially a particular recipe for designing and possibly executing an artwork, including algorithms, functions, facial expression, and other inputs that ultimately decide the structure the folk music and media art would then take. This contribution could be numerical, information processing, or formative.

The digital content is analyzed to assess the application effect of AI through modern art instruction. This study discussed expert systems and chose several identifiers to analyze the system performance of AI through folk music and media art teaching. Some of the identifiers are art teaching methodology, art instructional methods, art effective teaching, teaching environment in art classes, folk music and media art teaching environment means, art teaching consequence, and art classroom setting. In this proposed system, an expert is used. A weighted judgment framework of performance measures is used as a scoring system. The system is built in the following manner.

2.3. AI Performance Evaluation in the Teaching of Modern Art. L-BFGS is a quasi-Newton optimization algorithm that approximates the Broyden–Fletcher–Goldfarb–Shanno
(BFGS) algorithm utilizing a limited amount of computer memory. It is a well-known approach for estimating parameters in machine learning. The goal of the algorithm is to minimize L-BFGS, like the original BFGS, steers its search through variable space using an estimate of the inverse Hessian matrix, whereas BFGS stores a dense $n \times n$ approximation to the inverse Hessian ($n$ being the number of variables in the problem), and L-BFGS stores only a few vectors that represent the approximation implicitly. The L-BFGS approach is particularly well suited for optimization problems with many variables due to its consequent linear memory demand. In this research, a sequential transformation model and the traditional double function iteration in the intelligent system are implemented. This function is used to find the self-similarity among the boxes to complete the required task. The interpolation transformation describes the image's transfer, scalability, flipping, precession, and shearing using a $3 \times 3$ matrix. The transfer function is as follows:

$$
\begin{bmatrix}
a' \\
b'
\end{bmatrix} =
\begin{bmatrix}
r_{00} & r_{01} & r_{02} \\
r_{10} & r_{11} & r_{12}
\end{bmatrix}
\begin{bmatrix}
a \\
b
\end{bmatrix} =
\begin{bmatrix}
r_{00} * a + r_{01} * b + r_{02} \\
r_{10} * a + r_{11} * b + r_{12}
\end{bmatrix},
\tag{1}
$$

where $a'$ and $b'$ are not only the image's true classification but also predicted input, respectively; $r$ is the number of classifications. The (L-BFGS) art algorithm functions to perform acceleration which is similar to the optimization of AI technique are used in this paper. This acceleration from each parameter is notified and evaluated using the following Equation (2).

$\begin{bmatrix}
1 & 0 & h_a \\
0 & 1 & h_b \\
0 & 0 & 1
\end{bmatrix}$
\tag{2}

where $h$ is the current number of training cycles, rounded down. The revolution of AI function is defined as cross-entropy, and the formula is in the equation (3):

Revolution

$\begin{bmatrix}
-\sin \alpha & \cos \alpha & 0 \\
\cos \alpha & \sin \alpha & 0 \\
0 & 0 & 1
\end{bmatrix}$
\tag{3}

where $\cos \alpha$ and $\sin \alpha$ using AI represent the limited number of samples in the training data set, and this article only fine-tunes on the zoom (in equation (4)) of the training set, so the $p$ is correction rate that cannot be too large. In this article, the initial correction rate of the model is 30%, and the correction rate increases by 80% every 2 cycles of training.

Zoom

$\begin{bmatrix}
pa & 0 & 0 \\
0 & pb & 0 \\
0 & 0 & 1
\end{bmatrix}$
\tag{4}

Scratch

$\begin{bmatrix}
1 & \tan a & 0 \\
\tan \lambda & 1 & 0 \\
0 & 0 & 1
\end{bmatrix}$
\tag{5}
The compressive transformation matrix is equal to the summation of equation (5). \( \tan a \) and \( \tan \lambda \) are vertical cracking and lateral cracking and are shown as follows:

\[
\begin{bmatrix}
1 & 0 & 0 \\
\tan \lambda & 1 & 0 \\
0 & 0 & 1
\end{bmatrix}
\begin{bmatrix}
1 & \tan a & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{bmatrix}.
\]

(6)

The conventional linear method takes on different characterization by various affine matrices to accomplish the required transformation and is represented in Equation (7):

\[
G_j(a, b) = (s_j a + d_j b + d_j, k_j a + f_{bj}^p + w_j).
\]

(7)

In the process of AI Transformation, \( s_j \) and \( d_j \) represents the nonlinear to acquire the data, and \( U_i \) is decided to perform the overall iterative process. \( f_{bj}^p \) represents the frequency analysis, \( k_j \) specifies the stop analysis. \( w_j \) denotes the continuous analysis.

\[
G_j(a, b) = U_i (s_j a + d_j b + d_j, k_j a + f_{bj}^p + w_j).
\]

(8)

Also, every dynamical variable \( U_i \) alters distinguishable features of a graph, including its shape (in equation (8)). The transition impact is further enlarged by allocating various weight coefficients \( U_{ij} \) to a dynamical emotional connection attribute \( U_j \) as follows:

\[
G_j(a, b) = \sum_{i} u_{ij} U_i (s_j a + d_j b + d_j, k_j a + f_{bj}^p + w_j).
\]

(9)

After performing a transformation matrix on the series of data points, the dynamical AI transform is committed to a result of such an iterative method (in equation (9)). A comment that can control locations is supplied as a result of both the discrete wavelet transforms. It can be said that a function \( O_j(a, b) \) is deduced from the dynamical result’s initial iterative method as follows:

\[
O_j(a, b) = (a, a + \lambda, x + \eta_j, \sigma a + \theta b + \tau_j).
\]

(10)

The \( O_j \) method iteration will be based just on significant improvement mentioned in the previous section. The following is the process formula:

\[
G_j(a, b) = O_j \left( \sum_{i} u_{ij} U_i (s_j a + d_j b + d_j, k_j a + f_{bj}^p + w_j) \right).
\]

(11)

A single simplistic iterative data are first subjected to the first convolution, to \( \sigma \), the discrete wavelet transform, and finally to the second iterative method; also \( \theta \) is recognized as post-transformation. The consolidated nonlinear function \( a, a + \lambda, x + \eta_j, \sigma a + \theta b + \tau_j \) could be set up to handle the transform consequence for such AI discrete wavelet transform, and the nonlinear transition coefficients \( u_{ij} \) could be operated to adjust its configuration as follows:

\[
\sigma = \sqrt{b^2 + a^2}.
\]

(12)

Forward and start reversing signal propagation completes the data analysis. Because each neuron’s mass and limit adjustment of AI in the hidden layer surface impacts whether the response error satisfies the criteria during the rear process, dynamic adjustment, i.e., multiple different versions, is required to follow:

\[
\theta = \arctan \left(\frac{b}{a}\right).
\]

(13)

Traditional digital components, including recorders and projectors, are among the most frequently used in the data collection process and are given in Equation (14) for the AI modern Folk Music and Media Art teaching. These equipment can also be used in home Folk Music and Media Art education processes.

\[
U_1(a, b) = \frac{\sin \theta + \cos \theta}{d_1 * \sigma^2 + d_2 * \sigma^2 + d_3 * \sigma} (b, a).
\]

(14)

Students might learn understanding more systematically and quickly with the following modifications in the computer components; quite an education method could indeed boost the number of learners (equation (15)), teach so much material in a particular time, and maximize the performance of teachers.

\[
U_3(a, b) = \left( e \ln(b) \right) 1 + b^2 a.
\]

(15)

The \((a \sin \theta + b \cos \theta)(b, a)\) goal of incorporating the \( U_3(a, b) \) AI into folk music and media art education is to present art material to learners in a more informative manner, to create a \((d_1 * \sigma^2 + d_2 * \sigma^2 + d_3 * \sigma)\) good learning environment, and to display initial design that incorporates technology as follows:

\[
U_3(a, b) = \left( \frac{a \sin \theta + b \cos \theta}{\sigma} \right) (b, a).
\]

(16)

3. Results and Discussion

This study investigates classical cultural expressions in folk music and media art direction against the backdrop of artificial intelligence (AI).

For the AI transformation and nonlinear changes, a single iterative primitive method is used. Also, in practice, integration of self-designed and secondary translation and rotation is used. The co-occurrence matrix is used to prepare the image for different variations before selecting the best image. In the AI transformation, \( s_j \) and \( d_j \) are nonlinear parameters to acquire the data, and \( U_{ij} \) is used to decide the overall iterative method. \( f_{bj}^p \) represents the frequency analysis, \( k_j \) specifies the stop analysis, and \( w_j \) denotes the continuous analysis based on Figure 2. Then, to improve the image quality and reduce the noise, the L-BFGS loss optimization technique is used. The image that extracted features from training, especially in comparison, prevents the issue of exceedingly tilted images with incorrect weights multiple times, summarizes the suitable style load interval, and finally modifies the variables to instantly render various types of fractal images, trying to break its single folk music and media art form and realizing the supplementary growth of spectral visual art.
The distinct pattern characteristic qualities of parameters $a$ and $b$ are more significant than two, implying that the multitemperature is accessible, consistent, and thus suitable for digital image operations, as shown in Table 1. The appropriate images for blending are filtered out, and the following splicing procedure is carried out. They are dispersed repeats and continuous cutting, as shown in Figure 3. To achieve the self-affine, absolute fineness, and independent pattern characteristics of spectral graphics, this type of visuals can be spliced by random locations in parameter as shown in Table 1, which needs different patterns of AI characteristic regular distribution and can be dispersed freely. Figure performance is joined indefinitely.

Also, every dynamical variable $U_i\, U_j\, (s, a + d, b + d, k, a + f^b + w, j)$ alters distinguishable features of a graph, including its shape. The transition impact is further enlarged by allocating various weight coefficients $U_{ij}$ to a dynamical emotional connection attribute $U_i$ as in equation (9) based on Figure 3. The implementation of AI technology is not yet advanced enough. Student responses for learning technology, a simulation model for folk music and media art innovative teaching, efficient learning partner in crime technology, and other technologies that people want to accomplish in art teaching are being researched. To some extent, AI can assist people, but it cannot replace people’s thoughts, which is a precisely unique identifier of humans. Modern AI art integration cannot achieve perfect meanings, attitudes, and symbolic analysis. Art forms vary and move with the times, but still, the significance of art remains constant. Artworks are usually known as qualitative thinking more in terms of creation and recognition; thus, AI is deficient inside the assessment of student art production in terms of visual appreciation. The present AI-based art teaching is just a simple realization of individualized spaces; it simply involves computers to accomplish fundamental art teaching and can reflect the benefits of AI application in folk music and media art integration. Only by trying to break the choke point of the mixture of AI and folk music and media art education, we will be able to fully utilize AI’s enormous potential for art education and learning (Figure 4).

Even though classical AI has enhanced students’ learning performance and enthusiasm to a certain level, it does not completely comprehend the students’ learning and cannot vary for each individual. It can ensure that every individual student participates in the learning process. A single simplistic iterative data are first subjected to the first convolution, to $\sigma$, the discrete wavelet transform, and finally to the second iterative method; also, $\theta$ is recognized as post-transformation. The consolidated nonlinear function $a, a + \lambda, x + \eta, \sigma, a + \theta, b + \tau, j$ could be set up to handle the transform consequence for such as AI discrete wavelet transform, and the nonlinear transition coefficient $u_{ij}$ could be operated to adjust its configuration as a result shown in Figure 4. To make the educators for active involvement within the teaching process, and to increase the individual students’ learning involvement, provide the comfortable environment and different reference directions through personal communication. These processes can be made easier with the technical advancements with AI that combines with digital methods and provide more robust technical assistance for modern education.

In the proposed system, the collected data have undergone a thorough investigation, and after fine-tuning, the information

---

**Table 1: Result analysis of folk music and media art co-occurrence matrix extraction features.**

| Parameter | Time (s) | Distinct pattern characteristics | Regular distribution |
|-----------|---------|---------------------------------|---------------------|
| $A$       | 0.721   | 0.843                           | 4.23                |
| $B$       | 0.54    | 1.306                           | 3.91                |
| $R$       | 0.382   | 1.954                           | 0.974               |
| $H$       | 0.429   | 2.563                           | 1.453               |

---

**Figure 2: Performance of folk music modern art co-occurrence matrix extraction features.**

**Figure 3: Statistics of art modern music using the intelligent online network-assisted teaching system.**
required to create Table 2 is extracted, as shown in the table above. We can learn from the data in the table by comparing and analyzing it in a variety of ways: 65 folk music datasets are extremely satisfied with the option, responsible for roughly 97% of the total population of educators, indicating that our investigation was more effective and this framework is much more efficient (Figure 5).

Traditional digital components, including recording devices and video screens, are the most frequently used digital means in modern education; they can also use such devices in in-home art education (shown in Figure 6). Teachers could use images, videos, and other media to make folk music and media art and alive. Having taken folk music dataset education as an instance, students could understand extra systematically and quickly with the modifications in the computer components. The modifications in the computer components for the education technique can expand the number of learners, instruct more material in a particular time, and improve the efficiency of educators. The aim of incorporating AI into art education is to present folk music and media art material to learners more effectively. Nevertheless, due to a lack of AI device facilities in art education, the preferred folk music and media art teaching consequences or teaching goals are challenging to accomplish.

According to the data presented in Table 3, the classification accuracy of the interpolation L-BFGS algorithm accuracy framework is 89.54%, and the accuracy rate is 87.23%. The first type of error (unusual data is viewed as errors) of the training and testing sets is 75.93% and 69.86%, respectively, and the second type of error (regular data are regarded as different types of data) is 83.76% and 79.95%, respectively, indicating that it can assure up the model’s validity to a specific extent.

Nevertheless, many existing studies have focused on implementing models in folk music and media art education. The current system faces difficulties on specific link execution of art instructions or creating procedures. In contrast, ignoring the overall process of planning AI technologies in folk music and media art teaching results in insufficient research on AI in art teaching. The insufficiency is because of compromising the integration of comprehensive and integrated strategies. To evaluate the performance, this research investigates the application of artificial intelligence in modern folk music and media art education from strategy analysis and model construction using inductive analysis and the similarity between AI and education. In this research, the existing algorithms such as gradient descent, Adam, and AdaDelta are compared with the L-BFGS algorithm, and based on the accuracy framework, L-BFGS provides the best performance result for training and testing is observed. The \((a \sin \theta + b \cos \theta)(b, a)\) goal of incorporating the \(U_3(b, a)\) AI into folk music and media art education is to present art material to learners in a more informative manner, to create a \((d_1 \cdot \sigma^3 + d_2 \cdot \sigma^2 + d_3 \cdot \sigma)\) good learning environment, and to display initial design that incorporates technology following on to getting the accuracy of 97% and 98% (Figure 7).
Table 2: Result analysis for statistics for modern art online teaching system.

| Parameter | Time to play | Distinct pattern characteristics | Regular distribution | General (%) | Satisfied (%) | Unsatisfied (%) |
|-----------|--------------|----------------------------------|----------------------|-------------|---------------|-----------------|
| Song 1    | 00:01:20     | 1.345                            | 1.633                | 4           | 79            | 50              |
| Song 2    | 00:02:26     | 1.943                            | 1.563                | 2           | 73            | 30              |
| Song 3    | 00:01:17     | 0.934                            | 0.654                | 3           | 82            | 56              |
| Song 4    | 00:01:11     | 0.964                            | 0.864                | 2.3         | 79            | 54              |
| Song 5    | 00:00:50     | 0.756                            | 0.456                | 1.3         | 81            | 34              |
| Song 6    | 00:00:43     | 0.563                            | 0.234                | 2.6         | 86            | 43              |
| Song 7    | 00:02:32     | 1.563                            | 1.756                | 3           | 79            | 54              |
| Song 8    | 00:00:54     | 0.345                            | 0.372                | 1.43        | 81            | 34              |
| Song 9    | 00:02:30     | 1.934                            | 1.853                | 3           | 82            | 45              |
| Song 10   | 00:02:41     | 1.655                            | 1.454                | 2           | 83            | 34              |

Figure 5: Performance analysis for the time taken to play different songs in distinct pattern characteristics and regular distribution.

Figure 6: Accuracy analysis table of the convolutional L-BFGS art algorithm.
4. Conclusions

In this study, the evaluation and development of folk music and media art are analyzed using artificial intelligence technology. The study proposed the L-BFGS algorithm for evaluating the performance of the given data. The proposed algorithm has been compared with the existing algorithms such as Adam, AdaDelta, and gradient descent. The dataset used to analyze the proposed work is folk music, which includes the folk music of ethnic minorities. When compared to existing algorithms such as gradient descent, Adam, and AdaDelta, the L-BFGS performance is noticeably better. To put it another way, the L-BFGS algorithm can be thought of as a recipe for creating a piece of art that includes elements such as algorithms, functions, facial expressions, and other types of input. This could be a numerical, information processing, or formative contribution. From this study, we can observe that the teaching of folk music has acquired more attention from the Chinese students. In future research, it is highly suggested to determine the measures to increase precision and recall without considering the accuracy.

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.

References

[1] Y. Liu and H.-W. Lin, "Construction of interpretation and presentation system of cultural heritage site: an analysis of the old city, zuoying," Heritage, vol. 4, no. 1, pp. 316–332, 2021.
[2] E. Kusumaningsih, I. N. Nadiroh, and N. Ibrahim, "Developing learning module for equalizing the competence of students in 1st piano minor course at Jakarta Institute of the arts," Journal of Computational and Theoretical Nanoscience, vol. 17, no. 2, pp. 840–849, 2020.
[3] A. Cigliati, Z. Duan, and B. Wohlberg, "Transcribing piano music in the time domain," Journal of the Acoustical Society of America, vol. 140, no. 4, p. 3038, 2016.
[4] M. Nobuko, "Analysis of synchronization of hand clapping at music listening by live performance and DVD performance," Japanese Journal of Music Education Research, vol. 47, no. 2, pp. 13–24, 2018.
[5] D. R. Kumar, "Review of machine learning algorithm on cancer classification for cancer prediction and detection," International Journal of Analytical and Experimental Modal Analysis, vol. 11, no. 12, pp. 3177–3186, 2020.
[6] T. Rao, "Analysis on the ideological and political construction of colleges piano teaching in the new era," Region-Educational Research and Reviews, vol. 2, no. 4, pp. 20–24, 2020.
[7] R. M. Potdar, M. R. Meshram, and R. Kumar, "Optimization of automatic PCG analysis and CVD diagnostic system," *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 11, pp. 3738–3751, 2021.

[8] E. Khachatrian, S. Chlaily, T. Elliott, W. Dierking, F. Dinessen, and A. Marinoni, "Automatic selection of relevant attributes for multi-sensor remote sensing analysis: a case study on sea ice classification," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 14, no. 99, p. 1, 2021.

[9] H. K. M. Tanaka, "Development of automatic analysis and data visualization system for volcano muography," *Journal of Disaster Research*, vol. 15, no. 2, pp. 203–211, 2020.

[10] C. S. Pitt, A. S. Bal, and K. Plangger, "New approaches to psychographic consumer segmentation: exploring fine art collectors using artificial intelligence, automated text analysis and correspondence analysis," *European Journal of Marketing*, vol. 54, no. 2, pp. 305–326, 2020.

[11] Y.-Z. Hsieh and S.-S. Lin, "Robotic arm assistance system based on simple stereo matching and Q-learning optimization," *IEEE Sensors Journal*, vol. 20, no. 18, pp. 10945–10954, 2020.

[12] C. Bousquet-Jette, S. Achiche, D. Beaini, Y. S. Law-Kam Cio, C. Leblond-Ménard, and M. Raison, "Fast scene analysis using vision and artificial intelligence for objectprehension by an assistive robot," *Engineering Applications of Artificial Intelligence*, vol. 63, pp. 33–44, 2017.

[13] J. Heer, "Agency plus automation: designing artificial intelligence into interactive systems," *Proceedings of the National Academy of Sciences*, vol. 116, no. 6, pp. 1844–1850, 2019.

[14] B. L. T. Sturm and O. Ben-Tal, "Folk the algorithms: (Mis) Applying artificial intelligence to folk music," in *Handbook of Artificial Intelligence for Music*, pp. 423–454, Springer International Publishing, Berlin, Germany, 2021.

[15] M. Mazzone, "Sound and image in new media art," in *Teaching Electronic Music*, pp. 208–222, Routledge, London, UK, 2021.

[16] B. Caramiaux and M. Donnarumma, "Artificial intelligence in music and performance: a subjective art-research inquiry," in *Handbook of Artificial Intelligence for Music*, pp. 75–95, Springer International Publishing, Berlin, Germany, 2021.

[17] C. Contreas-Koterbay, "The teleological nature of digital aesthetics-the new aesthetic in advance of artificial intelligence," *AM Journal of Art and Media Studies*, vol. 20, no. 20, p. 105, 2019.

[18] Y. Gong, "Application of virtual reality teaching method and artificial intelligence technology in digital media art creation," *Ecological Informatics*, vol. 63, Article ID 101304, 2021.

[19] S. Tianyu, "As the 'intellectual subject' of artificial intelligence - the intrinsic understanding of artificial intelligence on the ideas of 'time' and 'space'," *AM Journal of Art and Media Studies*, vol. 20, no. 20, p. 125, 2019.

[20] W. Wang and Z. Liu, "Using artificial intelligence-based collaborative teaching in media learning," *Frontiers in Psychology*, vol. 12, 2021.

[21] Y. Park, "Can artworks by artificial intelligence be artworks?" *AM Journal of Art and Media Studies*, vol. 20, no. 20, p. 113, 2019.

[22] E. M. Lee, "A design of artificial intelligence engine to understand abstract art based on expert system - an artificial intelligence engine to understand mondrian’s abstract art -", *The Korean Journal of Art and Media*, vol. 13, no. 2, pp. 103–118, 2014.

[23] Y. El Miedany, "Artificial intelligence," in *Rheumatology Teaching*, pp. 347–378, Springer International Publishing, Berlin, Germany, 2018.

[24] C. Wick, A. Hartelt, and F. Puppe, "Staff, symbol and melody detection of medieval manuscripts written in square notation using deep fully convolutional networks," *Applied Sciences*, vol. 9, no. 13, p. 2646, 2019.

[25] X. Zhang, "Music waveform analysis based on SOM neural network and big data," *Computational Intelligence and Neuroscience*, vol. 2021, Article ID 9714988, 11 pages, 2021.

[26] Q. Yang, "Cloud music teaching database based on opencl design and neural network," *Microprocessors and Microsystems*, vol. 82, Article ID 103897, 2021.

[27] J. Yang, "A novel music emotion recognition model using neural network technology," *Frontiers in Psychology*, vol. 12, 2021.

[28] A. M. Burns, "The kodály approach to teaching music," in *Using Technology with Elementary Music Approaches*, pp. 75–84, Oxford University Press, Oxford, UK, 2020.

[29] A. Andrea, P. Paoline, and A. Zahra, "Music note position recognition in optical music recognition using convolutional neural network," *International Journal of Arts and Technology*, vol. 13, no. 1, p. 1, 2021.

[30] X. Wang, Q. Wang, and Y. Chen, "Analysis of music online teaching curriculum arrangement based on BP neural network model," *Journal of Physics: Conference Series*, vol. 1648, no. 3, Article ID 032101, 2020.