Research Article

Research on Moral Education Function of Music Art in College Students Based on Bayesian Learning Algorithm

Meng Lu,1 Du Pengcheng,2 and Song Yanfeng3

1Harbin Normal University College of Music, Harbin 150080, China
2Institute of Magnetic Levitation and Electromagnetic Propulsion, Beijing 100043, China
3Harbin Normal University, College of Media, Harbin 150080, China

Correspondence should be addressed to Meng Lu; menglu002622@hrbnu.edu.cn

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1. Introduction

The strength of national strength in the twenty-first century is increasingly determined by the quality of a country’s citizens, and high-quality talents can only be realized through high-quality education and training. Cultivating students’ all-round development has always been an important aspect of education concern. While paying attention to students’ acquisition of knowledge, we should also pay attention to students’ ideological and moral education. Bayesian network is a probabilistic graphical model that was developed in the 1980s. Therefore, it is urgent to establish the correct outlook on life and values of the motherland in the future. Music is one of the main categories of aesthetic education, which not only plays a role in cultivating students’ talents and skills, but also has the function of moral education, so it has its special teaching position. It provides the means of knowledge representation, reasoning, and learning in uncertain environment. Based on Bayesian learning algorithm, this paper studies the moral education function of music art in college students. Bayesian network can effectively carry out multivariate joint prediction, causal reasoning, expression of uncertain knowledge, pattern recognition, image processing, and causal data mining. Among them, the method based on score search regards structural learning as a combinatorial optimization problem, and score function and search method are two important factors that affect the learning effect.

While paying attention to students’ acquisition of knowledge, we should also pay attention to students’ ideological and moral education. Bayesian network is a probabilistic graphical model that was developed in the 1980s. Therefore, it is urgent to establish the correct outlook on life and values of the motherland in the future. Music is one of the main categories of aesthetic education, which not only plays a role in cultivating students’ talents and skills, but also has the function of moral education, so it has its special teaching position. In the classroom of music teaching, teachers can better integrate moral education with teaching content through appropriate teaching forms so that students’ moral value can be embodied more concretely and the quality of music teaching in the whole junior middle school can be improved [5, 6].
With the advancement of modern computer technology, diagnosis, detection, communication technology, and other related disciplines, a comprehensive discipline integrating computer technology, diagnosis, information processing, communication technology, pattern recognition, and artificial intelligence has emerged, and the corresponding fault diagnosis technology has also advanced to the intelligent stage [7, 8]. In the 1980s, the Bayesian network was created as a probabilistic graphical model. In an uncertain context, it offers knowledge representation, reasoning, and learning tools. Decision making, diagnosis, prediction, and categorization are just some of the jobs it can do. It is extensively employed in a variety of applications, including data mining, voice recognition, industrial control, economic forecasting, and medical diagnostics. It has a strong theoretical foundation, a well-defined network structure, flexible reasoning abilities, an intelligent decision-making process, and an effective learning mechanism [2]. The Bayesian network, on the other hand, is a hot topic in scientific theory research. When Bayesian networks are used to the subject of defect diagnosis, there are still a number of theoretical and technological issues that need to be investigated further [9, 10]. The main aim of Bayesian network reasoning is to determine the edge probability distribution, which is the foundation for utilising it for decision making, diagnosis, classification, and prediction.

Bayesian network is the product of close combination of graph theory and probability theory [11, 12]. Learning the network structure of BN from data is a major challenge. Bayesian network can effectively carry out multivariate joint prediction, causal reasoning, expression of uncertain knowledge, pattern recognition, image processing, and causal data mining. Among them, the method based on score search regards structure learning as a combinatorial optimization problem, score function and search method are two important factors that affect the learning effect, and Bayesian network learning including structure learning and parameter learning is another factor that limits the practical application of Bayesian network [13, 14].

Theoretically, Bayesian networks can be constructed by domain experts. However, this will be extremely time-consuming, and it is generally difficult for experts’ experience and knowledge to be expressed systematically and accurately. Therefore, it is quite difficult to construct the network directly by domain experts in practical application. In modern times, with the development of database technology and the improvement of social informatization, people have accumulated a large amount of data, which inevitably contains a large amount of available information. Therefore, learning Bayesian network from data naturally becomes a good solution.

2. Related Work

Literature [15] puts forward that national music is a bright pearl in the Chinese history and culture. It plays a very important role in improving students’ ideological and moral quality and cultural and artistic cultivation. For example, the blind folk musician A Bing’s “two springs reflecting the moon,” Seiji Ozawa, the prince of Japanese music, once said with tears when appreciating: “this kind of music should be listened to on your knees. Anyone sitting or standing to listen to it is extremely disrespectful to the author.” I really knelt down. However, at present, some college students are keen on pop music, blindly “chasing stars”, and know nothing about ancient and modern excellent national music, which cannot be said to be a pity of music education in Colleges and universities! Literature [16] through the big data analysis method, “educating people is art in art, because people are the most complex and mysterious of all creatures.” He believes that the art of morality is first of all to let children receive good teaching, but also to carry out education and management with appropriate discipline and punishment. It can be seen that Comenius’ moral education covers a wide range. Through comprehensive knowledge education and practice, expand students’ knowledge so as to cultivate students’ innovative ability. Literature [17] studies show that some popular music, no matter from the content of words or the mood of music, inevitably has its vulgar side. If we do not pay attention to guidance, it is easy to mislead those college students who are not deeply involved in the world and have shallow experience, resulting in their disregard of beauty and ugliness and forming a bad world outlook, outlook on life and values. Literature [18] puts forward that music is an important form of expression of art. It can fully reflect people’s real emotion, express people’s emotion and life, and stimulate the emotional resonance of its listeners. Literature [19], through the big data analysis method, shows that most students have a certain sense of exclusion from theoretical teaching. Teachers should deeply interpret the content of music teaching through reasonable curriculum design, formulate scientific teaching objectives, and use the vividness of activities to carry out music teaching. Literature [20] shows that education is similar to all kinds of arts, with special emphasis on “practical practice,” hoping to carry out moral education through the teaching of art forms, such as music and painting. He believes: “The purpose of music education is to cultivate temperament and cultivate the mind, pictures show the modality of objects with lines and colors, music reflects people’s character with rhythm and melody, and music harmony and rhythm can cultivate character, encourage behavior and stimulate enthusiasm.” What Aristotle advocates is to feel the beauty of music through personal experience and gradually cultivate noble character by cultivating temperament. Literature [21] puts forward that music is an important expression of emotion. During the period of music teaching, teachers can take advantage of practical teaching and bring it into moral education in a timely manner through music activities so that students can not only better learn the knowledge of music, but also show their moral education ability more concretely. In literature [22], through the method of big data analysis, the emotional expression of music runs through his aesthetics from beginning to end. Different music can express different emotions, such as happy, sad, witty, and awesome, which can be expressed in different forms of music. In literature [23], according to research, using the moral education function of
music and art activities in higher vocational college students is beneficial in cultivating students’ feeling and promoting the sublimation of their ideological and spiritual realms. Literature [24] promotes the notion of using music education as the cornerstone of education and emphasizes the importance of music education in the educational area. “He thinks that music has the potential to educate people and to influence people’s thinking.” “To cleanse their hearts, young people must live in a lovely environment and grow their appreciation for beauty through listening to wonderful music pieces.”

This research investigates the moral education of music art among college students using a Bayesian learning method. Western philosophers, intellectuals, educators, and artists have had the same beliefs on school moral teaching from ancient Greece through the developing bourgeoisie and then to present times. They feel that moral education on college campuses should take into account the atmosphere of music art and adhere to human nature. To be able to oppose the presentation of moral education in the form of rote learning in the classroom, one must engage in a variety of learning and life experiences. Moral education is a social phenomenon as well as a social activity that aims to teach individuals how to be human in a way that is rich in beauty. Through rhythm, melody, and harmony, music may convey people’s emotional shifts. Music and moral teaching are inextricably linked.

3. Principle and Model of Bayesian Learning Algorithm

Bayesian network describes the causal relationship between variables, in which probability is used to express the certainty of this relationship. Bayesian network has flexible logical reasoning ability. In fact, the network reasoning gives the answer to the query question under any known conditions, and the reasoning is bidirectional—including prediction and diagnosis. Bayeux network has good understandability and logic. Bayesian network is a learning method that combines probability theory with directed acyclic graph, thus combining prior knowledge with probabilistic reasoning, and thus obtaining a reasoning mode that conforms to the law of human cognition. Bayesian learning algorithm is an effective scoring search method in network structure learning, but it requires a large sample set to ensure that the correct network structure can be obtained, and the logical order of input network nodes needs to be known. In practical application, it is difficult to obtain large-scale sample sets in most cases, and not every network can obtain a priori node order, so the application of Bayesian learning algorithm in engineering practice is limited. Bayesian network, also known as belief network or causal probability network, is a graphical model that combines probability theory and graph theory knowledge and can make probabilistic reasoning. It is a directed acyclic graph composed of variable nodes and conditional probability tables, which expresses the joint probability density distribution of a group of random variables. We use Bayesian network as a tool to evaluate the effectiveness of missile interception system and take it as an example to study and verify the performance of Bayesian learning algorithm proposed in this paper. The resultant Bayesian network is shown in Figure 1.

By comparing the random number generated by uniform distribution with the conditional probability of nodes, the sampling of nodes can be realized. Based on the given Bayesian network structure, a set of random sampling data can be generated by sampling nodes in turn according to the network structure order. Using the sample in MATLAB Bayesian network toolbox, BNET function can generate a small data set with scale n, and then use bootstrap method and probability density kernel estimation method to expand the data based on the data set, then use K2 algorithm to learn the structure, and finally compare. Bayesian learning algorithm uses probability density kernel estimation to expand the original data set and uses mutual information to confirm the node order, and then it carries out network learning with Bayesian learning algorithm music art in the moral education function of college students. This algorithm can give full play to the advantages of probability density kernel estimation in data set expansion. It provides relatively comprehensive and accurate sample data for the moral education function of later music art among college students. At the same time, the combination of mutual information confirmation node order and Bayesian learning algorithm can maximize the characteristics of high efficiency of independence test and fast and accurate Bayesian learning algorithm, making Bayesian learning algorithm get rid of the limitation of a priori input of node order. It is more practical in practical engineering problems. The P-MAP of probability model M is the ultimate aim of Bayesian network learning. Unfortunately, p-map is not available in all probability models. As a result, Bayesian network learning algorithms should attempt to express as much conditional independence as feasible while introducing as little conditional independence that does not present in M as possible. The idea of conditional independence extends across the whole Bayesian network theoretical study. It is made feasible by Bayesian network reasoning with conditional independence. In addition, a full graph does not compile any information from the standpoint of the programme.

The directed arc connecting nodes indicates the statistical association between variables in a Bayesian network, which is a graphical representation of a probability model. The conditional independence of variables is computed using a Bayesian network: any node x is conditionally independent of all nondescendent nodes after a specified parent node set Pa (x), which is recorded as 1 (X, NonDescent(X)|Pa (X)). A simple Bayesian network is shown in Figure 2.

Bayesian network is a theory that uses directed graph to describe probability relationship. It is suitable for uncertain and probabilistic things and is applied to related problems that conditionally depend on various control factors. Bayesian network contains some concepts in the knowledge of university probability theory in reasoning calculation.

The probability is calculated under certain conditions. If there are two events A and B, and P (b) ≠ 0, the conditional
probability of \( A \) under the condition of given \( B \) is recorded as \( P(A|B) \), which is defined as
\[
P(A|B) = \frac{P(AB)}{P(B)}.
\] (1)

Full probability formula, if all the factors affecting event \( A \) and \( B_1, B_2, \ldots, B_i \), satisfy \( B_i \cdot B_j = \Phi, (i, j) \), and \( \sum P(B_i) = 1, P(B_i) > 0, i = 1, 2, \ldots \), it is necessary.
\[
P(A) = \sum P(B_i) P(A|B_i).
\] (2)

Bayesian formula, also known as posterior probability formula and inverse probability formula, is widely used. Let the prior probability be \( P(B_i) \), and the new additional information obtained from the survey results is \( P(A_i|B_i) \), where \( l = 1,2, n, j = 1,2, \ldots, m \). Then, the posterior probability calculated by Bayesian formula is
\[
P(B_i|A_j) = \frac{P(B_i) P(A_j|B_i)}{\sum_{k=1}^{m} P(B_k) P(A_j|B_k)}.
\] (3)

The value of Bayesian network nodes depends on the value of its parent node set elements. For a Bayesian network with a certain order of node sets \( X=(x_1,x_2, \ldots, x_{m-1}) \), the network structure implies the following conditional independence assumption.

\[
p(x_1,x_2, \ldots, x_{m-1}) = p(x_i|\prod_{j=1}^{i-1} x_j), i = 1,2, \ldots, m.
\] (4)

The joint probability density distribution of \( x \) is expressed by \( P(X) \), which can be written as
\[
P(X) = \prod_{i=1}^{m} p(x_i|\prod_{j=1}^{i-1} x_j).
\] (5)

Bayesian scoring function can fully integrate the prior knowledge of nodes into the network structure, which is a measure of the joint distribution of nodes in the network structure. When the prior probability of the network structure is \( P(G) \), given the sample data set \( D \), the posterior probability of the network can be obtained as follows:
\[
P(G|D) = \frac{P(D|G)P(G)}{P(D)}.
\] (7)

The nodes, directed edges, and conditional probability table of Bayesian network express the joint probability distribution between variables concisely and intuitively. Its conditional independence ensures the direct and easy use of probabilistic reasoning. It is an effective tool to deal with uncertain problems. The process of Bayesian network structure learning is the decision-making process of
constantly looking for a network structure that fits better with the data set. It can be seen from the above formula that the space scale of Bayesian network structure learning increases with the increase of node number \( n \), and its structure learning has been proved to be a NP-hard problem. At present, there are two kinds of Bayesian network structure learning algorithms: the method based on conditional independence test and the method based on scoring search. Bayesian network is an information system, each edge is a noisy channel, and the node is an information control switch. If two nodes are related, there should be a path between them in the network, and when we know the state of one node, we can get the state information of the other node. When two nodes are independent, there is no path or the path is blocked between them in the network, and the state of the information switch is different from the specific path.

4. Research on the Function of Music in Moral Education of College Students

4.1. Moral Education of Music Art in College Students Based on Bayesian Learning Algorithm. Music is not simply an aesthetic talent, but it also has a strong technical component. The direct driving factor of moral conduct is music art based on Bayesian learning algorithms. Music is the most expressive expression of emotion among all art forms. It has the ability to express somber, ecstatic, exuberant, melancholic, and soft feelings. Music has the ability to communicate people’s feelings in the most direct, true, and profound ways. This may help students develop not only their skill and ability, but also their character and enhance their excellent personality and noble character. Music may also help pupils develop a positive mental attitude. When pupils sing or play music or dance in front of an audience onstage, they must conquer their fear and have enough bravery and confidence. Students’ creative development will be more explicitly highlighted, and their character and will be more nurtured by hosting dancing and singing contests. Teachers may also accompany pupils to nursing homes, engage them in a wide range of activities, and provide music and dancing to the old. They not only put the national policy of prioritising and caring for the elderly into effect, but they also infect students with actual activities in order to improve the moral character of college students. Similarly, students who speak onstage must have a high level of psychological quality in order to provide a decent performance. The majority of pupils feel excluded from theoretical instruction. Teachers in junior middle school should utilise acceptable curriculum design to fully comprehend the substance of music teaching, develop scientific teaching goals, and employ the vividness of activities to carry out music teaching. Music curricular practice takes the shape of musical expression forms including chorus, musical play, and music competitions. According to the division of range, rhythm, and harmony of melodies, teachers progressively infuse a cooperative spirit of students’ solidarity and mutual assistance to be more concretely displayed. When choosing the content of music textbook based on Bayesian learning algorithm, we must not neglect its ideological and educational nature, but choose positive thoughts, and try to give priority to melodies such as vigorous momentum or lightness. Through the integration of songs and moral education, not only can junior high school music teaching be more vivid, but also students’ comprehensive quality can be better displayed. The songs of Bayesian learning algorithm are rich in styles and themes. Through the display of melody and lyrics, students can deepen their thinking and experience the actual connotation brought by the author’s lyrics. From another point of view, it is also an effective guidance and education for the ideological and moral consciousness, moral behavior, emotional psychology, and values of the students who learn Bayesian algorithm, and it is of great significance to the formation and development of contemporary college students’ good moral literacy.

4.2. Experimental Results and Analysis. The purpose of the experiment is to compare the accuracy of \( x_2 \) distance learning algorithm, EM algorithm, and df-em algorithm with the algorithm in this paper. The experimental data are from the data samples generated by sophomore students’ music and art in moral education among college students. 200, 600, 1000, and 3000 are sampled, respectively. Under the same sampling data conditions, the four algorithms carry out parameter learning. The running accuracy and running time are compared. Here, the accuracy refers to the predicted correct number/total number of instances, as shown in Figure 3 and 4 and Figure 5.

The experimental results show that in small sample data, the accuracy of df-em algorithm is close to that of EM algorithm, and the accuracy of \( x_2 \) distance is relatively low. With the increase of the total number of samples, the
There are advantages of df-em algorithm. Although it is also close to EM algorithm, it is higher than that of EM algorithm. It reflects the running time of the three algorithms under the same accuracy. In the case of small samples, the running time of $Z_2$ distance algorithm is less than that of the other two algorithms. With the increase of samples, the running efficiency of df-em algorithm is higher than that of the other two algorithms. Overall, this algorithm is better than the other three algorithms. When choosing the content of music textbooks, we must not ignore its ideological and educational nature. We should choose ideas with positive and upward effects and try to focus on melodies such as magnificent momentum or relaxed and lively. Negative content or melody must not be selected into music teaching. In this way, when teaching students music, it can not only achieve the teaching purpose, but also make students relax their tension and happy mood. In order to encourage students to grasp music, life, truth, goodness, and beauty, and to learn to carry on great quality and good morals, the backstory of each piece of music must be adequately taught in the classroom.

The Asia Network, CarTrouble-Shooter network, and Bayesian network in the Bayesian network standard test set are utilised in the simulation experiment to validate the algorithm’s efficacy. To begin, two networks are sampled, each producing three samples, with the Asia Network obtaining data scales of 2000, 4000, and 6000. The CarTrouble-Shooter network samples data at scales of 600, 900, and 1200. The number of missing edges, the number of reverse edges, and the number of redundant edges are used to evaluate the experimental outcomes. The BN-Jaya method is compared to the HC and BNC-PSO algorithms, both of which are swarm intelligence optimization algorithms. Both BNC-PSO and BN-Jaya have a population size of 40 people and a maximum iteration times of 120. Each experiment was repeated ten times in a row before the average result was calculated. Figures 6 and 7 and Figure 8 demonstrate the experimental results of the three methods on the Asia Network and the CarTrouble-Shooter network.

The experimental findings demonstrate that the three algorithms can correctly learn the majority of the network’s directed edges, with just a few exceptions to the normal network topology. Under the same data size, the BN-Jaya method has the best learning impact, whereas the HC algorithm and the BNC-PSO algorithm have weak learning effects. This demonstrates the efficiency of the BN-Jaya algorithm. We must not overlook the ideological and instructional character of music textbook material while selecting it. Choose thoughts that have a good and uplifting influence, and attempt to concentrate on melodies like fantastic momentum or calm and vibrant. Negative content or melody should not be used in music instruction. As a result, while teaching pupils music, they may not only acquire the teaching goal, but also relieve their stress and be in a good mood. The foundation for efficiently employing Bayesian networks to address real issues is accurate and fast learning of Bayesian network structure and parameters. Bayesian network theory research is centred on it. It covers structure learning and parameter learning, as well as identifying the structure of a Bayesian network and the conditional probability distribution of learning node variables. Various media and network technologies have been better deployed as information technology has progressed. The selection of music resources via multiple channels may not only enhance the form of teaching, but also help students to have a greater interest in music education and to carry out music learning more methodically and moral education in order to make the teaching process more contagious.
Music is not only an artistic skill, but also contains rich technical spirit. Music art based on Bayesian learning algorithm is the direct driving force of moral behavior. At any time and under any circumstances, teachers in higher vocational colleges must maintain good ethics, love their profession, attach great importance to it ideologically, set an example, be a teacher by example, and correct their teaching attitude so as to correct students’ learning attitude and make them develop good work habits and rigorous and meticulous work style. This paper introduces a variety of reasoning analysis modes that Bayesian network can be applied to the moral education function of music art in college students, and based on the actual application of music art in the moral education function of college students, a small sample data set for evaluation is obtained through many reconnaissance experiments. Structure learning is the focus and foundation of Bayesian network learning. The songs of Bayesian learning algorithm are rich in styles and themes. Through the display of melody and lyrics, students can deepen their thinking and experience the actual connotation behind the author’s lyrics. From another point of view, it is also an effective guidance and education for the ideological and moral consciousness, moral behavior, emotional psychology, and values of the students who learn Bayesian algorithm, and it is of great significance to the formation and development of contemporary college students’ good moral literacy.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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