Application of Music Artificial Intelligence in Preschool Music Education

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Abstract. AI teaching is an important part of Internet + education and intelligent education, and also an inevitable trend of the times. Through the automatic language and language sense recognition processing technology, the robot can sense the life scene and voice emotion of infants, and automatically recognize and play functional music. Artificial intelligence develops rapidly and is widely used in various fields. Music robot with certain neural network can understand music, analyze music and create music. In the field of professional music education, all kinds of new interactive teaching music intelligent system based on music artificial intelligence technology will be a new mode of perceiving music, cognitive music, creating music and music education.

Keywords: Music Artificial Intelligence, Preschool Music Education, Various Fields

1. Introduction

Based on artificial intelligence technology, music artificial intelligence analyzes human music intelligence through big data, simulates the information process of human vision, listening, touch, feeling, thinking and reasoning, constructs its own neural network and algorithm generation, and finally applies it to human perception of music, cognition of music, research of music, creation of music, and creates a new music teaching mode of "human-computer interaction". Although the in-depth learning function of AI can not directly understand the connotation of music at present, it can fully understand the audience's preference for music through the in-depth learning of tag data [1]. At the same time, through speech content recognition and deep mining algorithm of non-standard data, precise management of music related interaction is realized. That is to say, for preschool children, their interaction with artificial intelligence can complete teaching tasks such as selecting songs, listening to songs, mapping of music corresponding courses, etc. At present, there are many artificial intelligence software and hardware for preschool music education in the education market. This paper discusses the realization principle and technical innovation direction of these products [2].

2. The Structure of A.I. technology for Preschool Music Teaching

In general, the entry-level preschool music teaching AI product realizes its hardware basic structure by the way of human robot hardware cooperating with the relatively professional music speaker, but for kindergarten teaching, the shape of the hardware is not important, but it should drive the multimedia equipment in the classroom, including projector, television, multi-channel speaker and its power amplifier [3].

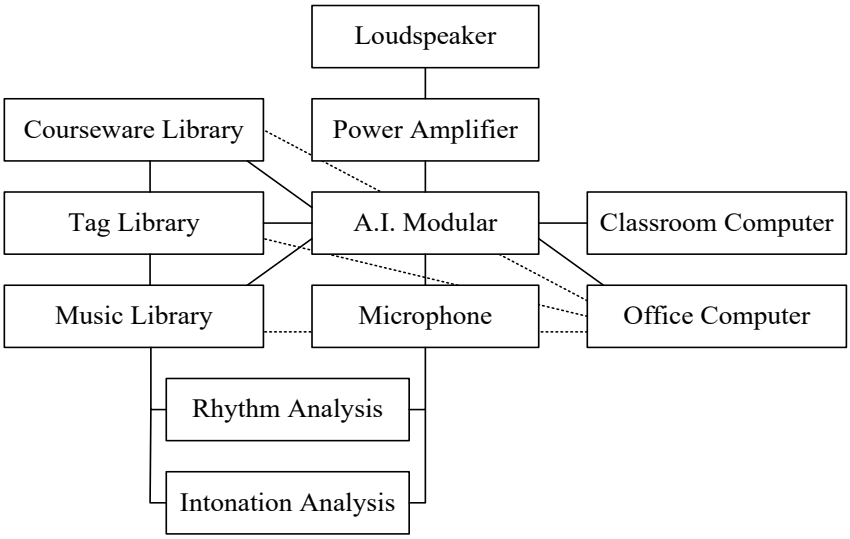

Figure 1. Schematic Diagram of Preschool Music Education AI System

With AI module as the core, the courseware library, music library and label library are directly connected. The courseware, music and labels related to music courseware in the library are managed manually by the teacher on the office computer. Meanwhile, the music library is directly connected with QQ music, shrimp music and other music libraries to realize API synchronization [4].

The AI module directly manages the microphone and power amplifier in the classroom. The microphone collects the voice interaction instructions in the classroom. The AI module recognizes the voice interaction instructions and links various operations. At the same time, the microphone collects the dry voice of students' singing, analyzes the rhythm and intonation, and gives the score. The power amplifier drives the speaker to play relevant music.

That is to say, the system can accept most of the voice instructions, directly analyze the score evaluation of students' singing, and achieve more in-depth interaction.

3. Preschool Music Teaching Supported by AI

At present, music education in primary and secondary schools in China mainly includes the following aspects: appreciation music, theoretical learning (basic music theory and Music History), skill performance (learning musical instrument performance, singing and chorus, band training). The current situation of teaching is that students like music, but it doesn't mean they like music lessons. In view of this common phenomenon, music teachers continue to innovate all kinds of new teaching models, such as increasing the use of multimedia teaching and modern network information technology; through the research and application of Orff, koday and dalcroz system teaching methods, to maximize the teaching participation of students. For the rapid development of artificial intelligence in the new era, the author puts forward the assumption that the construction and configuration of "3D Artificial Intelligence music classroom - music scene space in primary and secondary schools" will greatly improve students' interest and enthusiasm in learning music, and provide some exploration, research and thinking for the realization of new era, new concept and new technology teaching ideas.

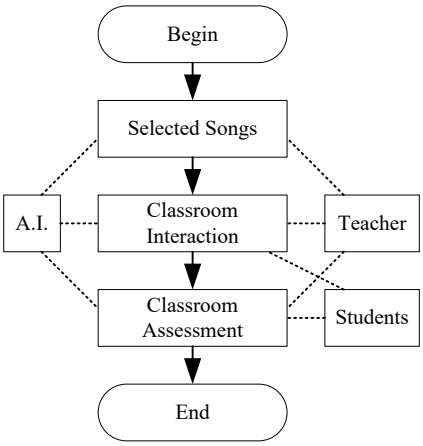

Figure 2. AI Driven Preschool Music Teaching Classroom Implementation Model

As shown in Figure 2, the song selection stage can be completed by the teacher independently or in the interaction between the teacher and the students, while many other classroom processes, including music interaction and music evaluation, can be completed in the interaction between the teacher and the students. AI system participates in the whole process of classroom interaction, but the interaction process is completed under the guidance of teachers and the main participation of students.

Although artificial intelligence technology has developed rapidly in the past five years, the understanding of AI deep learning technology to music still needs to be improved, so although AI technology can assist preschool music teaching, it is difficult to bear more complex teaching interaction. However, for preschool children, AI participation in classroom teaching is enough to bring novelty to students and fully stimulate students' interest in learning.

4. Application Prospect of AI Technology in Preschool Education

At present, the intelligent music interactive teaching platform is springing up, they based on big data analysis of customized personalized teaching. Teachers' online teaching, restore the offline one-to-one and one to many teaching scenes. Combined with the music recognition technology in the new music artificial intelligence technology, it makes the teaching interaction interesting, and can provide answers, scores and learning suggestions at any time, with high efficiency and low cost. So how to ensure the stability, safety, advancement and ease of use of the learning platform, as well as the accuracy, teaching rationality, sustainability and authority of the music professional knowledge in the platform, requires the long-term close cooperation between each professional music discipline group and the technology team. Under the guidance of postgraduate tutors in music and science and engineering, each student team can jointly apply for cross disciplinary research projects, which is conducive to the long-term sustainable research and development of this research.

At present, Google's magenta project seems to be more cutting-edge in science and technology. They don't agree with the Turing test of music artificial intelligence, and they don't want robots to create completely according to human thinking patterns and laws. Douglas Eck, a research and development scientist of the project, is also a musician. He tried to train nsynth's neural network to receive 300000 kinds of musical instrument sound training, so that its way of calculating, learning, generating and displaying new sound is different and has unique sound characteristics. Magenta project team hopes that music AI has its own relatively independent thinking and innovation ability. At present, the experimental works are not mature, but this may inspire the creative young music academic team to have a larger and freer imagination thinking space. Human beings need such a mind and tolerance. Scientific and technological innovation should have enough n-dimensional space for "flying in the sky". Maybe one day they can make sound effects and music that human beings have never heard before.

There are different opinions on whether artificial intelligence can replace human beings, but it is

certain that chess and go have been defeated by artificial intelligence. They can't replace human beings, but they are superior to human beings in many aspects. At present, robots can understand music, analyze music, create music and apply it to music teaching. With the continuous improvement of computer computing ability and the development and research of deep learning of robots in the context of big data, a new music ecosystem of music artificial intelligence + database + music teaching and application + social interaction will be an inevitable trend in the future.

5. Summary

AI teaching is an important part of Internet + education and intelligent education, and also an inevitable trend of the times. Through the automatic language and language sense recognition processing technology, the robot can sense the life scene and voice emotion of infants, and automatically recognize and play functional music. The robot is like a home music teacher, combining with children's living habits, accompanies daily life with specific pitch and rhythm, and gradually pays attention to basic music theory education. With music AI + Internet, the robot is like a huge music library. Traditional Internet search for music usually uses keywords. At present, AI can read the speech intention of children and parents through its own neural network, interact with human through voice and provide all kinds of music services needed.

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