



An Auxiliary System for Ideological and Political Teaching in Colleges and Universities Constructed Using Artificial Intelligence Algorithms

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Abstract:

For a long time, the ideological and political education in colleges and universities has been adopting traditional teaching methods. Traditional teaching methods cannot catch up with the new era of college students. In order to improve the quality of ideological and political education in colleges and universities, this paper applies artificial intelligence technology to all aspects of ideological and political education in colleges and universities. Ideological and political education can improve teaching efficiency, quantify teaching evaluation index and help teachers explore effective teaching methods through text recognition, speech recognition and emotion recognition technology. This paper discusses the application direction and specific application technology of artificial intelligence technology in ideological and political education, aiming to provide effective reference for ideological and political education in colleges and universities, so as to speed up the integration process of artificial intelligence technology and ideological and political education in colleges and universities.

Keywords: Artificial intelligence technology; ideological and political education; colleges and universities; behavior analysis

1 INTRODUCTION

Education plays an important role in talent training. In recent years, the continuous development of computer hardware technology and software technology has made the field of education constantly updated. In traditional teaching, the proportion of computer technology is not much. But in modern teaching methods, there are computer technology in every part of teaching. The development of artificial intelligence technology has led to the rapid development of a large number of technologies such as natural language recognition and generation, computer vision, and intelligent robots. These technologies can be used in the field of education. At present, there are also many colleges and universities trying to use intelligent products such as remote video whiteboards, virtual simulation experiment platforms, cloud teaching, and collaborative office developed based on artificial intelligence technology in practical teaching to improve the effectiveness of teaching. This paper focuses on the application of artificial intelligence technology in ideological and political education, and explores the specific application technology of artificial

intelligence technology in ideological and political course evaluation and students' cognitive recognition.

2 ARTIFICIAL INTELLIGENCE TECHNOLOGY

Artificial intelligence technology is an important subject in computer science, and it is also the most popular one. The goal of artificial intelligence technology development is to make machines as intelligent as humans, and to generate new skills through learning. Computer is an important means of realizing the development of artificial intelligence technology, and it is also the foundation of artificial intelligence. The most widely used directions in artificial intelligence today are intelligent decision-making, optimal path planning and intelligent computer systems [5]. Intelligent decision-making, also known as expert decision-making, can combine a large number of database samples to find out the basic laws and quickly obtain high-precision decisions. In the direction of optimal path planning, artificial intelligence technology can quickly find information with high matching degree. Artificial

intelligence technology can use the data information storage path as a basis, use a large amount of data to quickly compare various paths, and finally get the best path. The main direction of intelligent computers is automaton simulation [6]. Today, a large number of scientific research teams are trying to make intelligent computers have their own thoughts and have unique behaviors in line with human thinking. Intelligent computer is the ultimate direction of artificial intelligence technology, which involves not only artificial intelligence technology, but also various disciplines such as philosophy, social science, economics, and history [11].

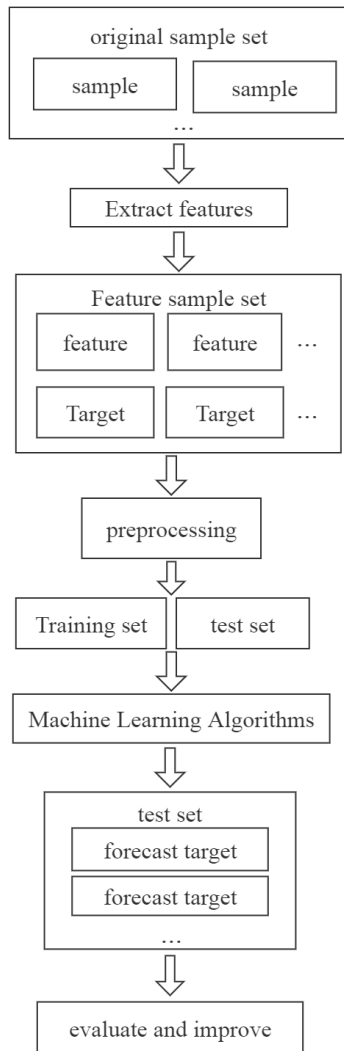


Figure 1: Machine Learning Algorithms

This article focuses on machine learning algorithms. A machine learning algorithm is an implementation of artificial intelligence. Machine learning can give machines the ability to learn, and the machine will continue to upgrade itself in the process of learning, and eventually achieve functions that directly become impossible to complete. The core of machine learning is training models. In the process of learning, the machine

will summarize a model based on a large amount of data, and then predict the next data according to the model [4].

3 APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN IDEOLOGICAL AND POLITICAL EDUCATION

In order to make up for the shortcomings of traditional ideological and political teaching, this paper proposes a teaching evaluation system that can be used in ideological and political classrooms. This system uses artificial intelligence technology as a technical support, uses classroom real-time monitoring to analyze students' classroom performance, and combines teachers' teaching content to finally form teachers' teaching evaluation.

The ideological and political course evaluation system based on artificial intelligence technology needs to have a complete hardware architecture, including computers, cameras, audio collection equipment, data analysis servers, etc [2].

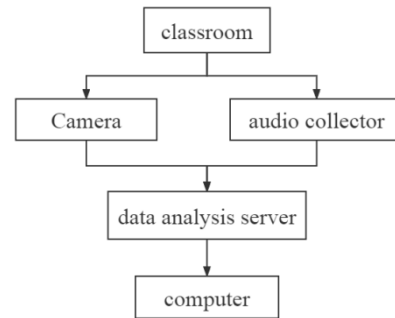


Figure 2: System Hardware Architecture

Computers are placed in the classroom. The computer needs to be pre-installed with a software system that can record and analyze the content of the teacher's lectures. The software system has functional modules such as video analysis, speech analysis, speech emotion analysis, and courseware content analysis. The function realization of the module mainly depends on artificial intelligence technology [10].

Video capture equipment and audio capture equipment are mainly responsible for collecting data information. These devices are generally installed near the podium in the classroom, and can shoot and record the teacher's panorama [3]. Audio collection equipment is generally divided into voice collection equipment and noise collection equipment. Noise collection devices can collect noise from the environment. Environmental noise is also one of the important criteria for evaluating teachers' teaching level.

The data acquisition device will send the collected audio and video to the computer, and the computer will send it to the data analysis server. The server will process the data, integrate and analyze the information data

collected in the video, and finally form a diversified evaluation form. After the data analysis server sends the final data processing results to the computer, colleges and teachers can view the teachers' teaching scores automatically evaluated by the computer [9].

The system analyzes the students' listening behavior, mainly using the deep learning theory in artificial intelligence technology. Deep learning theory can identify human behavior characteristics. The system can construct deep belief networks using restricted Boltzmann machines, extract higher-order features in video images using high-dimensional convolutional neural networks, and simulate neuronal responses using independent subspace analysis. These scientific and technological proposals have important significance for the construction of this system [1].

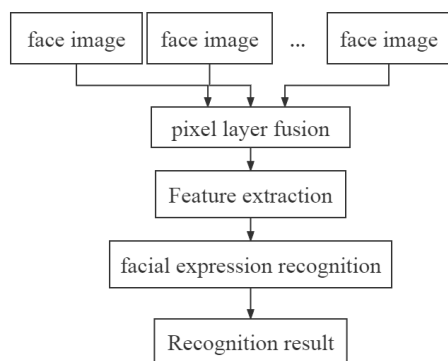


Figure 3: Facial Feature Recognition Process

The system will focus on the analysis of the teacher's teaching content. In the 1990s, IBM introduced speech recognition software that supported Mandarin recognition. With the continuous development of information technology, the functions of software are becoming more and more powerful. The development of current recurrent neural network technology enables software to recognize speech more accurately and efficiently [8]. After the audio collection device collects the audio of the classroom, the system will use the speech recognition technology to collect the speech information of the teacher. For audio, the system first performs noise reduction filtering, and then converts it into textual information. The word frequency statistics and clustering short hair in the system will count the frequency of high-frequency words and professional words that appear in the classroom. The frequency of these words is also a criterion for evaluating teachers' teaching level.

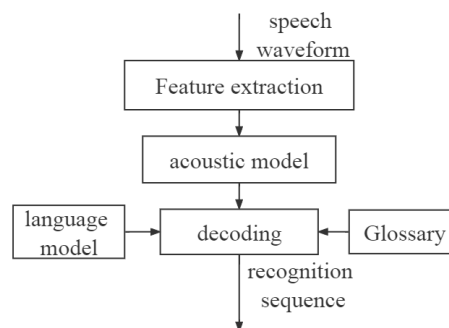


Figure 4: Speech recognition technology process

4 FACE RECOGNITION ALGORITHMS

In order to realize the face recognition function in the system, this study uses face detection technology to calculate the students' facial expressions and attendance in the classroom. Due to the large number of people in the classroom, the pictures captured by the camera should be cut first. This study uses the semi-overlap principle to cut the image along the long edges. The system first cuts the image into three sub-images, and then performs face detection [7].

The face detection algorithm using recursive image segmentation is as follows:

```

listface_set=NULL;
intdeep=0;
voidface_detection (image){
face_list=opencv_detection (image);
// face detection using opencv
deep_repeat (face_list, face_set);
// face set deduplication
If (deep<N) {
deep++;
or (i=0; i<3; i++) {
child=split (image, i) ;// Image segmentation
face_detection (child);// Detect sub-image faces

```

The algorithm uses the CascadeClassifier classifier from the OpenCV library to detect faces in the current node image. The algorithm then organizes and collects the detected faces, and deletes the duplicate faces. Finally, the algorithm processes each sub-image until the image is segmented and the set image segmentation depth is reached.

In order to test the recall rate of this algorithm, this study tested this algorithm and performed statistical analysis on the test results.

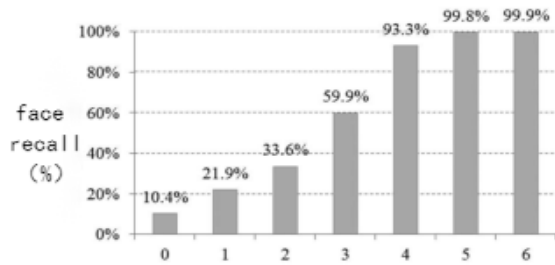


Figure 5: Face recall with different image cutting depths

As can be seen from the figure, the greater the image cutting depth, the higher the recall rate of people. Especially when the image cutting depth is 4, the face recall rate is more than 50% higher than that when the image cutting depth is 3. In order to meet the needs of this system, the image cutting depth set by the system can be 4 or 3.

5 CONCLUSION

Ideological and political education is the most important part of higher education. An excellent ideological and political education can enable students to establish a correct outlook on the world and the values of outlook on life. In order to improve the efficiency and quality of ideological and political education, colleges and universities should try to apply artificial intelligence technology to ideological and political classrooms. This paper proposes an ideological and political classroom quality evaluation system based on artificial intelligence system. This system can evaluate the teaching level of teachers based on the recognition of students' facial features and the recognition of teachers' speech. This system has important practical value for improving the teaching level of teachers.

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