Personal Portrait Modeling of Intelligent Campus Students in Higher Vocational Colleges Based on Data Mining Algorithm

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Abstract: With the continuous development of information processing technology in modern society, the construction of intelligent campus has become an inevitable trend. As a new teaching mode, intelligent education is attracting more and more scholars and researchers' attention. The purpose of this paper is to study the modeling of personal portrait of students in intelligent campus of higher vocational colleges based on data mining algorithm. First of all, this paper introduces the characteristics of students' personal portraits, and expounds the factors that affect students' personal portraits. Then, the association rule algorithm is studied, and based on this algorithm, the personal portrait model of students in the intelligent campus of higher vocational colleges is designed. Finally, the function of the model is verified by simulation experiments. The test results show that the intelligent campus portrait model based on data mining algorithm has the characteristics of short data processing time, low delay time, high safety factor, and is compatible with the platform, indicating that the model functions well.

Keywords: Data Mining Algorithm, Smart Campus, Higher Vocational Students, Personal Portrait

1   INTRODUCTION

The construction of smart campus is an inevitable topic in the growth of higher education in China. The benefits it brings directly affect the teaching quality of colleges and universities. Therefore, the construction of a scientific, reasonable, efficient and practical personal portrait of vocational college students can fully reflect its value and significance. With the wide recognition and promotion of the concept of smart city in the country and the continuous deepening of education reform under the strong support and promotion of relevant national policies, the "Internet +" thinking concept is gradually integrated into various industries and fields, changing people's life style and work mode[1].

Many scholars have conducted relevant research on smart campus. Overseas smart city construction started earlier, has formed a relatively complete and mature system, and has made great achievements in theoretical research. After reading a large number of documents on the subject of "personal portrait of Higher Vocational Students" in China, it is found that many scholars have made corresponding articles on this issue. For example, some scholars use data mining algorithms to build a kind of model including basic knowledge, which is formed based

on the experience of different disciplines and fields and has special significance and universal applicability, and put forward specific application strategies[2]. Some scholars take the "personal portrait of Higher Vocational Students" as the goal. In order to enable more students to have a better learning environment and conditions to adapt to the growth trend of this change and demand and improve their teaching quality, they have taken measures to carry out intelligent management and improve learning efficiency. In addition, with the construction of smart campus as the background, a network structure model of education system based on cloud computing technology is also constructed with the goal of realizing resource sharing and maximizing utilization value through the establishment of big data platform[4]. Therefore, based on the data mining algorithm, this paper studies the modeling of students' personal portraits in the intelligent campus of HVC[3].

With the expansion of the scale of colleges and universities, the number of students has increased dramatically. There are many potential values in the huge, complex, uncertain and large amount of data. The construction of smart campus is the general trend of the reform and growth of higher education in China. Based on this background, this paper takes HVC as the research object to carry out an in-depth analysis of the intelligent teaching mode and propose corresponding solutions, aiming to improve the efficiency of intelligent information retrieval and enhance the ability of students' personal portrait generation to meet the growing needs of the modern information society, realize the strategic objectives of "teaching students according to their aptitude", improve the quality of talent training and innovation oriented country, and provide reference for relevant departments[5].

2 DISCUSSION ON PERSONAL PORTRAIT MODELING OF INTELLIGENT CAMPUS STUDENTS IN HVC BASED ON DATA MINING ALGORITHM

2.1 Characteristics of Personal Portraits of Campus Students

The construction of smart campus is to take students as the center, take the concept of "people-oriented" as the guide, organically combine Internet of things technology with information technology, integrate ideological and political education theory courses and modern information technology professional technology, make full use of information in teaching, and comprehensively improve through practical teaching, excellent lectures and other forms. In this process, we should not only pay attention to the stimulation of students' interest in learning basic knowledge, but also pay attention to the growth of students' personality. Smart applications are developed based on the new generation of processing and analysis modes such as cloud computing and mobile communications. Through learning and training data mining algorithms, knowledge sharing and collaborative cooperation can be realized. At the same time, personalized learning plans can be designed according to different needs and a variety of service items can be provided for students to choose and use to meet the requirements of mutual communication and cooperation between different students. Due to the different living environment, growth experience and education concept of each person, there are certain differences, and there are also a large degree of plasticity and similarity between individuals. Therefore, the evaluation of the same object often has its own distinctive and unified judgment basis and thinking mode and method of standard answers or opinions, which

makes the personal portraits of students in smart colleges more rich and diverse, and can reflect the personalized characteristics in the process of data processing. Smart campus involves many disciplines and majors, and students' personal information, learning and employment will have a great impact. Therefore, the integrity of these data needs to be taken as the basic work when data mining and processing. At the same time, comprehensive analysis and research should be carried out for each student to understand their potential demand change laws and psychological characteristics, and adjust the target direction and content according to the actual needs to cope with the constantly updated knowledge structure[6].

2.2 Main Factors Affecting College Students' Personal Portraits

(1) Learning environment. As the construction of smart campus is completed in the university campus, it has a subtle effect on students' learning styles and behavior habits. First of all, we should look at all the curriculum settings and the self-growth of college students in the intelligent college from the objective conditions. Secondly, a large number of training contents related to professional skills, knowledge, practical experience and psychological quality are involved in the teaching process. Finally, these factors will affect the teachers' Mastery of students' personal information to varying degrees[7].

(2) Quality of personal information. In the process of learning, students will be involved in a variety of professional related knowledge and skills accumulated, left or left over from different disciplines and do not need to acquire knowledge and skills through eyesight memory. These data can be used as an important reference. Therefore, it is necessary for college students to identify their basic personal information and other hidden factors, which are crucial to the construction of smart campus. First, they should fully understand their interests and hobbies. Second, they should know what can be useful[8].

(3) Personality characteristics. In the traditional examination oriented education mode, teachers blindly pursue high scores, and take the test results as the evaluation standard. The background of smart campus construction requires teachers to improve their own quality and teaching level in many ways to cultivate good learning habits and comprehensive qualities of college students. In addition, students need to enhance their personal information security awareness to ensure the safety, integrity and accuracy of the data collection process.

2.3 Data Mining Algorithm

The concept of data mining algorithm is proposed based on statistical learning theory. Its main purpose is to reveal the potential value hidden in information, and then help people better understand and use useful information. Cluster analysis is the process of dividing a large number of new things into several categories with the same characteristics or similarities according to a certain standard or attribute, and different categories can be classified with similar properties relative to other individuals, and these specific objects are classified into a group. Data mining algorithm is a cross and integration technology based on statistics, mathematics and other disciplines through the training of potential regularity in data sets. Its purpose is to find and process a large number of patterns or regular features, and extract and classify these valuable information. In modern society, computer network has become an indispensable part of human life. With the advent of the Internet era and the increasing number of mobile terminal products such as notebook computers and mobile phones, and the

continuous improvement of the degree of intelligence, people have become more dependent on data mining algorithms[9]. At the same time, the growth of cloud computing, big data and Internet of things technology has also provided good conditions for a large number of information resources. In the transaction data set D, there are itemset X and itemset y, then the ratio of the number of transactions containing X and Y in D to the number of transactions containing x in D is the confidence of rule x $\Rightarrow$ y, and also the ratio of the support of itemset X Y to the support of itemset x, which is recorded as confidence (x $\Rightarrow$ y). This reflects the conditional probability of occurrence of Y in transaction X:

$$\text{Confidence}(X \Rightarrow Y) = \frac{\text{Support}(X \cup Y)}{\text{Support}(X)} \tag{1}$$

The support of rule x = > y in database d is the ratio of the number of transactions in the transaction set containing both X and y to the number of all transactions, which is recorded as:

$$\text{Support}(X \Rightarrow Y) = \sup \text{port}(X \cup Y) \tag{2}$$

The relevance of the transaction depends on the support of the rules. The security of the transaction is measured by the confidence. These two values reflect the availability and confidence of the rules. The possibility of rule occurrence is actually measured by the level of support and the level of trust. The thresholds of mining support (min.sup) and minimum confidence (min, _conf) should be defined by association rules, usually business requirements or mining experts. The support and confidence below these two thresholds are not the key to generating association rules after data mining.

3 THE EXPERIMENTAL PROCESS OF PERSONAL PORTRAIT MODELING OF INTELLIGENT CAMPUS STUDENTS IN HVC BASED ON DATA MINING ALGORITHM

3.1 Modeling of Personal Portraits of Students in Intelligent Campus of Higher Vocational Education
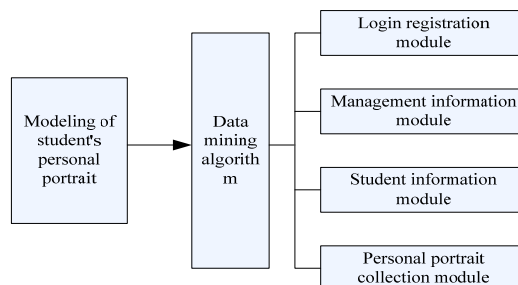

Figure1. Personal portrait modeling

The construction of smart city based on data mining is a systematic project. The system includes the personal information management, learning analysis and evaluation mechanism of college students. By constructing an efficient intelligent portrait framework system (as shown in Figure 1) containing multiple model parameter variables, the modeling process from complex to simple can be realized. First of all, it is necessary to conduct research on the current research results in relevant fields at home and abroad before clearly proposing this research topic. Secondly, according to these requirements, corresponding modules are designed and data mining application scenario library and preprocessing toolbox are established, which are divided into four parts: student information module, login registration module, management information module and personal portrait collection module. The construction of smart city based on data mining is presented to people in a variety of ways such as massive and complex texts, images and sounds under the background of information explosion. In order to effectively manage a large number of documents, it is necessary to process various types of original data. Firstly, the subject of classified user portraits is obtained through literature search and its categories are sorted out. According to different identities, the content groups containing the same functions or keywords on the personal characteristic variables of students and different professional attribute dimensions are analyzed. Secondly, the role of college teachers is mapped to a group similar to College students for modeling, and the corresponding results are finally obtained[10].

3.2   Functional Module Test of Personal Portrait Model of Students in Higher Vocational Intelligent Campus

The system function module test mainly includes three sub modules: data preprocessing, problem output control and user authority setting. By collecting and sorting the contents of students' learning process and classifying them, it provides a basis for the future teaching reform of HVC. At the same time, some information that is not convenient for later maintenance or modification should be deleted or changed in time. For a large number of redundant text and formatted files, the data storage function and statistical analysis function can be realized by manually inputting and automatically generating corresponding tables. Establish a complete and strict logical framework system for these three major directions. This framework includes the algorithms used in the analysis and processing of students' personal characteristics. Secondly, there are detailed descriptions for each small detail, and a corresponding relationship table is given to describe its relevant contents. Finally, after these are introduced in detail, specific tests can be carried out[11].

4   EXPERIMENTAL ANALYSIS OF PERSONAL PORTRAIT MODELING OF INTELLIGENT CAMPUS STUDENTS IN HVC BASED ON DATA MINING ALGORITHM

4.1   Test and Analysis of Functional Modules of Personal Portrait Model of Students in Higher Vocational Intelligent Campus

Table 1 is the test data of the function module of the student's personal portrait model.

Table1. Functional module testing

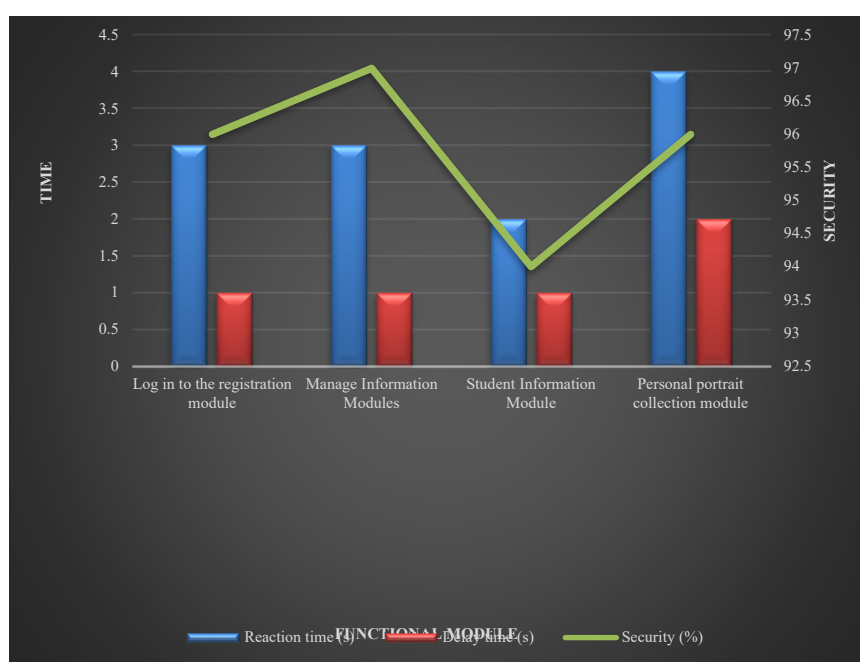| Functional module	Reaction time (s)	Delay time (s)	Is it compatible with the platform	Security (%)
Log in to the registration module	3	1	YES	96
Manage Information Modules	3	1	YES	97
Student Information Module	2	1	YES	94
Personal portrait collection module	4	2	YES	96

Figure2. Functional test of the personal portrait model

The system test mainly includes two aspects, one is to preprocess the data set, and the other is to extract the matching association rule attributes from the classification information. First, we use artificial language to screen and train the content of the students' personal portraits that meet the requirements. Secondly, we use students of different categories and genders to mine similar characteristics and different styles with the same characteristics or preference types from other dimensions, and can represent the subject type, class environment and subject characteristics of the whole text object, Then these data sets are preprocessed and imported into the system for modeling. It can be seen from Figure 2 that the intelligent campus personal portrait model based on data mining algorithm has short data processing time, low delay time, high safety factor and is compatible with the platform, which indicates that the function of the model operates well[12].

5   CONCLUSION

With the further deepening of the intelligent construction, the personality of students is constantly changing. At the same time, due to the differences and weak pertinence in the educational mode and teaching content of HVC, the needs of different individuals in the same class are converging to a large extent. Based on these problems, this paper will take higher vocational schools as an example to establish a set of intelligent student portrait modeling management platform that conforms to the characteristics of the major and has good adaptability, can provide a good learning environment for students and rich campus cultural life experience.

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