Hindawi
Wireless Communications and Mobile Computing
Volume 2023, Article ID 9793847, 1 page
https://doi.org/10.1155/2023/9793847

Retraction

Retracted: Design and Application of College Student Management System Based on Big Data Technology

Wireless Communications and Mobile Computing

Received 26 September 2023; Accepted 26 September 2023; Published 27 September 2023

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] S. He and Y. Li, "Design and Application of College Student Management System Based on Big Data Technology," *Wireless Communications and Mobile Computing*, vol. 2023, Article ID 5752949, 11 pages, 2023.

Hindawi
Wireless Communications and Mobile Computing
Volume 2023, Article ID 5752949, 11 pages
https://doi.org/10.1155/2023/5752949

Research Article

Design and Application of College Student Management System Based on Big Data Technology

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Received 8 August 2022; Revised 13 September 2022; Accepted 20 September 2022; Published 6 February 2023

Academic Editor: Kuruva Lakshmanna

In order to effectively manage the employment information of colleges and universities and improve the employment ratio of college graduates, the employment information management system of colleges and universities under the big data environment is designed. The graduate management platform in the system is used for graduates to edit personal information, understand employment-related information, and check recruitment information. The enterprise information management platform is used for enterprises to edit their own materials and publish recruitment information, so as to find graduates meeting the job requirements. The personalized recommendation platform uses the recommendation method based on users' historical information to achieve offline employment recommendation and uses the recommendation method based on real-time user behavior data to achieve online real-time employment recommendation and improve the employment ratio. The employment information tracking management platform is responsible for recording graduates' employment information and verifying the authenticity of recruitment information. The experimental results show that the system has a fast response time and low resource occupancy rate when the number of concurrent users is different. The employment rate of college graduates is effectively increased.

1. Introduction

At present, employment websites based on the application of Internet technology have become an important tool for graduates to seek employment. Compared with traditional job-seeking methods, online employment has the advantages of high efficiency, convenience, and low cost but also has shortcomings such as low success rate and high information risk [1]. The main reasons are as follows: First, the job information provided by many companies is inaccurate or even false. Second, job seekers are not familiar with the system and do not know how to choose positions that meet their skills and expertise. Third, the job-hunting system is vague in the description of the information provided and cannot precisely locate [2]. Under normal circumstances, people usually focus on distance issues, transportation convenience issues, salary levels, working hours, and intensity when making employment choices. However, the existing employment recommendation or online job search systems lack intelligence and can only provide users with recommended information based on simple classification technology and cannot fully take into account the employment information that users are concerned about, resulting in inaccurate information matching, which affects the success rate of online job hunting and wastes resources [3], because most systems still use the traditional database system model. However, a wealth of data shows that traditional databases have many obvious shortcomings.

Overall, the defects and deficiencies of the existing graduate employment management system mainly include the following aspects. First, the service target is not comprehensive enough. Most of the existing employment management systems for college graduates are independently developed and operated by the school, and the purpose is only to develop and provide an online employment platform for

school graduates according to their own needs [4]. Second, there are differences in the main functions. One type of system takes student file management as the main function, and the other type is used as an employment platform. Similar to the trading platform, its main function is to publish and obtain information. Third, the overall employability evaluation of graduates is insufficient. Fourth, the participants are different. In the traditional employment model, the head teacher communicates the information about talents and job requirements collected by the employment department to the students in the class and then arranges interested students to conduct centralized two-way recruitment interviews. Head teachers and students are the main body of traditional employment management. Fifth, there are different degrees of openness [5]. The security and reliability of user privacy data protection are poor. Usually, when storing information, users will choose the form of plaintext storage, which has a greater risk of information and data security. Except for a small number of systems that open websites through search engines, most college graduate employment websites are not open to the outside world, only limited to the graduates of the school to query recruitment information and submit resume information to interested companies or positions. It is precisely because of such problems and deficiencies in the employment information system of traditional college graduates that the central government of our country has made clear regulations for graduates of vocational colleges to find jobs, requiring the use of graduate colleges as an employment information channel.This method can effectively transmit information between industries and regions and build a complete recruitment system for employers [6]. In addition, it is necessary to do a good job of feedback, improve the current education system, fully mobilize the enthusiasm of educators, and promote the healthy development of higher education.

The low degree of informatization is the main factor affecting the scientific development of the graduate employment management system, which directly leads to the limited information exchange between graduates and recruiting units. The old system is no longer suitable for the employment information management of college graduates in the new era. In order to adapt to the development of the times and broaden the employment channels for students, the purpose of research and development of this system can be summarized as the following aspects. First of all, based on the trend of modern informatization development, we design and develop a powerful and systematic employment management information system, so as to make positive contributions to the informatization development of employment management in colleges and universities. Secondly, it is to establish a relatively complete employment management system for college graduates to improve the work efficiency of employment-related work. Finally, on the basis of the full application of the graduate employment management information system, the efficiency, timeliness, and scientificity of employment information management in colleges and universities can be effectively improved, and the management level of managers can be improved at the same time [7, 8]. If the accuracy of the result is equal to or greater than the preset threshold, it means that the decision tree model has passed the test and can be used as a tool to complete the analysis of actual data.

Data clustering algorithms are often used in data mining to divide intractable information and seek regular and helpful information for solving problems. Data clustering algorithms are mainly derived from the basic theory of information theory and use information gain to measure the type of data in the decision to determine the node. The ultimate goal of system design is based on modern data mining technology and knowledge discovery technology, to design and develop an efficient, stable, system-perfect, technologically advanced, safe, and reliable college employment management information system. After the completion of the system, the college can make a systematic and comprehensive analysis of the employment situation of graduates in a timely, accurate, and comprehensive manner; build a platform for the "two-way selection" of employers and graduates; and place the finishing touch to the college, graduates, and employers.

In recent years, in order to improve the quality of employment services, expand students' employment ideas, and broaden students' employment channels, colleges and universities have invested a lot of energy. However, due to various reasons such as establishment and funding, employment work is still difficult. The breakthrough to solve this problem is to use data mining and network. It can provide sufficient scientific basis for the high school to formulate various work plans such as employment, teaching, and scientific research [9]. The system can not only quickly and effectively collect graduates' employment intentions, employment information, occupational price views, etc., but also collect and analyze the employment needs of employers. Through the effective analysis of the data in the background database of the system, it can provide auxiliary guidance for the decision-making of the school employment management department and promote the development of future work in a purposeful and targeted manner [10]. It is of great significance to improve the total employment rate and formal employment rate of college graduates.

2. The Analysis of Functional Requirements

Generally speaking, the design of the system should meet the needs of the external environment of the system. Judging from the current external users of the system (schools, employers, and graduates) and the purpose of system development, the system is mainly for the convenience of graduates to receive information, employers to release information, and schools as a third party to facilitate management and at the same time for the use of the three parties to provide good technical support [11]. At the same time, taking into account the possible needs of future development and upgrading, as well as the convenience of system operation and maintenance management and the completeness of functions, the system should have scalability, based on the creation of typical users to describe user needs for different goals. And according to the approximate relationship between goals and needs, similar users are classified into the same user group, and then based on the common characteristics of the user group, their needs

are analyzed to determine the goal of system development [12]. As mentioned above, the current external users of the system are employers, graduates, and schools. For employers, they have a better understanding of the talents they need. For schools, it has a certain guiding role in the training direction of students.

2.1. Employer. As one of the key links of employment relationship, employers must show their own information and resources to schools and graduates as much as possible when recruiting talents, which could achieve the effect of attracting talents. The needs of employers are relative to graduates. Basic management functions such as user registration, login, information query, information release, and information reception can be completed in the system [13]. The graduate employment information management system is based on the purpose of "serving graduates and facilitating employers." And it is an information platform that integrates graduate employment management, business processing, graduate job search and job selection, and employer recruitment of talents. After the employer registers and opens an account in the employment information management system, it can publish recruitment, search for students, view the resumes submitted by students, and send interview notices to students. And it can send contract invitations to prospective graduates to sign contracts and labor contracts online with students and go through the procedures for receiving graduates. After logging in, the employer can also modify part of the registration information and modify the login password and other operations. Firstly, recruitment information is released. After the employer logs in to the special area, they fill in the recruitment demand information in the "Publish Recruitment Information" column. Graduates can search for the recruitment information released by the unit after logging in. Secondly, resumes are received. After the employer publishes the recruitment requirements, graduates can retrieve the recruitment information of the unit and then send their resumes to the employer. Employers can check the resume information sent by all graduates in the "Receipt Received" column. For interested graduates, you can put it in your favorites for future use [14]. Third, the employment certificate is sent. If the company does not sign an online agreement with the graduates, but has an employment relationship with the graduates, it can "send employment certificates" to the graduates in the "Signing Invitation" column. After the graduates make an appointment, the employment certificate is automatically generated online and can be printed.

2.2. Graduate. As an important subject in the employment management system, graduates occupy a very core position. The main function of the employment management system is to provide a platform for graduates and employers. Both parties can publish and match relevant information in the new information system to clarify the supply and demand intentions of both parties, so as to provide graduates with sufficient employment options, through an adequate two-way choice to achieve their employment goals [15]. Similarly, the system use rights of graduates are divided into functions such as user registration and login, modification and viewing of their employment information, posting job search information, related job search, and inquiring about employer information. After the graduates and the employer have reached a contractual intention, the employer will issue a contractual invitation to the graduates. After the graduates browse the received contract invitation and additional terms and conditions, if they agree, they will accept the contract; otherwise, they will refuse to accept the contract. After the two parties sign the contract, an employment agreement will be automatically formed, and the information will be transferred to the school for review and archiving [16].

2.3. School. School is a transition period for students from learning to practice, which is of great significance to student employment and employer recruitment. For students, the school has two roles. First, it provides employment guidance and career planning for students. Second, it builds a bridge between recruiting companies and students and displays employment information and job demand information to graduates. In the process of information exchange, schools need to play the functions of supervision, statistics, and guidance. In the information management system, schools need to have specific management functions such as basic information management, user registration, login, employment agreement management, and recruitment unit management, so as to ensure the reliability and accuracy of information and achieve its stable operation [17].

3. The Design of University Employment Information Management System Based on Big Data Platform

3.1. The Overall Structure of the System. Data preprocessing mainly includes data integration and data transformation. The data of a graduate's basic information and employment information come from different databases, so it is necessary to integrate the two databases first. The university employment information management system based on the big data platform includes four subsystems: graduate information management platform, enterprise information management platform, personalized recommendation platform, and employment information tracking management platform. The method of generating a classifier from a dataset is different from that of a generator. After the generator is created, it classifies the data with unclear label attributes and analyzes the clear label attributes through the classifier to provide a basis for relevant predictions. The functional modules of the university employment information management system based on the big data platform are shown in Figure 1.

The ultimate goal of system design is based on modern data mining technology and knowledge discovery technology, to design and develop an efficient, stable, system-perfect, technologically advanced, safe, and reliable college employment management information system. The graduate management platform includes four functional modules: personal information management, employment information management, job search management, and personal information dimension. The employment information management module means that graduates can view the latest employment news and employment guidance provided by system administrators

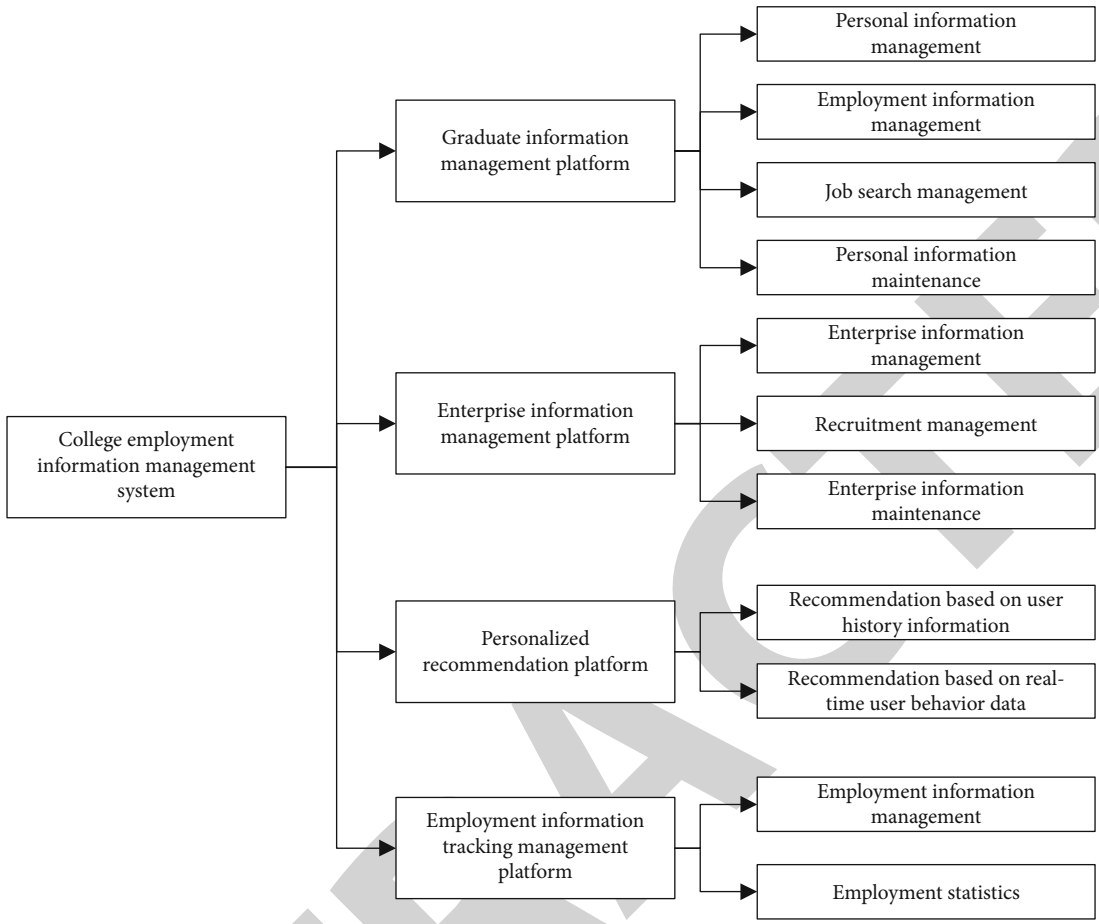

Figure 1: Functional modules of the employment information management system for college students.

and fully understand employment-related information [18]. As the most basic principle of system design, practicality will directly determine the success of the system. Whether the system can achieve the expected goals and meet the needs of users is an important indicator for evaluating and analyzing its performance level. The job-seeking management module provides graduates with recruitment information released by enterprises. Graduates can view relevant information of enterprises in the system by searching for keywords and realize employment exchanges by leaving messages. The personal information maintenance module is responsible for providing graduates with the service of modifying personal passwords. The main component of the training set is the database. Each piece of information in the database is a collection of related information. These collections are collectively called attributes, and attributes can classify the data in the database.

The enterprise information management platform includes three functional modules: enterprise information management module, recruitment management module, and enterprise information maintenance module. Among them, the enterprise information management module refers to the enterprise editing its own information, so that graduates can understand the relevant information of the enterprise in time. The recruitment management module is responsible for editing the recruitment information of the enterprise. The enterprise searches for relevant talents through keywords, looks for graduates who meet the job requirements, and realizes online communication between the enterprise and the students by leaving a message. The enterprise information maintenance module is responsible for providing password modification services for enterprises [19].

In order to ensure the accurate and timely update of system data and information, the authority management mode is adopted to realize the one-to-one correspondence between the nature of user roles and authority, so as to realize the hierarchical user authority model. The personalized recommendation platform is composed of a personalized employment recommendation engine. It recommends jobs for graduates based on the information of graduates and enterprises and uses the recommendation based on user history information to realize offline employment recommendation. Real-time online employment recommendation uses recommendations based on real-time user behavior data. The employment information tracking management platform includes two functional modules: the employment information management module and the employment data statistics module. Among them, the employment information management module is responsible for recording the work information signed by graduates. The system administrator provides professional employment guidance information for graduates and checks the authenticity of the recruitment information released by the enterprise. Employment

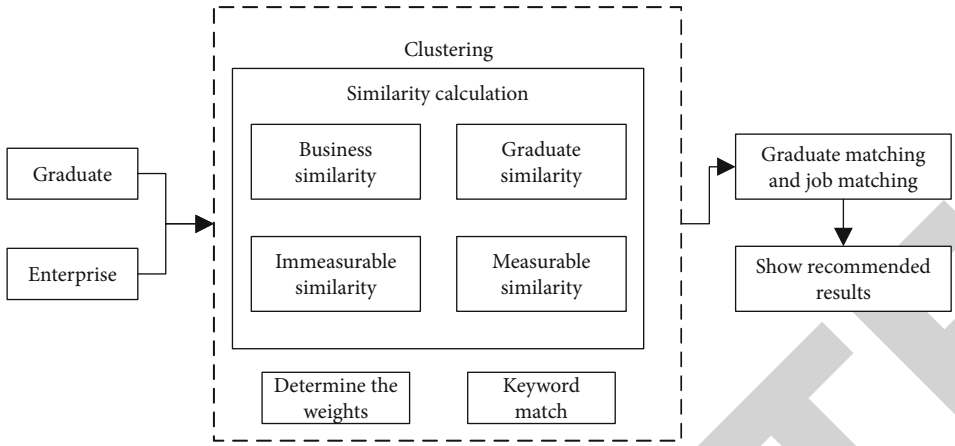

Figure 2: Recommendation model.

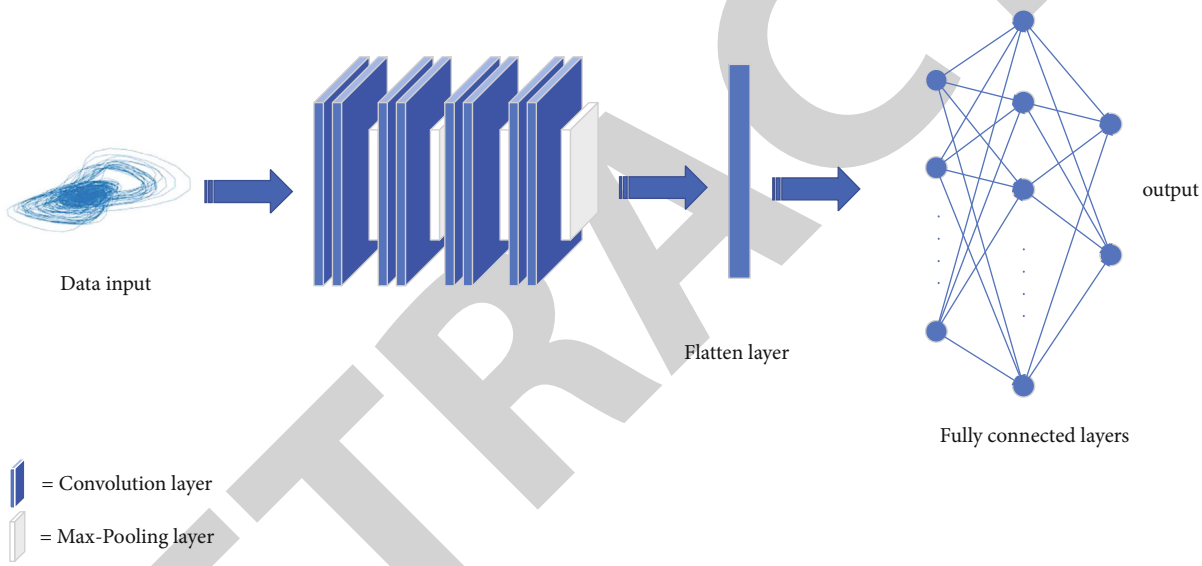

Figure 3: The structure of the convolutional neural network structure.

guidance analysis and statistics for universities according to recruitment information are made, and data support is provided for universities to improve teaching management [20]. The employment data statistics module is responsible for statistics of graduate information, enterprise information, and employment information; analyzes the trend of graduate employment and talent demand; and provides data support for universities to change their teaching models.

3.2. Recommendation Method Based on User History Information. The recommendation method based on user historical information realizes offline recommendation for users by calculating the similarity between graduates and enterprises. The data comes from the graduate management platform and the enterprise information management platform in the system. The recommendation model based on user historical information is shown in Figure 2.

Adhering to the principle of convenient research, the factors that have a significant impact on student employment are selected from the sample database to form an employment information analysis database. After the graduate employment information analysis library is generated, data conversion is performed, and the data conversion is to discretize each factor. The recommendation model based on user history information is responsible for calculating the similarity between graduates and enterprises and implementing clustering for them. The similarity calculation includes measurable similarity calculation and immeasurable similarity calculation. The calculation of the measurable similarity is to obtain the expected weight based on the basic information of the graduates and calculate the similarity of the graduates. The calculation of immeasurable similarity is to calculate the similarity of graduates by extracting keywords based on their practical experience and internship experience. The similarity of graduates is calculated by analyzing the employment characteristics of graduates and matching similar graduates according to the weight setting. The calculation of enterprise similarity is to implement

similarity calculation through information such as enterprise information and enterprise recruitment needs. Then, the clustering of enterprises and graduates is completed. The recommendation method based on user history information is to implement keyword matching according to the recruitment needs of enterprises and the employment characteristics of graduates, determine the weight according to the importance of the needs, complete the matching of graduates and graduates and jobs, and finally display the recommended results.

3.3. The Analysis of Graduate Cluster. In this paper, the method of the convolutional neural network is used to replace the traditional decision number method to create the database. The structure design of the convolutional neural network is shown in Figure 3.

The expression formula of the aggregation mode in this neural network is as follows:

$$H^{l+1} = \sigma\left(\widehat{D}^{-1/2}\widehat{A}\widehat{D}^{-1/2}H^{l}\theta\right), \tag{1}$$

where $\widehat{A}$ in the formula is the sum of the adjacency matrix and the identity matrix and $\widehat{D}$ is the sum of the diagonal and identity matrices. D represents the degree value of each node after adding the self-loop. The calculation formula of the convolution operation of the neural network can be summarized as

$$G[m,n] = (f * h)[m,n] = \sum_{j}\sum_{k} h[j,k]f[m-j,n-k], \tag{2}$$

where the input image is denoted by f, our kernel is denoted by h, and the row and column indices of the result matrix are denoted by m and n, respectively.

The employment characteristics of graduates belong to the basic attributes of graduates when they are employed, which can show the degree of similarity between graduates. According to the employment characteristics of graduates, the employment sign vector $P = \{P_1, P_2, \cdots, P_n\}$, P_{mn} is the nth attribute of the mth graduate, and the expression of P'_{mn} is as follows:

$$P'_{mn} = \begin{bmatrix} P_{11} & P_{12} & \cdots & P_{1n} \\ P_{21} & P_{22} & \cdots & P_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ P_{m1} & P_{m2} & \cdots & P_{mn} \end{bmatrix}. \tag{3}$$

We obtain the similarity of two different graduates' stu_i and stu_j in the same dimension according to the dimension of graduate employment characteristics. The calculation formula is as follows:

$$S_n\left(\mathrm{stu}_i, \mathrm{stu}_j\right) = 1 - \frac{\left|v_i^n - v_j^n\right|}{v_{\max}^n - v_{\min}^n}, \tag{4}$$

where graduates are $S_n(\mathrm{stu}_i, \mathrm{stu}_j)$, the nth attribute value graduate stu_i is v_i^n, the nth attribute value of graduate stu_j is v_j^n, and the minimum value of the nth attribute value is $v_{\min}^n$. Suppose the n-dimensional vector of graduate stu_i is $\mathrm{stu}_i = \{\mathrm{Pstu}_{i1}, \mathrm{Pstu}_{i2}, \cdots, \mathrm{Pstu}_{\mathrm{in}}\}$. Suppose the n-dimensional vector of graduate stu_j is $\mathrm{stu}_j = \{\mathrm{Pstu}_{j1}, \mathrm{Pstu}_{j2}, \cdots, \mathrm{Pstu}_{jn}\}$. The formula for calculating the Euclidean distance is as follows:

$$d_{\mathrm{stu}_i\mathrm{stu}_j} = \sqrt{\sum_{k}^{n}\left[\mathrm{Pstu}_{\mathrm{in}} - \mathrm{Pstu}_{jn}\right]^2}. \tag{5}$$

Since the feature weights of different employment feature dimensions are different, it is assumed that the graduate employment weight vector $\theta = \{\theta_1, \theta_2, \cdots, \theta_n\}$, so that the new distance formula can be obtained as follows:

$$d_{\mathrm{stu}_s,t_j} = \sqrt{\sum_{k}^{n}\theta_k\left[\mathrm{Pstu}_{\mathrm{in}} - \mathrm{Pstu}_k\right]^2}. \tag{6}$$

The expression formula of the overall eigenvector is as follows:

$$\mathrm{sim}_{\mathrm{stu}_i,5u_j} = \frac{1}{1 + d_{\mathrm{stu}_i,tu_j}} = \frac{1}{1 + \sqrt{\sum_k^n}\theta_k\left[P_{\mathrm{stu}_{im}} - P_{\mathrm{stu}_i}\right]^2}. \tag{7}$$

Through formula (5), the similarity between the feature vectors of each graduate can be obtained, so that it can be known that some graduates are similar, and the clustering of graduate groups can be implemented. Implementing the clustering method for enterprises with similarities is consistent with the clustering method for graduate groups. In order to compare and analyze the similarity between enterprises, each business of the enterprise is defined as a vector $c = \{y_1, y_2, \cdots, y_n\}$. The element of the demand for graduates in the corporate recruitment information is y. The two-dimensional data group that forms the enterprise and the demand is $Q[m][n]$, and each vector of $Q[m][n]$ represents an enterprise vector c. Enterprises can use formula (3) to calculate quantitative indicators and use content-based recommendation algorithms to implement text matching for nonquantifiable indicators.

3.4. Recommendation Method Based on Real-Time User Behavior Data. The recommendation method based on user behavior data is to understand user behavior preferences according to relevant data. Similar users are clustered according to different behavior preferences, and matching jobs are recommended for users. Data modeling is implemented through real-time data parallel processing capabilities, user-based collaborative filtering, and item-based collaborative filtering algorithms to achieve online real-time user recommendation [21]. User-based collaborative filtering means that if the remaining graduates with the same preferences as graduate A can be obtained, the results recommended for graduate A are obtained based on the status of the companies that these graduates pay attention to and the companies they deliver to. Assuming that the graduates who have acted on items are u and v, set the item set of graduate u to be $N(u)$ and the item set of graduate v to be $N(v)$. The relationship between u and

v obtains the similarity between u and v, and the calculation formula is as follows [22]:

$$W_{uv} = \frac{\left|N_{(u)} \cap N_{(v)}\right|}{\sqrt{\left|N_{(u)}\right|\left|N_{(v)}\right|}}. \tag{8}$$

Since most graduates may not have acted on a certain behavior, making $|N(u) \cap N(v)| = 0$, different behaviors will cause errors in the similarity calculation result, so the importance of different behaviors needs to be considered when calculating the interest similarity of graduates; the calculation formula is as follows [23]:

$$W_{uv} = \frac{\sum_{i \in N_{(t)} \cap N_{(b)}} \left(1/\log\left(1 + \left|N_{(i)}\right|\right)\right)}{\sqrt{\left|N_{(u)}\right|\left|N_{(v)}\right|}}, \tag{9}$$

where $1/\log\left(1 + |N_{(i)}|\right)$ can reduce the influence of general operations in the common preference of graduates u and v on their similarity.

Item-based collaborative filtering means that users recommend similar items to the items they liked. The specific steps are as follows:

Step 1: construct graduate u preference vector $[S_{u1}, S_{u2}, S_{u3} \cdots, S_{un}]^{\mathrm{T}}$ [24].

Step 2: construct a two-dimensional matrix of items and ratings. The ratings of different items are represented by U. The formula is as follows:

$$U = \begin{bmatrix} U_{11} & U_{12} & \cdots & U_{1n} \\ U_{21} & U_{22} & \cdots & U_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ U_{i1} & U_{i2} & \cdots & U_{\mathrm{in}} \end{bmatrix}. \tag{10}$$

Step 3: construct the item cooccurrence vector. The cooccurrence vector is a matrix representing how different graduates rate items, and the matrix represents the similarity between different items. Assuming that the number of users who rate item a is P_{a}, and the number of users who rate item b is P_{b}, the expression formula for the cooccurrence times of items a and b is as follows:

$$T_{\mathrm{ab}} = P_{\mathrm{a}} \cap P_{\mathrm{b}}. \tag{11}$$

Step 4: generate a recommendation, multiply the graduate preference vector with the items, and get a new vector, that is, the recommended vector R. The value of T_{in} is proportional to the degree to which graduates prefer an item and recommends the top n results for graduates according to the recommendation demand. The formula for calculating the recommendation vector is as follows [25]:

$$\begin{bmatrix} T_{11} & T_{12} & \cdots & T_{1n} \\ T_{21} & T_{22} & \cdots & T_{2n} \\ \vdots & \vdots & & \vdots \\ T_{n1} & T_{n2} & \cdots & T_{nn} \end{bmatrix} \begin{bmatrix} S_{\mathrm{u}1} \\ S_{u2} \\ \vdots \\ S_{un} \end{bmatrix} = \begin{bmatrix} R_{i1} \\ R_{i2} \\ \vdots \\ R_{\mathrm{in}} \end{bmatrix}. \tag{12}$$

4. The Analysis of the Experiment

Taking a university as the experimental object, from January to March 2019, the system was used to implement employment information management for the university, and the query management performance, response time performance, resource occupancy rate, and employment recommendation performance of the system were tested.

4.1. The Performance Test of Information Query Management. Taking job-seeking information in the management of university employment information as an example, after successfully logging in to the system in the text, graduates can perform job-seeking operations through the job-seeking management module [16–18]. Graduates can view all recruitment information in the system, and the results are shown in Table 1.

According to Table 1, the system in the text can effectively view the recruitment information, and the graduates can enter keywords to query and access the recruitment information of the relevant enterprises, so as to realize the online communication between the graduates and the enterprises. Experiments show that the system in this paper can effectively manage job-seeking information in university employment information.

4.2. The Performance Test of System Response. Using LoadRunner as a system performance testing tool, the system in the text, the system in Reference [3], and the system in Reference [4] are tested for the response time of the system when different users concurrently access the system. The test results are shown in Figure 4.

It can be seen from Figure 3 that the response time of the system in this paper is significantly lower than that of the other two systems when the number of concurrent users is different. When the number of concurrent users reaches 200, the response time of the system in the paper tends to be stable and remains within 5 s, indicating that the system response time in the paper is short. With the continuous increase in the number of concurrent users, the system in this paper still maintains a good response time and has excellent performance. With the continuous increase of the number of users concurrently accessing, the response time of the literature [3] system and the literature [4] system fluctuates greatly, and the system response time is relatively slow, indicating that the literature [3] system and the literature [4] system are not suitable for a large number of users to use the system together. If the number of concurrent users is too large, the system will crash and the system performance will be poor. The experiments show that the system in this

Table 1: Recruitment information view results.

Company name	Position	Number of recruits	Release time
A decoration company	Designer	20	2019/1/3
A technology co., ltd.	Software development	15	2019/1/3
A coal mining company	Department management	2	2019/2/8
A communication technology co., ltd.	Technical support	5	2019/2/14
An industrial co., ltd.	Buyer	1	2019/2/20
An educational institution	Course consultant	4	2019/3/11
A trading company	English translation	3	2019/3/15
A new material technology co., ltd.	Accounting	2	2019/3/16

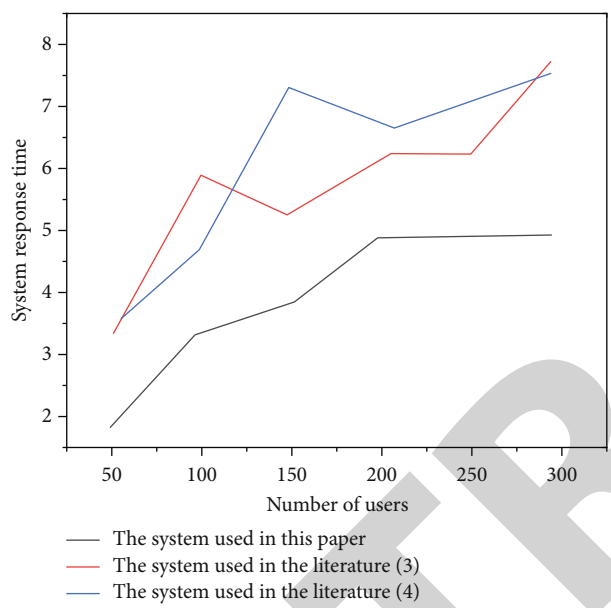

Figure 4: Response time test results of the three systems.

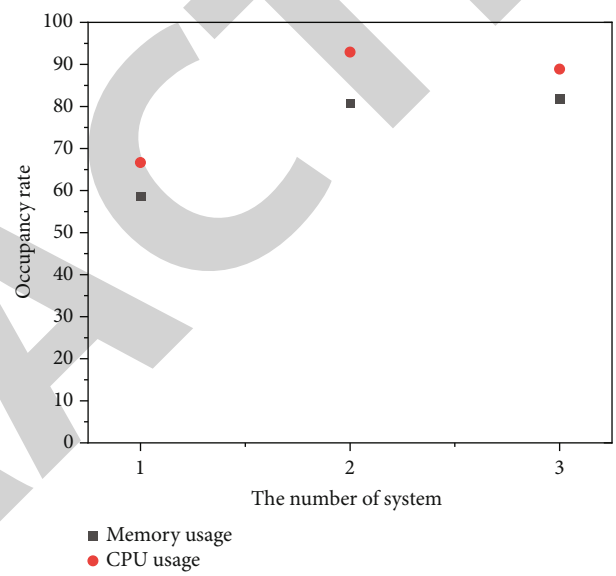

Figure 5: Web server resource usage.

paper has a faster response time and better stability when the number of concurrent users is different.

4.3. The Occupancy Test of System Resource. Taking 200 users concurrently accessing the system as an example, the Web server resource usage of the three systems is tested. The Web server resource usage is presented by two indicators: CPU usage and memory usage. The test results are shown in Figure 5.

According to Figure 5, when the number of concurrent user access is constant, the CPU occupancy rate and memory occupancy rate of the system in this paper are significantly lower than those of the literature [3] system and the literature [4] system. The CPU usage of the system in this paper is 28.4% and 24.4% lower than the other two systems, respectively, and the memory usage of the system in this paper is 27.2% and 28.0% lower than the other two systems, respectively. Experiments show that the Web server resource occupancy rate of the system in this paper is significantly lower than that of the other two systems, and the system in this paper can run stably without server crashes.

4.4. The Performance Test of Information Recommendation. During the period from January to March 2019, the system is used in the text to implement employment recommendations for some fresh graduates (1000 people) of the university, and the employment of these graduates and the previous year's graduates of the same major university is analyzed from January to March. The comparison results are shown in Figure 6.

5. The Analysis of Experimental Results of Classification Algorithm Based on Graduate Employment Management

The algorithm has been determined, but the number of datasets in the graduate employment database, the degree of dimensionality reduction during calculation, and certain values during calculation will also have a certain impact on the test results. This experiment is carried out from the following aspects. During the experiment, for the convenience of statistics, the method of changing a single variable is adopted. During the process of changing a single variable,

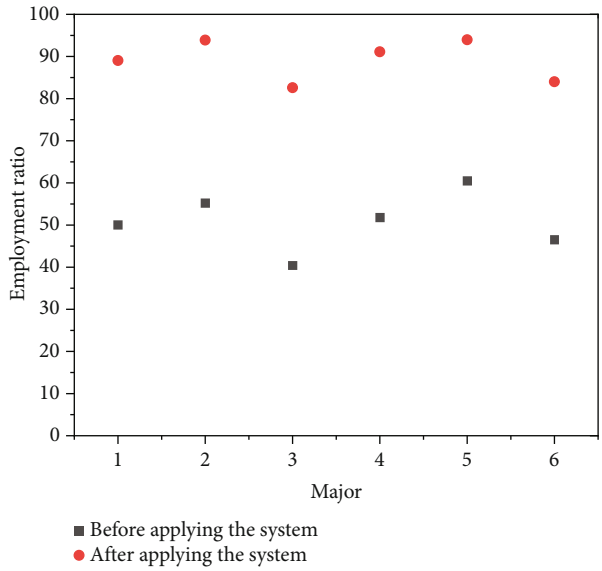

Figure 6: The results of comparison.

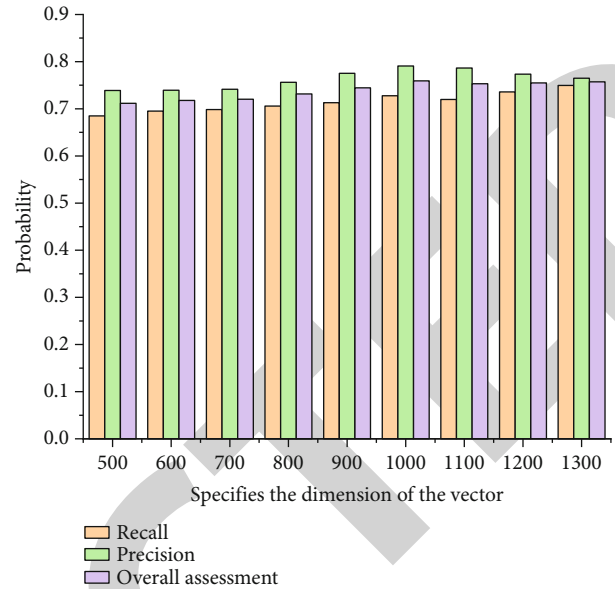

Figure 7: The result corresponding to the depth of dimensionality reduction.

Table 2: Statistical table of classification results corresponding to graduate employment information.

Number of single-category information	Recall	Precision	Average assessment
50	68.481%	75.501%	72.028%
100	70.201%	77.036%	73.648%
150	71.602%	78.703%	75.129%
200	72.790%	79.089%	75.898%
250	73.062%	80.379%	76.690%
300	73.899%	81.311%	77.593%
…	…	…	…
n	…	…	…

the rest of the variables remain unchanged, and the influence of a single environment on the whole is analyzed.

5.1. The Analysis of Classification Results Based on the Total Amount of Graduate Employment Information Data. In this experiment on the influence of the total amount of graduate employment information data on the classification results, a certain amount of data was selected from 10 basic categories in the information database. Each category selects 50, 100, 150, and 200 graduate employment information data for 38 tests, then counts and analyzes the final experimental data results, and draws a corresponding curve graph. And the final test results are analyzed; the relevant data of the test are shown in Table 2.

As can be seen from Table 2, with the increase in the number of graduate employment information, the classification effect has increased from 70% to 80%, showing a gradual upward trend. It can be seen that in the actual process, the more graduate employment information there is, the closer the final result is to the actual situation. Therefore, the analysis of the classification process of graduate employment information can be adapted to large-scale graduate employment information data analysis and can play a unique role.

5.2. The Analysis of Classification Results Based on Dimensionality Reduction Depth. The influence of the dimension of the selected feature vector on the classification results is studied, and the dimension of the selected feature vector is 500~1300. Since the calculation time is too long, eigenvalues of 500~1300 are selected for the test, and the test results are shown in Figure 7.

According to the data in Figure 6, a corresponding graph is drawn, as shown in Figure 8. When the selected vector dimension is 1000, the classification effect is relatively good. The whole picture can be understood as a parabola, and the most suitable dimension is equivalent to the maximum point of the parabola. When the vector dimension is low or high, the classification results show a downward trend, and the higher the vector dimension is, the more the recall and precision of the classification tend to coincide in the end.

This section investigates the impact of using different dimensionality reduction methods on the classification results. Table 3 shows the test results obtained by using different dimensionality reduction methods. The final results obtained by each classification algorithm are not very different, but in the actual test process, various methods can be used to reduce the dimensionality of vectors.

According to the characteristics of graduate employment information and the requirements of the graduate employment management system developed in this paper, the dimensionality reduction method in the test is selected as the information gain method, and the dimension of the feature vector is selected as 1000. The test results are shown in Figure 9.

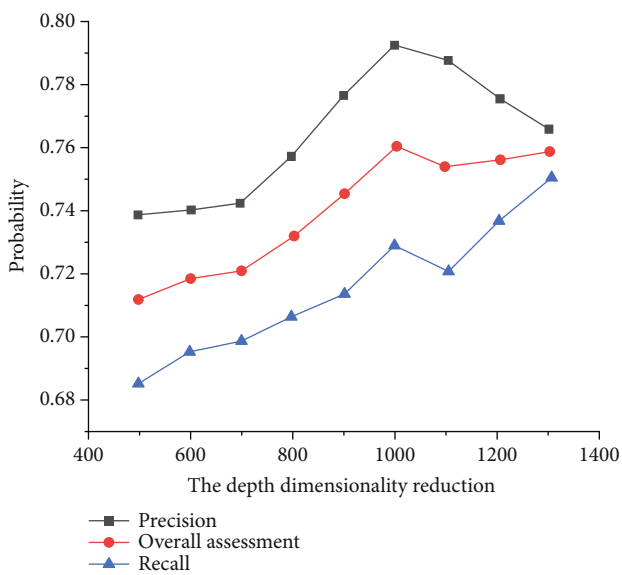

Figure 8: Dimensionality reduction depth graph.

Table 3: Corresponding result table of dimensionality reduction method.

Dimensionality reduction method	Recall	Precision	Overall assessment
Information gain	72.768%	79.088%	75.928%
Mutual information	69.573%	81.949%	75.772%
Hope cross-entropy	70.882%	81.279%	76.086%
The statistics of X^2	71.691%	80.047%	75.867%
Weights	70.587%	79.758%	75.180%

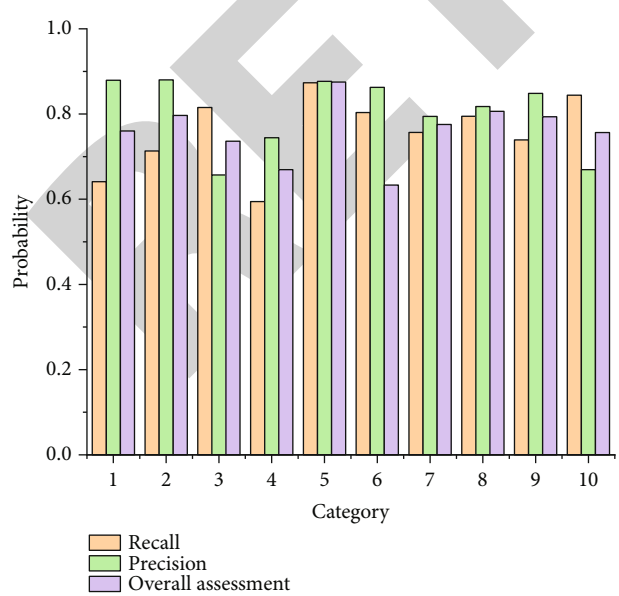

Figure 9: Histogram of classification results for each category.

6. Conclusion

University employment information management is an important part of the education work of colleges and universities. For this reason, a university employment information management system based on the big data platform is designed to enhance the service for the employment tracking of college graduates, improve the employment rate of college graduates, and grasp effective real-time information. It is very necessary to provide information on the supply and demand of university graduates and to provide data support for adjusting the university teaching management model.

Starting from the actual needs of the employment management of college graduates at this stage, this research is aimed at developing and designing a set of the employment management information system to fully meet the needs of graduate employment management and ensure the scientificity, efficiency, stability, and practicability of the system. We fully apply today's advanced computer technology in specific design and development to ensure the superiority and availability of the system. In addition, the convolutional neural network is also used to replace the traditional decision number algorithm to introduce the database creation link. It ensures the completeness and accuracy of the database information of this system and can evaluate and analyze the factors affecting employment more comprehensively and reliably. The system has fully realized the smooth employment of the students, the improvement of the employment level, and the improvement of the existing training mechanism.

In addition, the system also introduces the association rule algorithm into data-mining analysis, which achieves the following effects:

(1) Summarize data more clearly and accurately

(2) Improve the level of applicability of research analysis results

(3) Produce fewer rules

(4) It can be used to mine association rules between hierarchies

Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

This work is supported by the Priority Academic Program Development of Jiangsu Higher Education Institutions, Jiangsu Adult Higher Education Research Project (No. CJY-33).

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