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Retraction

Retracted: AI-Based Secure Construction of University Information Services Platform

Security and Communication Networks

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

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] Z. Wang, X. Du, and L. Wu, "AI-Based Secure Construction of University Information Services Platform," *Security and Communication Networks*, vol. 2022, Article ID 1939796, 9 pages, 2022.

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Research Article

AI-Based Secure Construction of University Information Services Platform

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The service efficiency of the university information services platform directly affects the efficiency of university management. However, the university has rich data resources and complex management, and how to construct a comprehensive, standardized, efficient, and shared university information services platform has become a research hotspot. In recent years, the progress of artificial intelligence (AI) in many aspects has created opportunities for its large-scale application in smart campuses. With the wide penetration of AI technology into all walks of life, especially in the fields of industry, commerce, finance, security, and so on, some technologies have experienced practical tests. Many scholars have discussed the significance and possibility of the application of AI in the field of education from a theoretical level. The university's secure information services platform can penetrate into all details of university management. Therefore, this paper studies the construction of a university secure information services platform based on AI, taking the dormitory allocation of freshmen and the face recognition of each building as the entry points. First, the beetle antennae search algorithm was introduced to improve the clustering efficiency and accuracy of the K-means algorithm for intelligent dormitory allocation. Then, the improved variational auto encoder-generative adversarial networks (VAE-GAN) model and convolutional neural networks (CNN)-based face recognition algorithm are proposed to enhance the security of building entry in universities. Finally, the simulation results reveal that the proposed two algorithms improve the clustering efficiency in dormitory allocation and the security of the university in the basic construction of the university information services platform, respectively.

1. Introduction

The development of China's education level has greatly improved in recent years. The impact of the development of information services in universities on education cannot be underestimated as it not only adapts to the development of technology but also meets the knowledge needs of undergraduates and has achieved good results [1, 2]. However, the disadvantages of traditional university information services are gradually appearing because they lag behind the development of modern technology [3, 4]. For example, personalized teaching is not obvious, systematic teaching is not comprehensive, and the service mode is not perfect, which greatly reduces the service efficiency of university information. In this case, how to improve the service efficiency of university information with the help of artificial intelligence (AI) technology, accelerate the construction of university information services platforms, promote the successful reform of university education, and achieve the goal of education is an important topic that many universities need to consider seriously [5].

Under the rapid catalysis of the information age, AI refers to making computers imitate the wisdom of the human brain so that machines can replace humans to complete complex intelligent work [6]. At present, the development of AI has become the future development trend, which can help universities realize information services to a certain extent. AI has strong computing power, which is not a problem for its data processing, effective collection, analysis, and integration of relevant data. The advantages of AI in education can be applied to all aspects of the secure construction of the university information services platform.

(i) *The application of AI in the teaching mode of the university information services platform.* As undergraduates have higher requirements for the teaching mode, the traditional teaching model is being eliminated [7]. At the same time, the traditional teaching mode does not reflect the subject status of undergraduates; teachers and undergraduates lack the necessary interaction; and AI provides the direction for these disadvantages. In addition, undergraduates have their own personality development. The traditional teaching mode largely ignores the needs of undergraduates' personality development, which is easy to make undergraduates lose interest in learning. For a variety of undergraduates' personality requirements, AI technology can systematically analyze them and enable undergraduates to actively learn according to their own interests to achieve good learning results.

(ii) *The application of AI in the study of university information services platforms.* For undergraduates, not every course can reach an excellent level, or even fail. For teachers, how to grasp the performance of each student and complete the teaching objectives has become one of the most difficult problems in teaching. Therefore, the new academic mechanism under AI provides a solution to this problem. Undergraduates' performance is not a simple score, and universities make comprehensive evaluations according to different scoring principles. Before that, teachers can use the effective processing technology of AI to process big data to comprehensively analyze undergraduates' performance, such as test scores and learning hours [8]. In addition, by analyzing the results, teachers give timely suggestions to undergraduates, flexibly arrange follow-up courses, and carry out hierarchical education to improve undergraduates' overall performance.

(iii) *The application of AI in undergraduates' management of the university information services platform.* The purpose of universities is to serve undergraduates, and the undergraduates' management of each university is not an easy task, mainly due to the large number of undergraduates and long study time. The information service elements under such big data have opened up the application field of AI. For AI, undergraduates belong to an information resource in essence. How to reasonably arrange these information resources in college life and learning is not a small challenge. For example, when freshmen arrive every year, it is necessary to integrate their information effectively first. AI is needed to classify the personal information provided by freshmen reasonably, and make reasonable arrangements for undergraduates' dormitories and classes to make undergraduates fit in and find a sense of belonging as soon as possible. In addition, campus security is also the focus of undergraduates' management, and AI platforms such as face recognition can effectively analyze suspicious personnel data, providing a basis for campus security and safety education for undergraduates. As the main direction of the construction of university information services platform, intelligent dormitory allocation and face recognition are studied in this paper.

The main contributions of this paper can be summarized as follows: (i) the beetle antennae search algorithm is introduced to improve the clustering efficiency and accuracy of the K-means algorithm for intelligent dormitory allocation; (ii) the improved variational auto encoder-generative adversarial networks (VAE-GAN) model and convolutional neural networks (CNN)-based face recognition algorithm are proposed to enhance the security of buildings entry in university; and (iii) the simulation results reveal that the proposed two algorithms improve the clustering efficiency in dormitory allocation and the security of the university in the basic construction of the university information services platform, respectively.

The rest of this paper is organized as follows: Section 2 reviews the related work; in Section 3, the improved K-means algorithm-based intelligent dormitory allocation in universities is studied; in Section 4, the improved VAE-GAN model and CNN-based face recognition are studied; the simulation results are presented in Sections 5; and Section 6 concludes this paper.

2. Related Work

In intelligent dormitory allocation, a K-means clustering-based algorithm is studied to improve the efficiency and accuracy of dormitory allocation in the construction of a university information services platform. There are many improved K-means algorithms for clustering and other problems. Sinaga and Yang proposed a novel unsupervised K-means clustering algorithm to find the optimal number of clusters without any initialization and parameter selection [9]. Liu and Li proposed a Bayesian hierarchical K-means clustering algorithm to construct a cascaded clustering tree [10]. Wang et al. proposed a three-way strategy-based three-way K-means clustering algorithm to improve the structure of clustering results [11]. Janssen and Wan studied how the spherical K-means algorithm can be applied to analyze extreme value observations from only one dataset [12]. Mai et al. used the K-means clustering algorithm to perform gene data [13]. Huang et al. proposed a robust deep K-means model to learn the hidden representation associated with different implicit low-level attributes [14]. Ming et al. proposed two scalable K-means algorithms for fast convergence [15]. Capo et al. proposed a fully parallel feature selection technique for the K-means algorithm [16]. Debelee et al. proposed a modified adaptive K-means method based on convolution to evaluate the collected images [17]. Zhu et al. proposed an evidence distance-based improved K-means algorithm, which had better clustering effects and convergence [18].

Many strategies have been proposed for face recognition. Abudarham et al. proposed a new framework that assumed that all faces have similar perceptual representations and combined cognition and perception to explain human high-level recognition of familiar faces [19]. Jayaraman et al. studied automatic face recognition methods in the forensic field [20]. Liu and Chen proposed a pose-conditional cyclic GAN to generate real and recognize preserving frontal face images for pose invariant face recognition [21]. By manipulating the eye distance of unfamiliar and familiar faces, Sandford and Bindemann explored whether face recognition depends on the measurement information assumed by configuration theory [22]. Hsu and Tang proposed a normalized frame of frontal and lateral poses for face recognition [23]. Le et al. used a new illumination compensation method to enhance the face image in the preprocessing stage of face recognition [24]. Sepas-Moghaddam et al. proposed a multilevel face recognition classification method to guide more effective face recognition solutions [25]. Ge et al. proposed a face recognition method based on identity diversity [26]. Wang and Guo proposed an attention augmented network to recognize masked faces [27]. Wang and Zhang proposed CNN with a multidimensional sequence occlusion face feature extraction module and used the deep learning method to improve the recognition rate [28]. Wu et al. proposed a novel face recognition network, FaceCaps to provide an efficient method for complex face expression recognition [29]. Zhong et al. proposed a face-part attention mechanism-based method to extract features of the whole face image [30]. Jain et al. presented a novel deep neural network-based facial expression recognition method [31].

Although the abovementioned related work has improved recognition rates, they are not designed for university management. In addition, they also do not consider the security of information. These two aspects motivate this paper.

3. Improved K-Means Algorithm-Based Intelligent Dormitory Allocation in University

University is a key period for the maturity of young people's mental health, and it is also an important stage for the continuous growth of their abilities. In the study and life of university, a dormitory is an important place and link of undergraduates' campus life, so the problem of the dormitory is an important part of undergraduates' coordination. The dormitory is the main place for undergraduates to study, live, and entertain, so it has a vital impact on their growth and development. Having a good dormitory environment is crucial, which can help undergraduates form their own civilization and their own values and will also develop a good ability to communicate with others. With the development of AI, the scale and number of personnel of the university are growing. In order to achieve better dormitory distribution and intelligent dormitory management, the university needs to further improve the service quality and service level to ensure the normal intelligent work of dormitory distribution and management of undergraduates. Based on the improved K-means clustering algorithm, this paper studies the intelligent dormitory allocation in universities.

3.1. Individual Data Acquisition of Undergraduates. Individual data of undergraduates are acquired in the form of a questionnaire survey, and multidimensional information such as undergraduates' psychology, living habits, and family background is collected before enrollment. The questionnaire survey sets primary and secondary indicators. The primary indicators are general indicators, psychological state, living habits, and family background. Secondary indicators are set below the primary indicators, and the secondary indicators are set under the general indicators, which are gender and age range. The secondary indicators set under the psychological state indicator are interest, hobbies, personality, and emotional stability. The secondary indicators of living habits include living in high school and resting environments, while the secondary indicators of family background include only children and family relationships.

3.2. Data Preprocessing. Through the previous analysis and in-depth verification of the data, the internal default values of sample data could be better operated. Data is collected and verified to show that it is mainly performed with default values, including deleting default values and the mean filling method. The distribution of data is multidimensional in the survey dataset, and data values are distributed in multispace and multistandards, which directly affects the results of data calculation and analysis. Data normalization processing is the most important link. The quantitative system will determine the evaluation system, and the quantitative systems of different dimensions need to be processed in a unified standard to solve the comparability of data between different dimensions. After the original data is standardized, the data of all dimensions are in a unified quantitative system for comprehensive evaluation. In-depth analysis and optimization of sample data can reveal more attribute value differentiation problems according to the attributes of the data. Through the mean filling scheme of the K-means algorithm, it can better help the data samples form a complete structure so as to ensure that the clustering work of the K-means algorithm can be more accurate, which has a qualitative leap and improvement for the intelligent dormitory allocation of universities.

The survey data samples are unevenly distributed, which are multidimensional chaotic data, and there is multispace nonstandard distribution, causing great interference to data analysis and processing. In order to process this problem, a K-means algorithm is needed that can quantify the dormitory distribution according to the actual data analysis, thus unifying standardized data processing so as to solve the dimension problem of data samples and carry out intelligent distribution of undergraduates' dormitories.

3.3. BAS-Based K-Means Optimization. In order to improve the sensitivity of the classical K-means clustering algorithm to the randomly selected initial clustering center and the problem that K-means is easy to fall into the local optimal solution, this paper introduces the beetle antennae search (BAS) algorithm [32]. Using the advantage of global optimization of BAS, the sensitivity of the clustering algorithm to initial value is improved and the probability of falling into a local optimal solution is reduced.

After the clustering is completed according to the initial clustering center, the clustering center is regarded as an individual of beetle, and the global optimization is carried out according to the rules of the BAS search algorithm. The sum of the Euclidean distances between the two detection points generated by the clustering center according to the random direction and each sample in the cluster is calculated, and the performance of the generated point is compared with that before moving. If the Euclidean distance sum of the generated point is smaller, it is moved. Otherwise, it is not moved. The optimized global search is summarized as follows:

(i) Input sample is set as $S = \{a_1, a_2, a_3, \ldots, a_n\}$ to determine the number of clusters k.

(ii) k sample points are selected randomly $\{b_1, b_2, b_3, \ldots, b_k\}$ from S as the initial cluster center.

(iii) The Euclidean distance is calculated between sample point a_i in sample set S and each cluster center, and we classify each sample point a_i into the nearest cluster C_j.

(iv) BAS search algorithm is used to find the new cluster center b' in each cluster C_j. The specific search process is as follows:

  (a) The current cluster center is taken as the centroid, and the coordinates of the left antennae a_l and the right antennae a_r are generated respectively.

  (b) The sum of Euclidean distance from each sample point is calculated in the cluster to the center of left antennae b_l' and to the right antennae b_r', which are E_l and E_r respectively. If $E_l < E_r$, then take $b' = b_l'$, and if $E_l > E_r$, then take $b' = b_r'$, otherwise take $b' = b'$.

  (c) We determine whether the cluster center changes and reaches the iteration times. If the stop condition is met, then return to the updated cluster center $\{b_1', b_2', b_3', \ldots, b_k'\}$; if the stop condition is not met, then repeat (a) and (b).

(v) We determine whether the clustering results meet the termination conditions. If not, repeat (iii) and (iv). If so, we terminate the algorithm and return the results.

The steps of the improved algorithm are as follows:

Step 1. We load the undergraduates' individual data and determine the number of clusters k, and k is the number of dormitories.

Step 2. k points are randomly selected as the initial clustering centers in the undergraduates' dataset.

Step 3. We calculate the distance between each point in the undergraduates' dataset and the k cluster centers.

Step 4. We divide each point into the nearest cluster (class).

Step 5. BAS algorithm is used to update the clustering center of each class.

Step 6. According to the updated clustering center, we recluster them according to the method in Step 3.

Step 7. We determine whether the termination condition is met. If yes, perform Step 8, and if not, repeat Step 2 to Step 6.

Step 8. The clustering center and allocation results of dormitories are returned.

4. Improved VAE-GAN Model and CNN-Based Face Recognition

In the university information services platform, face recognition not only brings convenience to the lives and learning of teachers and undergraduates but also effectively ensures the personal and property safety of teachers and undergraduates. The introduction of face recognition into the campus is of great significance to the construction of a smart campus. At the same time, it is also the general trend of educational modernization in the new era. This section proposes a face recognition algorithm based on deep learning, which is used in the construction of a university information services platform.

The classical model of convolutional neural networks (CNN) in deep learning technology has been widely used in imaging and other fields. Compared with traditional neural networks, CNN has the advantages of weight sharing, pooled sampling, and local connection. CNN is a multilayer neural network structure that is mainly composed of an input layer, a hidden layer, and an output layer. The hidden layer has multiple convolutional layers.

RefineNet proposes that all levels of features contribute to semantic segmentation and effectively uses multilevel features to fuse high-level semantic features with low-level detail features so that the network can carry out end-to-end high-resolution pixel-level classification and prediction. RefineNet's network architecture is primarily used for high-precision semantic segmentation tasks, and tests on some datasets have yielded excellent results. RefineNet's architecture takes various levels of detailed features at different stages of convolution and fuses them to achieve high-resolution predictions without maintaining large intermediate feature maps. Due to the imbalanced target size and inconsistent occlusion target size in each dataset, it is necessary to adapt to objects of different scales and fuse multiscale face features. In this section, pyramid pooling [33] is adopted to replace the RefineNet subnetwork. This module integrates the features of regions of different scales according to feature maps of different sizes.

Based on VAE-GAN, the improved VAE-GAN network model is proposed in this paper. At first, the image G with mask is considered as the input, the encoding vector V is considered as the output after encoder, the image G' is considered as the output through a decoder, G' is used as the input of discriminator D, and the discriminant image G' is false. The goal is that G' is close to the nonmissing G and the final output V of the encoder is close to a Gaussian distribution. Since V will be a coding feature of the face close to the training dataset, it is redundant with the extra information of the missing part. In order to ensure that the input of the generator does not contain the redundant information of the missing part and to facilitate the generator to be easy to train, V is fused as the face code and a random code R as the input of the generator. Taking the output G'' of the generator as the input of D and judge G'' as false. The nonmissing image G is taken as the input of D so that D determines G as true. Combined with the idea of partial convolution [34], this paper replaces the convolution layer of the encoder and decoder with a partial convolution layer. After each partial convolution operation, the mask needs to be updated. The specific update method is as follows: if convolution can change the output on at least one valid input value through the network, the position will be marked as valid. That is, the sliding window element values are all set to 1. Partial convolution can make the convolution process irregular masks, and the convolution result of each layer only depends on the effective pixel region of each layer so that the final result can adapt to any irregular mask, and the information of the surrounding effective pixels is taken into account at the edge of the missing area.

The mask face recognition model firstly takes the masked face as input into the improved RefineNet network. After the segmentation of various semantic regions, the missing regions are identified by RGB color categories. Then set the mask by dividing the image, setting the mask of the occlusion area to 0, replacing the mask area of the original image with the value of 0, and entering the mask together as the input into the improved VAE-GAN model. The result after inpainting the occlusion position is used as the input of the FaceNet algorithm to extract the face features and compare the faces. Combining intelligent dormitory allocation and face recognition, the scenario of secure construction of a university information services platform is shown in Figure 1.

5. Simulations

5.1. Setup

5.1.1. Intelligent Dormitory of University Information Services Platform. Simulations were performed on a computer with an Intel i7-11700K 3.6 GHz CPU, and 32 GB of RAM (3200 MHz). The proposed BAS-based K-means optimization was measured using the sum of squares due to error (SSE), accuracy (AC), Calinski-Harabasz index (CHI), and running time of the algorithm. Additionally, the proposed BAS-based K-means optimization is compared with three benchmarks: U-K-means [9], BHK-means [10], and TW-K-means [11]. The five test sets of diabetes, iris, vehicle, CMC, and robot navigation in the UCI public dataset were used for testing. The properties of the test dataset were shown in Table 1.

The metrics are summarized as follows.

(i) *SSE.* SSE is the sum of the Euclidean distances from the samples in the current cluster to the center of the cluster, which can be calculated as follows:

$$\mathrm{SSE} = \sum_{i=1}^{n} \left| s - C_i \right|^2, \tag{1}$$

where s represents all sample points in the cluster C_i, and C_i represents the clustering center of the cluster.

(ii) *AC.* For a given dataset S, the classification number is K, which is denoted as $C_1, C_2, C_3, \ldots, C_K$. Assuming that s_i represents the number of data points correctly divided into a cluster C_i, then AC can be expressed as follows:

$$\mathrm{AC} = \frac{\sum_{i=1}^{K} s_i}{|S|}. \tag{2}$$

The value range of AC metric is [0,1]. The larger the AC is, the higher the accuracy is and the better the clustering result is.

(iii) *CHI.* CHI means that the smaller the covariance of the data inside the cluster, the better the clustering result will be, and the larger the covariance between clusters, the better the clustering result will be, which can be calculated as follows:

$$\mathrm{CHI} = \frac{t\left(\mathrm{CM}_{cc}\right)}{t\left(\mathrm{CM}_{ci}\right)} \times \frac{n-k}{k-1}, \tag{3}$$

where t represents the trajectory of the matrix, CM_{cc} represents the covariance matrix between clusters, and CM_{ci} represents the covariance matrix of the data in the cluster. The larger CHI is, the tighter it is within each cluster, and the better the clustering effect is.

5.1.2. Face Recognition of University Information Services Platform. In face recognition experiments, the commonly used face recognition occlusion datasets FDDB, COFW, and MAFA were selected to complete the test. FaceCaps [29], FPA-FER [30], and DNN-FER [31] were selected for comparison. Simulations were performed on the face detection dataset and benchmark (FDDB), Caltech occluded faces in the wild (COFW), and multiscale attention feature aggregation (MAFA) datasets, respectively, and each group of simulations is carried out for 100 times. FDDB is a commonly used face dataset and benchmark test set, including occlusion, low resolution, different posture, and rich scenes. The COFW dataset is a small-scale occlusion detection dataset, which contains 1852 annotated faces with occlusion. The MAFA dataset is composed of 30811 images without occlusion and 35806 images with occlusion, which have different occlusion scales. It is a dataset specially used for face

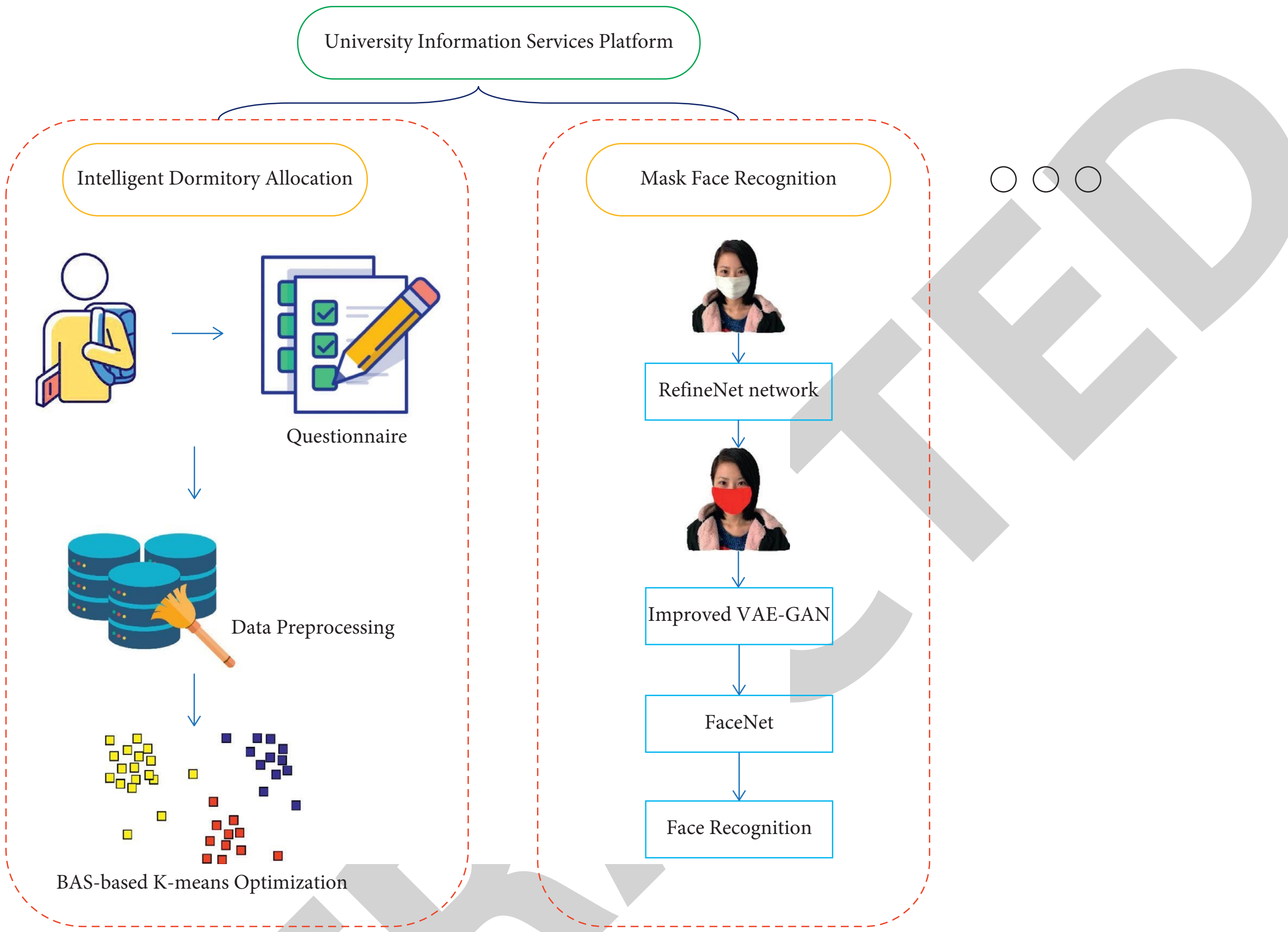

Figure 1: . The scenario of secure construction of university information services platform.

Table 1: . Test datasets.

Dataset	Instances	Number of features	Number of classes	Size of classes
Diabetes	768	8	2	268/500
Iris	150	4	3	50/50/50
Vehicle	846	18	3	199/217/218/212
CMC	1473	9	3	629/333/511
Robot navigation	5456	25	4	82/620/972/205/329

occlusion at present. The average recognition rate after 100 times of experiments was calculated. The simulation results were shown in Figures 2–4.

5.2. Comparison Analysis

5.2.1. BAS-Based K-Means Optimization. As shown in Figure 5, the BAS-based K-means algorithm proposed in this paper has the minimum SSE on five different datasets. While U-K-means has higher SSE on diabetes, iris, and vehicle datasets, but lower SSE on CMC and robot navigation datasets than on diabetes, iris, and vehicle datasets. As can be seen from Figure 6, compared with the three benchmarks, the BAS-based K-means algorithm has achieved a higher AC in the diabetes, vehicle, and robot navigation datasets, and it is worth noting that the AC reaches 100% in the robot navigation datasets. For the other three benchmarks, U-K-means has the highest AC in the CMC dataset, and BHK-means has the highest AC in the iris dataset. As indicated in Figure 7, CHI of the BAS-based K-means algorithm has a good performance in all datasets, especially in vehicle, CMC, and robot navigation datasets, the CHI is the highest. However, the U-K-means algorithm achieved the highest CHI in diabetes and iris datasets. On the other hand, BHK-means and TW-K-means perform flat, and the CHI of BHK-means in the CMC and robot navigation dataset is very low. Figure 8 indicates that the running time of all algorithms on the CMC and robot navigation datasets is relatively high, even the BAS-based K-means algorithm proposed in this paper is more than 0.1 seconds. Overall, the BAS-based K-means

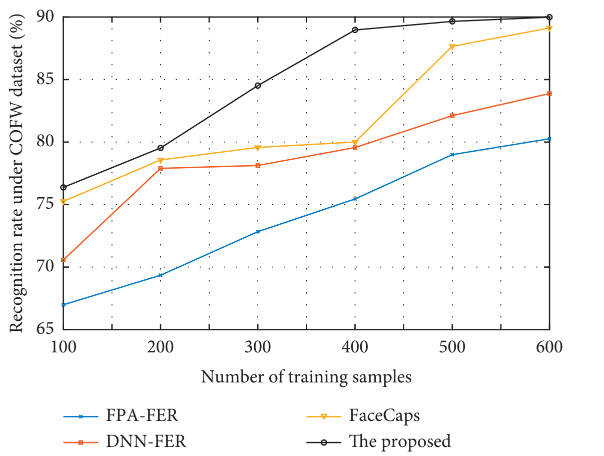

Figure 2: . Comparison of recognition rate under COFW dataset.

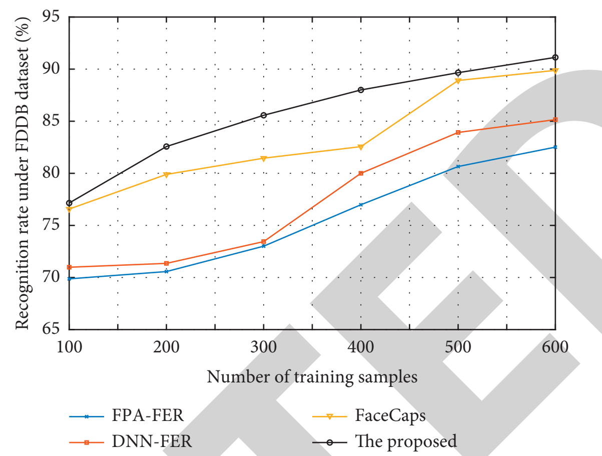

Figure 3: . Comparison of recognition rate under FDDB dataset.

algorithm keeps a low running time in all five datasets. Therefore, the BAS-based K-means algorithm proposed in this paper has obvious advantages in clustering effect, accuracy, and running time. In the construction of university information services platforms, dormitory distribution plays a vital role for undergraduates. A harmonious dormitory promotes the all-around development of undergraduates. The intelligent dormitory distribution method proposed in this paper plays an important role in the construction of the university information services platform and lays the foundation for the construction of subsequent information services platforms.

5.2.2. Improved VAE-GAN Model. As shown in Figure 2, in the COFW dataset, since COFW is a small occlusion detection dataset, the recognition rate of all algorithms on it is not high. When the number of training samples reaches 600, the recognition rate of the FPA-FER algorithm just reaches 80%. With the increasing number of training samples, the recognition rate of the algorithm proposed in this paper has always been less than 90%, and when the number of training samples is greater than 400, the network gradually tends to fit status. As can be seen from Figure 3, the recognition rates of the four algorithms on the FDDB dataset are all improved, which are not significantly compared with those on the COFW dataset. The recognition rate of the algorithm proposed in this paper only exceeds 90% when the number of training samples reaches 600. This is because the FDDB dataset is mainly used to study the face recognition problem in an unconstrained environment [35]. As indicated in Figure 4, the recognition rate of the algorithm and three benchmarks in the MAFA dataset is significantly improved. With the increasing number of training samples, the recognition rate of the proposed algorithm improves by leaps and bounds, which also relies on the MAFA dataset, specially used for face occlusion. The high recognition rate of the occluded face recognition algorithm is suitable for the current situation. In universities, security is always the most important thing. Without security, there is nothing to talk about. The efficiency of the proposed algorithm is suitable for buildings, dormitories, canteens, and other places in universities with high security. This is also indispensable in the construction of the university information services platform.

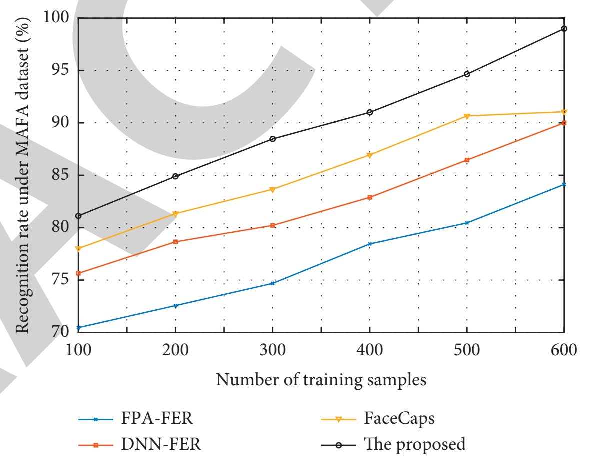

Figure 4: . Comparison of recognition rate under MAFA dataset.

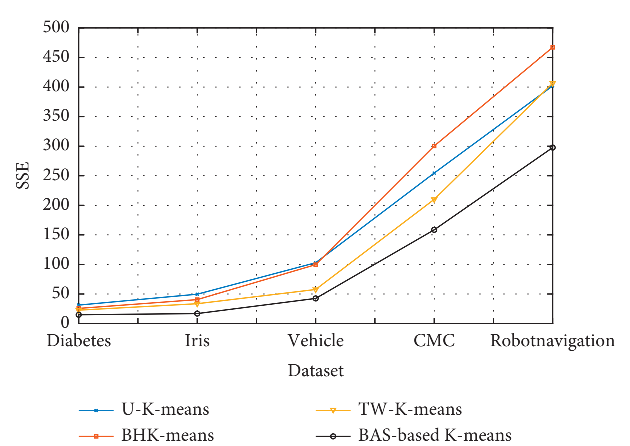

Figure 5: . Comparison of SSE.

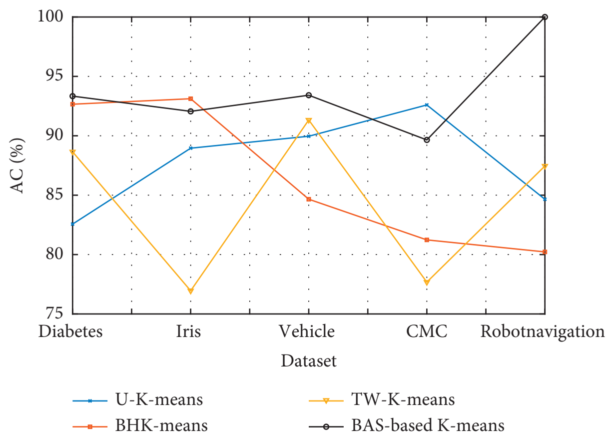

Figure 6: . Comparison of AC.

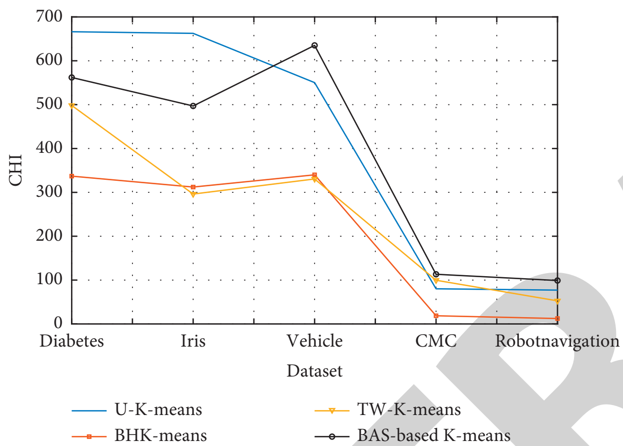

Figure 7: . Comparison of CHI.

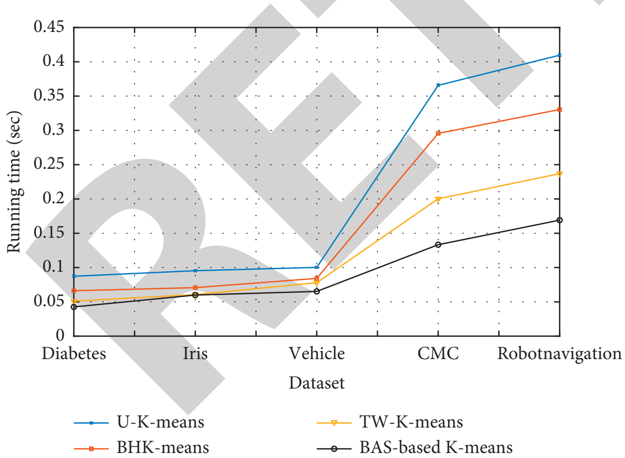

Figure 8: . Comparison of running time.

6. Conclusions

This paper studies the construction of a university information services platform, including intelligent dormitory allocation and face recognition. In order to improve the accuracy and robustness of dormitory allocation clustering results, an improved K-means algorithm based on the BAS algorithm is proposed. The improved algorithm uses the global optimization ability of the BAS algorithm to find the point with the least error in the cluster as the new cluster center in the updating cluster center stage. The improved algorithm is compared with other benchmarks on five public UCI datasets, and the results show that the improved algorithm is superior to other benchmarks in clustering performance. A face occlusion localization algorithm based on the RefineNet semantic segmentation model is proposed, which solves the problems that the previous completion training can only be carried out by manually setting the mask or detecting the occlusion rectangular frame, and the existing segmentation algorithm cannot adapt to the problem of targets with different sizes. Based on the existing generation models, an improved VAE-GAN face completion model is proposed, which solves the problem that the existing generation model is too free and cannot adapt to the occlusion area with different shapes and positions. An occlusion face recognition model is proposed to solve the problem of low face recognition rate under occlusion. The simulation results reveal that the proposed face recognition model has a high recognition rate under the FDDB, COFW, and MAFA datasets.

The CHI of this algorithm is not as good as expected. The next step will mainly consist of studying how to improve CHI and improve the clustering effect in the cluster. In addition, the occluded face recognition model proposed in this paper has not been deeply studied and improved in the direction of face recognition, and directly uses the feature extraction model of FaceNet. For the completion of large areas, the recognition rate of face recognition is still low. Based on this, the follow-up paper also needs more in-depth research and exploration.

Data Availability

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

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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