

Design and Implementation of Electronic Student Registration System in Colleges and Universities

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Abstract: As far as student registration is concerned, it is one of the important components of the student management system of colleges and universities, and can provide positive help for the effective development of other management work. Under the background of building a smart campus in an all-round way, colleges and universities should strengthen the active development of the electronic student registration system, properly solve the problems existing in the traditional student registration management, and provide convenience for the effective implementation of student registration and student registration management. Therefore, this paper analyzes the design and implementation of the electronic student registration system in colleges and universities from multiple levels, and lays a solid foundation for comprehensively improving the overall management level of colleges and universities.

1. Introduction

With the development of social modernization in China, information technology and Internet technology have been widely used, and the construction of campus information network has gradually become the focus of university management. In this process, in order to make the daily work and learning of teachers and students more convenient, and to effectively manage and utilize various information resources, many colleges and universities have started to carry out the construction of digital smart campus based on the Internet of things. According to the requirements of the Ministry of Education, at the beginning of each semester, colleges and universities should organize students to conduct a complete student registration. Students can continue to study in the university after completing the registration of the corresponding departments. In order to further improve the quality of college student management and protect the personal information security of students, colleges and universities should comprehensively explore the design and implementation of the electronic student registration system based on the real needs of the digital registration system, so as to provide more high-quality services for college teachers and students.

2. Overall Design Process of Electronic Student Registration System in Colleges and Universities

Combined with the analysis of the actual needs of the electronic student registration system in colleges and universities, the overall process of the electronic student registration system is systematically combed. Before the user enters the system, he / she should log in through the unified identity authentication system. After the login authentication is passed, it is determined whether or not his / her data is stored in the system library in combination with the ID of the specific user. If it exists, it is also necessary to judge whether the user ID belongs to the student identity or the administrator identity, and automatically connect the corresponding page according to different identities. For example, when the user is a student, the user should enter the student's personal information and registration page. When the user is a super administrator, then enter the administrator menu. When the user is an ordinary administrator, then enter the statistics menu of

student registration.

3. Design and Implementation of Electronic Student Registration Subsystem in Colleges and Universities

3.1 Detailed Design and Implementation of Data Synchronization Module

The data synchronization module should keep synchronization with the academic affairs information table, class information table and financial payment table of the university, and merge the postgraduate information table and undergraduate information table. The information tables of undergraduate and graduate students are stored in Oracle database, and the academic information table, financial payment table and class information table are stored in SQL Server database. On this basis, Oracle's calculation tool ODI is used to ensure that the source database table fields can form a mapping relationship with the system target data table fields, and then 5min is set as a cycle to ensure that the relevant data is always synchronized, so that the data in the system database can be highly consistent with the data in the source database.

3.2 Design and Implementation of Student Registration Module

First, user login authentication. In the system interceptor, students first access the unified identity authentication login page. The platform verifies the student identity, sends back the user information interface, and judges the user identity in combination with specific information. If it is judged that the user is a student, it is also necessary to judge whether the student is in the student group included in the system. If the user passes the verification, it is directly connected to the student page, and the administrator does the same.

Second, the student registration process. The registration verification module is the core of the electronic student registration system of colleges and universities. It is the interface to verify various requests / students / Registration. In this process, the processing request of the verification interface is mainly divided into two aspects: verifying the student information, verifying the student's school situation and his / her own situation. Students need to meet three conditions to register their student status: whether the student status information meets the requirements of the school status and learning status of the university, whether the Academic Affairs Office of the university allows students to continue to study in the university, and whether students pay tuition^[1].

3.3 Design and Implementation of Super Administrator Module

The super administrator of the electronic student registration system of colleges and universities has full authority to manage all kinds of ordinary administrators, green channel lists, and uploading of student photos. In the process of managing ordinary administrators, the specific process can be divided into counselor management and school-level administrator management. The super administrator needs to upload the photo of each student in the photo library of the electronic student registration system, mark the student's grade in the corresponding position of the photo, and select and call the face / images interface based on the grade. Then use the background to create a file directory for this grade in the server, and keep the binary streams of all photos in the newly created directory. In this process, not only the addition path of each photo should be recorded in the "student photo association table", but also each Euclidean space feature vector photo generated by Facenet network should be carefully recorded^[2].

3.4 Design and Implementation of Common Administrator Module

The specific responsibility of the general administrator of the electronic student registration system in colleges is to fully understand the student registration of all students within their own management authority. According to different functions, this responsibility is divided into two parts, to view the registration statistics and the registration information. By viewing the registration statistics, the administrator can view the registration statistics of each semester. The practice method of viewing the registration information is similar and basically the same. Based on the specific filtering conditions set by the administrator, the system background makes a quick and accurate

selection of the information of all students in the target grade, then returns to the previous interface by combining the front and back ends, and marks the marked student status, and marks the reasons for unregistered students. In addition, the administrator should also review the photos uploaded by the students. If there are no photos in the photo library or the quality of the photos is unqualified, the students need to upload them again^[3].

4. Design and Implementation of Face Service Subsystem

4.1 Face Recognition Model Training

The pre-training model provided by Facenet is mainly divided into CASIA-Web Face and MS-Celeb-IM based on the training face data sets. In these two data sets, the designed face samples are not Asian faces, and there are certain differences with Asians in feature points. Although the model trained on this basis can play an important role in the LFW level, it can't accurately recognize Asian faces. The main idea of Facenet is to map face photos in Euclidean multi-dimensional space and judge face similarity by using spatial distance. It is highly similar to the idea of LDA and requires that the distance between the same faces should not exceed the distance between different faces. Based on these two ideas, Facenet's loss function can output a 128-dimensional vector to the network and provide inception_resnet_v1 and inception_resnet_v2, two network options^[4].

4.2 Photo Library Management Module

In the electronic student registration system of colleges and universities, the face photos uploaded by students can lay a foundation for the full play of the face recognition system. Generally, the upload, change and deletion of photos are the responsibility of the administrator. First, MTCNN is used to extract the photos, and then it enters the Facenet network to extract, cut and change the size of the face. Finally, the last feature vector is saved in the database^[6].

4.3 Face Recognition and Face Verification Module

The trained Facenet model can provide services for the face recognition function. During the system startup, the Facenet model will be loaded in the memory. In the electronic student registration system of colleges and universities, the main function of the face comparison service is to provide services for registration on the Web side. After the photo library is saved as a feature vector, the difficulty of implementing the face recognition system is reduced. The / faces / verification interface will accept two parameters, one is the photo ID, which corresponds to the student's student ID, and the other is the binary stream of the student's face photos captured by the camera. In the process of detecting the binary stream of the student's face photos, the interface position uses the MTCNN algorithm. When the photo is trimmed and the face contour is adjusted, the face feature vector of the photo can be quickly obtained with Facenet. On this basis, combined with a specific parameter, usually the photo ID in the feature library, find the corresponding feature vector in the loaded memory, calculate the distance between them in Euclidean space. On this basis, compared with the standard threshold set by the system, if it is less than the threshold, it can be considered as the same person^[7].

5. Conclusion

Through the detailed analysis of the design and implementation of the electronic student registration system in colleges, it can be found that through the continuous optimization and improvement of the overall process of the student registration system, the content of the subsystem is more detailed and comprehensive. Combined with the optimized design of the face service system, the functional requirements of the electronic student registration system in colleges and universities are fully met. Colleges and universities need to focus on debugging the front and rear end technologies in the process of system research and development to ensure that all contents in the database of the electronic student registration system are highly consistent with the real situation,

so that the overall framework, database and structural features of the system can be optimized and designed, thus providing technical support for further strengthening the management level of college students.

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