

METHODS FOR BUILDING ACCESS CONTROL SYSTEMS IN UNIVERSITIES BASED ON BIOMETRIC IDENTIFICATION

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ABSTRACT

This article discusses the access control system in universities. The method of accounting for the working time of teachers of the department. The positive and negative sides of access control are found out. Examples of the introduction of an electronic journal are given.

Keywords: teaching staff, accounting of working time, control, electronic journal, university teacher.

INTRODUCTION

The article considers the method of using access control as a tool for effective organization of the teacher's time in the context of informatization of the educational process. A developed version of the access control method for teaching staff and employees implemented based on personal identification by biometric parameters is proposed. It should be noted that the traditional methods of monitoring the teaching staff through the exit-arrival log have many disadvantages. This method is no longer effective and has several disadvantages. The disadvantages of a traditional journal include that it does not have an electronic version, there is no way to identify it by a biometric parameter.

This article considers the implementation of access control to track the time of the teaching staff of the department and employees of higher educational institutions. The electronic journal as an identification method allows to correct some shortcomings. Development of the electronic information environment of the university. Formation of correct statistical reports in the field of recording the working time of the teaching

staff to increase efficiency. Improving the workflow between the administration, the department, the dean's office, and the personnel department. This will effectively affect the time of document circulation between departments of higher education institutions, reduce the number of paper versions of documents.

It is not difficult to see that part of the education takes place online. Systems such as moodle have been introduced, which have shown their effectiveness during quarantine.

If we make a comparative analysis, then we can say that the program "Employee Management System, Attendance Manager" has its advantages compared to the programs listed above, as it has more functionality.

The relevance of the development and application of an electronic journal at a university is determined by the following factors:

- introduction of an electronic method of attendance control, which allows you to automate working hours
- requirements for teaching staff, more productive use of teachers' working time
- calculation of the salaries of the teaching staff, due to the automation of the process, communication of the department with the personnel department and accounting
- requirements for the teaching staff of the department and university
- calculation of wages during sick leave, the program indicates how many hours the teacher's sick leave lasted and, depending on this, you can calculate the salary for children
- the transition to an electronic journal helps to automate the relationship of the department with the personnel department and accounting

MATERIAL AND METHODS

As a method of identifying a person by biometric parameters, methods of face image recognition are proposed.

Image recognition is directly related to pattern recognition. To recognize an image, key features such as facial features, selection weights, and related features should be taken into account.

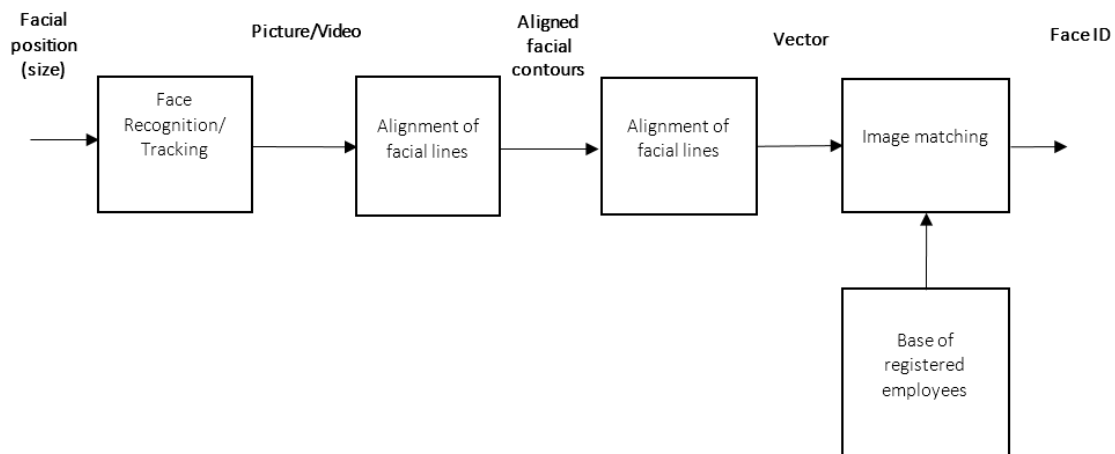


Figure 1. Image recognition process

The set of eigenvectors of the face image obtained from the training sample is used to recognize all other faces.

RESEARCH RESULTS

Let's do a principal component analysis. Covariance component:

1. Initial data: $x_{ij} = x_{ij} - \mu_i$. where $\mu_i = \frac{1}{n} \sum_j^1 x_{ij}$

those to the construction of a linearly independent system of vectors $\{x_1, x_2, x_3, \dots, x_n\}$ such that the most essential coordinates for recognizing the vector f'' in this basis

$$f = a_1x_1 + a_2x_2 + a_3x_3 + \dots a_nx_n$$

were his first in a small number, i.e., let's say the numbers $\alpha_1, \alpha_2, \dots, \alpha_5$. The union of discrepancies is calculated by the following formula $x_{ij} = \frac{x_{ij}}{\sigma_j}$, where $\sigma_j = \frac{1}{n-1} \sum_{j=1}^n (x_{ij} - \mu_i)^2$. Covariance matrix $\Sigma := XX^T$,

where X is the face image

In this case, when:

$$X_j \cdot X_k^1 = \begin{cases} 1 \text{ for } j = k; \\ 0 \text{ for } j \neq k; \end{cases}$$

We choose this basis using the singular value decomposition of the matrix F , composed of the rows f_1, \dots, f_{100} :

Computer vectors here: $\Sigma: W^T$

Projecting X onto k Principal Components

$$\begin{array}{|c|} \hline Y \\ \hline k * n \\ \hline \end{array} = \begin{array}{|c|} \hline W^T \\ \hline k * d \\ \hline \end{array} * \begin{array}{|c|} \hline X \\ \hline d * n \\ \hline \end{array}$$

When developing access control, an image database was used. Each image has 20 varieties, depending on size and condition

A biometric image recognition system recognizes an image by comparing it with images in the database.

CONCLUSION

In conclusion, we can say that traditional methods of access control are outdated and have been replaced by more effective and new methods, such as access control of employee attendance time. Access control has its advantages over traditional access control, it is more efficient, and it provides accurate attendance data. Access control performs the following functions:

- fixes the time of arrival and time of departure from the workplace,
- connected to the calendar and it is possible to view attendance for a specific day,
- communication between the department and the personnel department,
- communication with accounting,
- attendance statistics.

This method of access control allows the head of the department and teachers to track the personal and group dynamics of attendance almost continuously (weekly).

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