A safety prevention and control system applied to schools

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Abstract. The development of society is inseparable from the support of education. With the deepening of social attention to education, education has become the key direction of contemporary research. The concept of safe campus has gradually entered the public's vision. More and more families will consider the safety performance of their campus when choosing a suitable school for their children. Therefore, by analyzing the basic characteristics of the campus and considering the schools in a society, this paper puts forward a safety prevention and control system applied to this type of school environment.

Keywords: Safety prevention and control, System design, Campus security.

1   Introduction

As the focus of society, campus security is often a hot topic in the field of security. The design of safe campus system is the key inspection index of school evaluation in the industry. The common safe campus system takes the school perimeter, entrances and exits, fire passages, main roads, key areas, etc. as the core, and constructs a comprehensive intelligent safety prevention and control mechanism based on people, vehicles, time, location, behavior and other elements, including person / vehicle track, black / white list, temperature inspection and epidemic prevention, duty management, hidden danger investigation, safety supervision, early warning management and comprehensive evaluation, Provide the Education Bureau with all-round visual display and risk early warning management and control of school safety supervision, safety assessment, safety assessment, safety situation analysis, etc.

In addition, another important investigation factor of campus security is the behavior analysis of students in the school and the prevention of social groups, mainly aiming at more than 20 kinds of automatic early warning means, such as preventing aggregation, fighting / falling, one key alarm, off duty / sleeping early warning, intrusion early warning, blacklist early warning and comprehensive research and judgment of big data.

The most important thing of social security is personal safety, which reflects the safety of the next generation of students in the future. Maintaining campus security requires innovative wisdom and reliable system design. At the same time, the attention of all walks of life and the continuous efforts of researchers make the concept of campus security become the focus of today's society.

This paper analyzes the main problems existing in campus security, starting from the analysis of the basic situation of the school, and from the local observation of the prevention and control layout, puts forward a reliable campus security prevention and control system.

2   Current situation of school security facilities

2.1   Campus entrance and exit

There are 2 entrances and exits on campus. The main gate is the main entrance and exit for students entering / leaving the school during peak hours, the visitor channel is the entrance and exit for visitors, teachers and students during off peak hours, and the back door is the entrance and exit for vehicles.

2.2   Campus access

Building X of teaching building with X access channels; Complex building x, X access channels, X access channels to senior three classrooms; X access channels of the experimental building; X canteen access roads; 1 classroom access; X entrances and exits of music, sports and beauty building; Library access x.

2.3   Campus entrance and exit

Campus perimeter, dangerous chemicals storage room of experimental building, fire access, power distribution room, canteen back kitchen, canteen warehouse and other areas.

The safety prevention and control system designed in this paper has a certain application area, as shown in Figure 1.
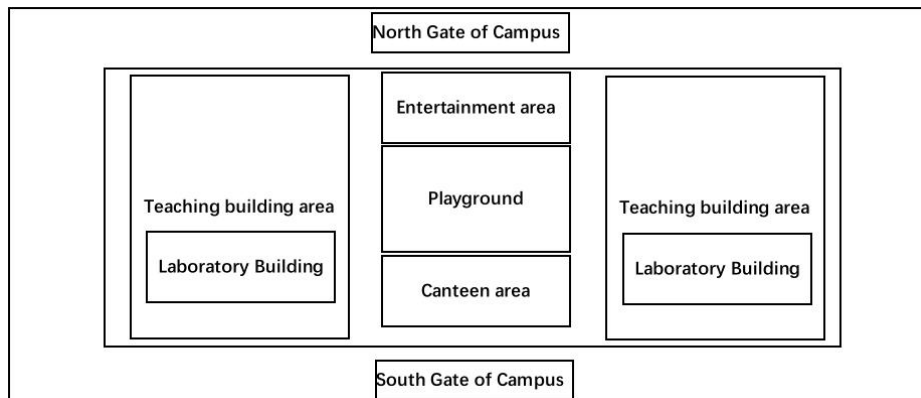

Fig. 1. School plane structure.

What needs attention in the structure shown in Figure 1 is that the experimental building area is often interspersed with the teaching building area, and the safety performance brought by experimental equipment and drugs is what we need to focus on. In addition, the equipment in the entertainment area and the scope of student activities in the playground are controlled. The prevention and control system will avoid potential safety hazards to the surrounding people caused by students' outdoor sports. Of course, the safety maintenance of fitness equipment needs to be grasped.

3   System function deployment design

In this section, we will focus on the safety prevention and control design based on the school's own layout and architectural layout.

3.1   School entrance

Main entrance and exit.
- Equipment configuration: 4 face capture cameras;
- Installation position: two-way face capture machine at the front door of the school (2 in and 2 out);
- Access management: set face recognition function to register and manage the white list of students and teachers entering and leaving the school in peak hours; When there are blacklists or strangers entering the school gate, immediately pop up the screen to inform the security guard, so as to facilitate the security check, so as to ensure that non school personnel can enter the school only after registering through the visitor channel

Visitor access.
- Equipment configuration: 2 face capture machines and 1 passenger plane with one person and one certificate;
- Installation position: one passenger plane is installed in the visitor registration office, and one face capture machine (one in and one out) is installed in both directions of the visitor channel;
- Visitor management: register visitors by means of person card comparison and verification, and formulate corresponding visitor trajectory planning and set the school validity period according to the respondents. When the visitor tracks abnormally or fails to leave school beyond the validity period, the system will generate a prompt to notify the security duty room. The system provides complete visitor information and action track data;
- Access management: realize the access records of school students, teachers, staff and visitors during off peak hours. The white list of students, teachers and staff in and out of the school is senseless collection peers. They screen strangers and prompt the security guard to start registration management. For the blacklist and other

personnel, they will generate early warning prompt and notify the security duty room. The system supports track playback and continuous video summary playback

3.2 Entrance and exit of school buildings

Academic Building.
- Equipment configuration: 6 face capture cameras;
- Installation position: two face grabbing machines are installed in the entrance direction of the front door of the teaching building, and one face grabbing machine is installed in the entrance direction of the four side doors;
- Access management: realize the senseless attendance and face passage records of school students, teachers, staff and visitors in the teaching building area. The white list of students, teachers and staff in and out of the school is senseless collection peers. Strangers are screened and prompted, and early warning prompt is generated for blacklist and other personnel to notify the security duty room. The system supports track playback and continuous video summary playback

Complex building.
- Equipment configuration: 4 face capture cameras;
- Installation position: Two face grabbing machines are installed at the front door of the complex building, and one face grabbing machine is installed in each of the two access directions of the senior three classroom;
- Access management: Realize the senseless attendance and face passage records of school students, teachers, staff and visitors in the area of the complex building. The white list of students, teachers and staff in and out of the school is senseless collection peers. Strangers are screened and prompted, and early warning prompt is generated for blacklist and other personnel to notify the security duty room. The system supports track playback and continuous video summary playback.

Restaurant.
- Equipment configuration: 3 face capture cameras;
- Installation position: Two face grabbing machines are installed at the front door of the canteen and one face grabbing machine is installed at the side door;
- Access management: Realize the senseless attendance and face passage records of school students, teachers, staff and visitors in the canteen area. The white list of students, teachers and staff in and out of the school is senseless collection peers. Strangers are screened and prompted, and early warning prompt is generated for blacklist and other personnel to notify the security duty room. The system supports track playback and continuous video summary playback

Laboratory building and Library.
- Equipment configuration: One camera shall be equipped at the entrance and exit of the above channels (the original camera shall be used);

● Installation position: Use the original surveillance camera and fine tune the position according to the actual situation;

● Access summary: The existing surveillance video at the entrance and exit of the experimental building and the library is used for video structural analysis. When someone enters and exits, the system will automatically record the personnel access information of the channel, classify and sort it into storage, and automatically filter out the video without access

● Access statistics: use the existing surveillance cameras at the entrance and exit of the library to realize the statistics of the number of students entering and leaving the library. The system provides the function of counting the number of people entering and leaving the library in different periods

The computer laboratory is also accompanied by unexpected situations such as electric leakage, congestion and accidental contact, which need specific analysis. Figure 2 shows the structure diagram of a computer laboratory.

Fig. 2. Structure diagram of Computer Laboratory.

Playground. The playground mentioned in the paper also includes a gymnasium, including the main places for students' outdoor activities. Sports activities are essential in campus activities, but they also include some dangerous physical education courses and activities.

● Equipment configuration: 8 face capture cameras;

● Installation position: 2 for each door of the playground;

● Security personnel management: there are many doors in open places such as the playground. At ordinary times, we only open four of them, and set up fences around to reduce the impact of dangerous goods on the external environment. At the same time, we set up an action observation team to patrol near the playground regularly, so as to empty the surrounding people when there are signs that there may be dangerous actions.

4   Conclusion

Campus security prevention and control is of great significance. The campus security prevention and control system proposed in this paper has made a clear plan by analyzing the school layout, so it has strong practical value.

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