

GIS APPLIED ON A STUDY OF CHINESE CULTURE UNIVERSITY'S CAMPUS SAFETY

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ABSTRACT

“How is the security in the campus?” becomes a hot issue, after problems of campus security occurred in recent days, such as vitriol splash and violence. Students are ignorant about those unsuspected danger in campuses. They can't even avoid it.

We try to inject the theory of Environmental Behavior Study into this study. According to the surveys of Chinese Technological and Vocational Education, the campus safety includes 16 subjects, like school buildings, fire preventions, equipments of water and electricity and anti-violence...etc.

Based on the researches of Chinese Culture University, we will examine the illumination and scopes, the guard patrolling paths, and the danger locations in campus that are investigated into users' emotion in environmental psychology. In order to find out where the dangerous places are, we apply the function of buffer in Geographic Information System (GIS). By connecting geo-database and spatial features, we will make an analysis and see the two opposite concept, safety and danger, in a campus.

Finally, we will use those factors to make a degree zone map of the safe and dangerous places in the campus of Chinese Culture University. We will also offer suggestions to the management of campus security.

Key Words: Campus Safety, Geographic Information System, Spatial Analysis, Environmental Behavior Study.

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1. INTRODUCTION

Recent years, lots of criminal events of university campus attracted public attention. In the college campus, interactivity is frequency and complexity. However, most of college campus designers didn't consider the security and space functionalities. This kind of campus design resulted in potential security issue to the unconsciousness students. When the criminal event is happened to the students, they can't protect themselves as well as prevention capability (H. D. Bih, 2002).

In fact, this kind of danger and unsafety events could be avoidable. To attract public attention on campus security issue is our primary motivation to do this research. Also the relevant suggestions about the security improvement are offered.

Basically, we pick PCCU campus as our study case from various sizes, allocations of campus due to the closer relationship with PCCU. We also implement GIS space analysis function to plot the campus security compound map and offer school security management suggestion how to enhance the security management capability. We expect other scholars with same research area to continue corresponding study to grow the campus security.

2. THEORY

The root causes of campus security issues are unsafe campus environment and unsafe behavior of individual. Unsafe campus environment means that machinery or hardware is not proper used. Unsafe behavior of individual means that the individual activity is not appropriated. If we can eliminate two above factors, we can prevent the security event happened.

The discussion of environment security was originated from western countries in 70's. The scholars tried to prevent the security issue happened by environment design, management and plan. Generally speaking, the topics of campus security are campus accident, criminal event, environment disaster, and other safety issue (Yang Ying-Hong, 1999). For example, from PCCU security record of recent a year, thief is the major problem for the campus security. Harassment is not so common in the campus. However, most of female concern the campus security very much as far as are afraid of some places in the campus.

"Secure" is the basic need of human life. Although dangerous area may not happen criminal event, such kind of area is still a space for potential hazard (Day, 1994). If the human doesn't have clear sight, easily run away in certain environment, it will generate the fearfulness feeling in human's mind.

Lack of illumination and light, it will provide the possibility of criminal. Improved illumination could encourage people to have more activities in the campus as well as provide informal and natural monitor (H. D. Bih, 2002). Illumination is not only for the commuter but also pedestrian. A common security test: Could you tell an individual face out of 15

meters in main traffic route?

According to the research of Education Bureau, there are sixteen items related to college security which are building, fireproof, water and power equipment, experiment safety, water disposal management, violence etc (Chinese Technological and Vocational Education, 1995).

Security includes environment, behavior and psychology. Here we only consider the simple way to evaluate the campus security. In environment factor, we choose the position and coverage of illumination to evaluate. We create the same range of buffers above the illumination. In behavior factor, we choose patrol route of security guards and places of patrol boxes to evaluate. In the psychology factor, we make a survey to find safety and high risk areas. We will give the plus or minus scores to every factors. Finally, we are overlapping layers to make the PCCU Security compound map.

3. OPERATIONAL CASE

Based on the researches above, we tried to draw PCCU security compound map through the GIS space analysis skill upon three security factors: the position and coverage of illumination, patrol route of security guards and places of patrol boxes, and high risk areas.

3.1 Practical Investigation

Make the statistics of high-risk areas through the survey, the position and coverage of illumination, and patrol route of security guards and places of patrol boxes.

3.1.1 Illumination

Draw the illumination coverage map through practical investigation. The unit of service area is 10 meter. If there is illumination, the safety score will be +1. Otherwise, its score is -1 (figure 1).

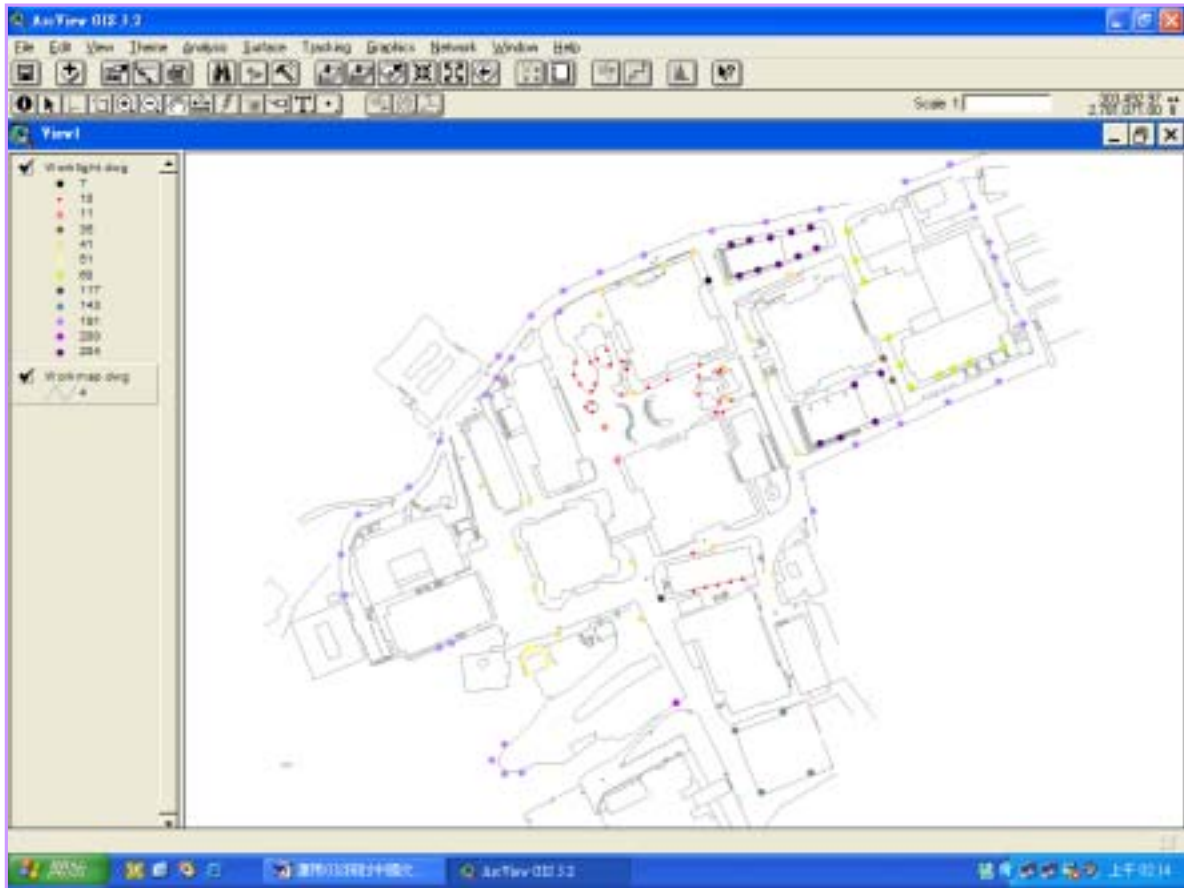


figure 1 A map about location of illumination

3.1.2 Patrol Route of Security Guards

Visit security guard and record the patrol route everyday (three shifts, 10-12_Pam, 4-6 10-12pm). Also gets the position of patrol boxes in the campus (there has 20 dots:). If this area could be monitored by security guard, the safety score will be +1 for this area. Otherwise, its score is -1 (figure 2).

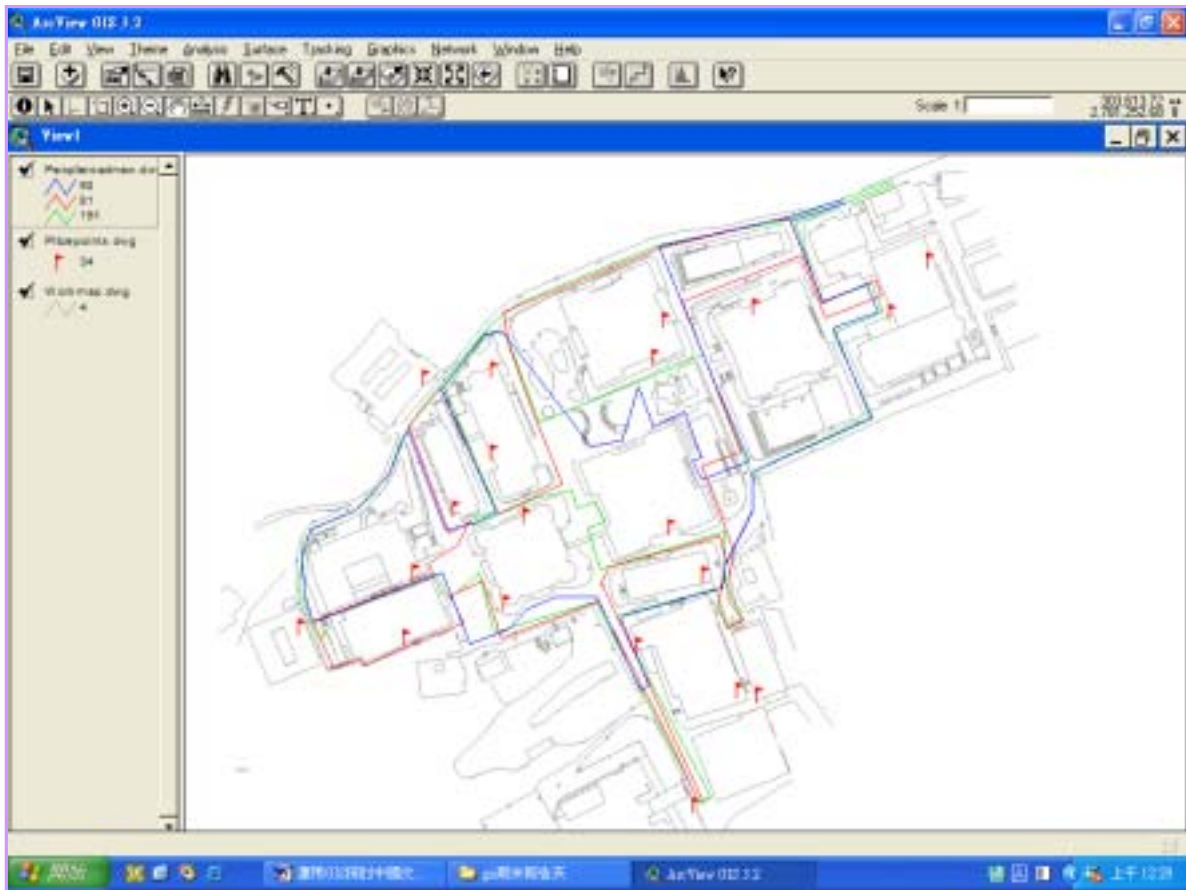


figure 2 A map about patrol route of security guards and places of patrol boxes

3.2 Investigation

Through the random sampling, to ask 30 students to mark high risk areas in the campus map. We gave -1 score to these marked areas (figure 3).

3.3 To Make a Compound Map

We can get the PCCU security compound map by the weighing and overlapping three maps above, to create a Security compound map of PCCU (figure 4).

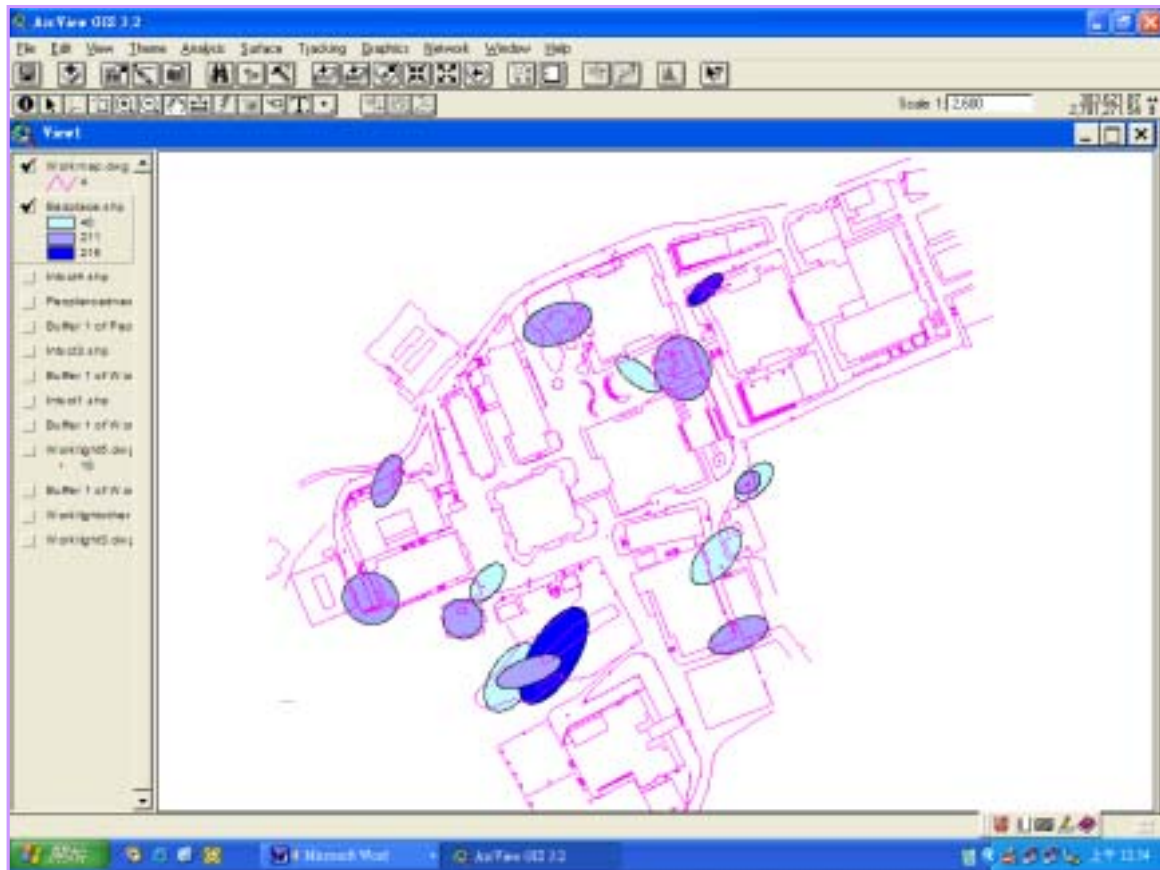


figure 3 A map about dangerous areas in environmental psychology

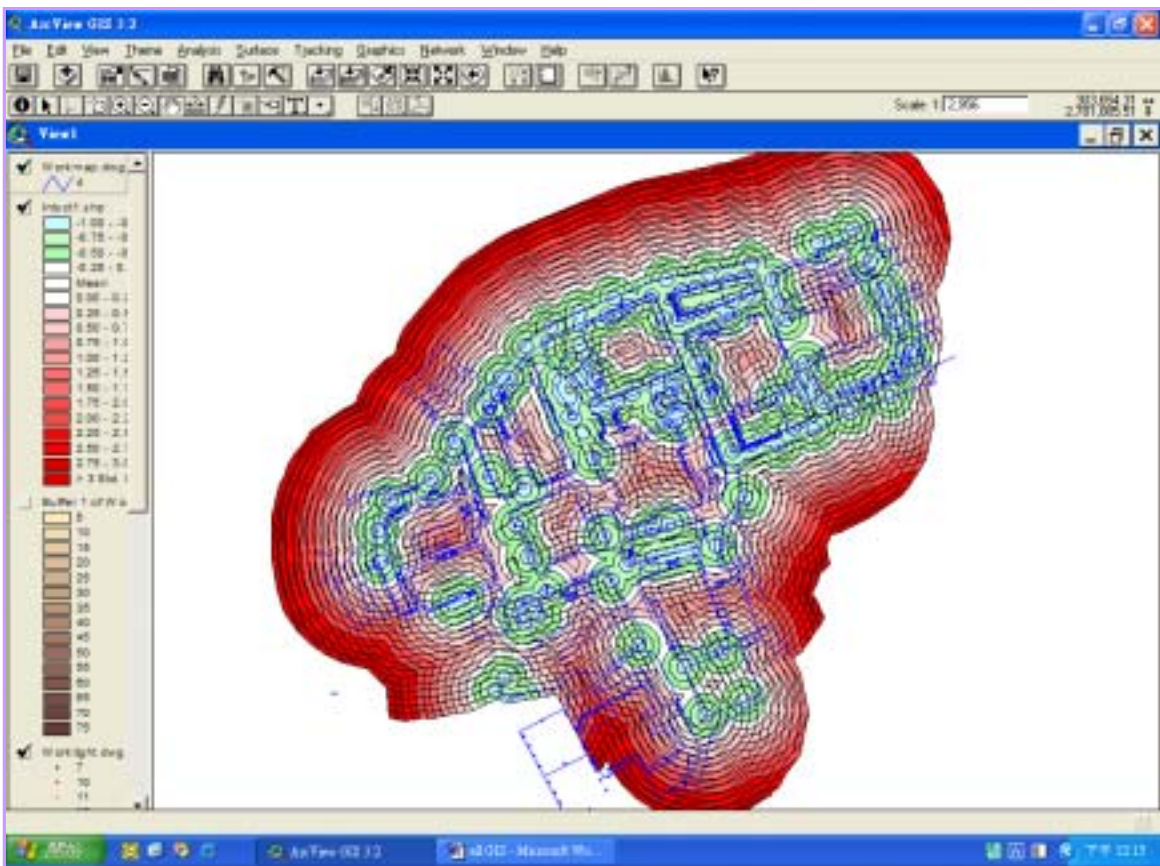


figure 4 Security compound map of PCCU

3.4 Commentary on Result

From the PCCU security compound map, we can see that central area of campus, intense activities area, Da En Building and sports field are the safety areas due to the plenty illumination and intensive security guard patrol. However, Da Ci building, parking lot and Xiao yuan memorial are high risk areas due to lack of illumination and security guard patrol.

4. CONCLUSIONS AND SUGGESTIONS

According to our result, we can make the last conclusion and suggestion simply about the survey.

4.1 Conclusion

In the study we found that: The security guard will make students to feel so safe, if we can increase density of the patrol of security guards to high risk area (Da Ci building...etc.), we believe we can low down the possibility of criminal events.

4.2 Suggestion

1. The campus security could be improved by three suggestions below:
 - (1) Illumination: Enough lightening could enhance the vision ability.
 - (2) Increase the chance to monitor the criminal activity, Attract more people to obtain unformal monitoring ability on criminal events. Strengthen the penetration ability of vision and audibility to make easily communication and support between different space users. This could eliminate the dead corner and cover of criminal.
 - (3) Formal monitor and rescue system. The patrol of guard and monitor of video camera could increase the secure feeling and lower down the possibility of criminal.
2. The factor in our study about the campus safety is preliminary. There are a lot of factors to effect safety in campus. In the future, we will to value the relation between two factors, and give more suggestion to the administrative department.
3. However, “a sense of security” is a part of perception. It will change when the time goes by in different space. In the future, we can discuss it in the other fields.

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