

## Research of New Kinds of Urban Management Based on the Technology of 3s

Li-yiran

applied technology college  
University of Science and Technology Liaoning  
anshan, china  
e-mail: lyr7879@yahoo.com.cn

Zhang-chunna

Software Engineering  
University of Science and Technology Liaoning  
anshan, china  
e-mail: zcn1979@yahoo.com.cn

**Abstract**—The successful development of New digital urban system with 2d and 3d is based on ComGIS, on c# 2008 for development platform, on Oracle10G for background database. The critical techniques during the development include techniques of WebGIS, techniques of 3D display, pages of local fast refresh using Ajax, and spatial data and attribute data of coupling management and so on.

**Keywords**-WebGIS; Spatial database; Local refresh using Ajax; 3D urban management

### I. INTRODUCTION

The 3D simulation technology is the focus of attention at domestic and overseas in the scientific and technological fields, its development change rapidly<sup>[1]</sup>. The research of 3D stereo display has become a hot topic in the field of computer graphics, 3D animation technique combined with the computer video and audio technology can better simulate the simulation scene, with the development of dynamic monitoring and 3D flight simulation, 3D landscape seems to be more real, intuitive and vivid<sup>[2]</sup>. 3D simulation technology is part of the virtual reality technology, which is often closely linked with virtual reality technology. Dynamic, real-time display system, high-speed computer processing, intelligent interactive multimedia technology are the key technologies for virtual reality, the key of 3D visual simulation technology and also 3D simulation technology application in digital city construction's bottleneck.

### II. THE TECHNICAL DESIGN OF THE OVERALL SYSTEM ARCHITECTURE

The support platform of system is mainly used to assist the business processing platform, which is divided into three parts, they are: the GIS platform of 2D and 3D, the access platform of public call center and the central database of urban management.

The platform of business processing is mainly used to complete the entire process of the digital urban management business (Find-Solve-End -Evaluation), which is also a core part, the others services for the platform. It includes six subsystems of admissibility, collaborative work, monitor command, comprehensive evaluation, application maintenance, resource management.

### III. THE KEY TECHNOLOGY OF THE SYSTEM

#### A. WebGIS technology

That there are a variety of different techniques was applied to study the realization of WebGIS. In general, the WebGIS uses the following 4 methods to achieve:

- 1)Using the method of CGI to construct the WebGIS;
- 2)Using Plug-in technology to construct the WebGIS;
- 3)Using the ActiveX control and a object model technology of DCOM component to construct the WebGIS;
- 4)Using Java or .NET language to construct the WebGIS;

The visualization technology about the urban 3D is also known as virtual reality, the computer simulation is used to generate a 3D virtual world to provide users with visual, auditory, tactile and other sensory simulation, users seems to be immersive, they can be timely, no limit to observe the objects in 3D space.

This system is mainly optimized the load model from two aspects, one is in the aspect of hardware to make full use of CPU and GPU resources to avoid a large number of operations in the memory; another is in the software aspect to establish the LOD (Levels of Detail) model. The system-generated effects are shown in Figure 1.

Recently, the method of LOD generation for model simplification includes: subdivision, sampling and deleting, the system uses a subdivision.

Subdivision with a very simple basic model represents the initial model, and iterative subdivided model according to certain rules, each step increased more and more detail to the local area of the model, until the details of the model meet requirements that user defined error. The following figure shows that the simplification process about a terrain model was subdivided by subdivision, the process shown in figure 2.

#### B. Partial refresh based on Ajax technology

Due to the B/S structure adopted, the staff will inevitably called urban management information in the browser. At present, the transmission of network information is mainly use hypertext protocol ( HTTP ), using the method will cause the interface refresh each visit daemon, when it suffer the map operation with the large amount of data, frequent map operation will cause the

screen flicker, the system is running slow until it collapses. In order to avoid occurrence of such cases, the system introduces the technology of Ajax.

That the development of the WebGIS based on the technology of Ajax gives full play to the characteristics of the technology of Ajax in the Web publishing mode, and the client response is more sensitive. Through the arrow keys move the map, which reduce the waiting time that the map calls, so as to realize the map portion updates, and change the mode to update the entire page in the past. The advanced technology of Ajax fused to the WebGIS digital urban management system, promote it has been a qualitative leap. Its operating mode as shown in Figure 3.

#### IV. DESIGN AND IMPLEMENTATION OF THE SYSTEM FUNCTIONS

Previously has talked about the system business logic part consists of six sub-systems, according to the actual situation carry out the extension of the subsystem and dock with other management systems in accordance with the specific business needs. The following will introduced the function of several core subsystems:

1)The subsystem of cooperative work: It is the core of the system platform, all business logic of the digital urban management system transit through it. Through the browser deal with the urban management of the business and inquiries information, can also be provided to the supervision center, the urban management department, various professional departments and leaders at all levels.

2)The subsystem of supervision and acceptance: It designs specifically for the center's call center of the urban management and supervision. That the various of ways submits the event message delived to the working platform of the call center operator through the information transmission service engine.

3)The subsystem of monitor and command: It services for the urban management departments at all levels and supervision center. Through the monitor or large screen, it display the relevant map information of the urban management, of the case and other detailed; and also query and display individual information about the current status of each community, supervisors, components and so on.

4)The subsystem of comprehensive evaluation:In accordance with the working process, the main responsibility, work performance, standards set evaluation

model within the system, Application of data mining and technology of geographical information system, a comprehensive analysis was conducted for all information about personnel, events and related case, to calculate assessment and form evaluation results.

The other main functions and the screen's shot are as follows:

1)The 2D map operation: the necessary map browsing function was realized in the process of map browsing, it is include: microscope, micrify, scale display and locate etc. function, at the same time can also be based on all kinds of attribute information query positioning on the map, as shown in figure 4.

2)The 3D map operation: the function, such as the model loading of city level, the tour of city, the panoramic photos, playback of vehicle historical track, fast positioning and the measurement of space distance, is achieved. as shown in figure 5.

#### V. CONCLUSION

The system of digital urban management is a comprehensive platform, it should have very high scalability, facilitate upgrades in future, and with security, municipal and other system connection, the country is vigorously developing the geographic information platform about space sharing, the system should be improved in which. In addition, the 3D part of the digital urban management still has strong expansibility, functions can be tailored according to the actual needs of the city.

#### REFERENCES

- [1] Otmar Ertl, Siegfried Selberherr. Three-dimensional level set based Bosch process simulations using ray tracing for flux calculation[J]. *Microelectronic Engineering*, 2010,87(1):20-29.
- [2] Kezicong . *Ajax Development Essentials*[M]. beijing: Publishing House of electronics industry, 2006.
- [3] Zheng Yue-feng, Ma Wei-feng, Mao Ke-ji. Research on the application of education information service platform based on WebGIS[J]. *WSEAS TRANSACTIONS on COMMUNICATIONS*, 2009,8(1):92-101.
- [4] Paola Salvati, Vinicio Balducci, Cinzia Bianchi, Fausto Guzzetti, Gabriele Tonelli. A WebGIS for the dissemination of information on historical landslides and floods in Umbria, Italy[J]. *Geoinformatica*, 2009,13(3):305-322.
- [5] Ali Mesbah, Arie van Deursen. A component- and push-based architectural style for ajax applications[J]. *Journal of Systems and Software*, 2008, 81(12):2194-2209.



Figure 1. The 3D scene view



The initial model Basic model First subdivision Second subdivision

Figure 2. The model subdivision structure

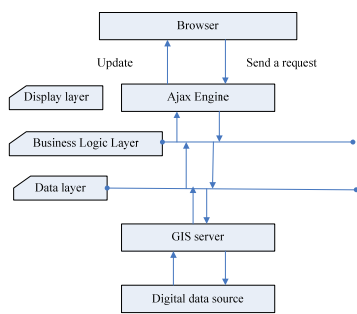


Figure 3. Ajax operation mode



Figure 4. The 2D effect maps



Figure 5. The model for batch loading effect chart