Research on Applying Web3D Technology to College Library - Instruction of Online Book Navigation System

RESEARCH ON APPLYING WEB3D TECHNOLOGY TO COLLEGE LIBRARY
—INSTRUCTION OF ONLINE 3D BOOK NAVIGATION SYSTEM

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ABSTRACT

Nowadays, Interactive Web3D technology is blossoming into a mature stage, which has influenced many fields such as business, education, and entertainment. In numerous ways which Web3D technology can help college libraries provide new services, Virtual Reality is the one of the most common ones, which has already been used for years. However, most traditional 3D model only can provide 3D browsing function for they cannot communicate with outside resources. Thus, this article focuses on researching how to use web3D technology to provide new book navigation services for libraries’ users. As new users of libraries especially those large libraries often feel hard to find what they want in those complex reading rooms, Web3D technology can directly display the process of how to find the target objects while most traditional web-based book navigation system focus on precise result of book orientation, which can greatly meet the needs of libraries’ users.

1 INTRODUCTION

Though 2D images are dominating the internet webpage currently, 3D images will surly take a prime position in the near future. Nowadays, Interactive Web3D technology is blossoming into a mature stage, which has influenced many fields such as business, education, and entertainment. Using Interactive Web3D technology to establish digital library is a region which optimistically expected by many experts but still doesn’t have a qualified example. This article is about to discuss a method to build a functional model with this advanced technology which can be practically used by every college library.

2 BACKGROUND AND RELATED WORK

2.1 Web3D technology applications in foreign countries

Second Life, Google Earth and World of War Craft are the most well-known Web3D platforms in this planet. They were played a vital role in virtual reality, geographic information systems, and electronic entertainment area.

Take the Second Life as example, as the pioneer of Wbd3D technology, Second Life established a "online utopia", its development have great reference value to those followers. Second Life enjoys three main merits: First of all, all the data are stored on the servers, which make the client software
becomes to “Browser software”; Moreover, Second Life have its own script system, which support Secondary Development. Also, Second Life support display 2D webpage in a 3D view. Due to the characteristics of open source, users can build any kind of buildings in Second life, including the library, however, the construction of virtual library still stay in a primary stage. Though owning lots of technologic advantages and features, Second Life can only provide some simple services such as message board or hyperlinks to the traditional website.

2.2 Web3D technology applications in China

As the most advanced library in China, the new National Library building reached a brand new level of the construction style and conceptions. The new National Library uses Quest3D as the virtual platform provide virtual touring service; on the other hand, National Library developed a book navigation system which uses 2D image to guide users to find their target books.

By using Quest3D as virtual touring software, the whole system can provide excellent vision efforts. However, while using Holographic motion-sensing technology provide unprecedented user experience, this model cannot communicate with outside database, which restrict this model only in providing virtual simulation service.

National Library’s book navigation system using webpage fetch data directly from the Aleph500 system, by add independent bookshelf position information to the sheep, along with the application of RFID technology, navigation server can produce precise picture guide user to find what they want.

Basically, National Library’s book navigation system and virtual touring system are separated by their different functions.

2 DESIGN AND IMPLEMENTATION OF ONLINE 3D BOOK NAVIGATION SYSTEM

In order to build such a 3D model easily and compact, we select SketchUp by Google as the modeling tools, SketchUp can create 3D model easily, especially for building construction. As for the web-based data sever and interactive script parts, Virtools can provide third-party 3D model file input, access to mainstream database files, GUI for scripts compiling, and so on.

Comparing with National Library’s book navigation system’s precise book orientation, this project is emphasizing to design a system which can show users the process of finding the target material. Full 3D book navigation workflow will make the whole process more direct and easy, even those new users can find what they want in the complex and burdensome reading rooms and book shelves.

Separation of database and 3D model is a major feature of the project. In the actual operation of the library, book shelves’ arrangement always changed with the metabolism of books. Traditional 3D model usually gathering all the information inside the model, which makes it very difficult to modify.
Meanwhile, the model in this project realized that webpage, 3D model, databases are operated independently, if any part of this system needs some modification, it won’t influence other parts’ function. Modeling standardized, modular model also make the subsequent development of the project full of flexibility.

Moreover, book navigation not only can help users to find their target published resources, but also can help librarian bookshelf arrangement. Author of this article have designed a book navigation 3D module which can post and get data from an independent database or directly interact with the database of ELS system. User can use OPAC to research books, and then send related information to the web3D page, after that the 3D model embedded in that page will be activated automatically, the 3D model will research the database where have the book shelf information. Finally, the character in the 3D model will walk to the target book shelf. This solution enjoys several merits.

3 EXPERIMENTAL RESULT

As this article are using Demo1.0 as the example, 3D model in Demo1.0 have already combined with library webpage and successfully get the information from the OPAC page then send them to the 3D model. By editing OPAC research page, users’ requests are sending to virtools’ server, then triggered the behavior of the character. After that, the character will automatically choose the shortest routine between the starting point and destination and show the users how to get the right place. Because this model is designed in the same scale, layout, the Demo1.0 is already has some practicality.

In this project’s future plan, 3D model in Demo1.0 needs solve several difficulties as follows:

1. Optimization model, lower the hardware requirements. Gathering dozens of reading rooms in one 3D model will slow down the speed when users using this system, this system need find a solution with can relieve the burden of CPU and GPU and remain the user experience at the same time.

2. Feasible camera controls. Future Demo’s should pay enough attention on camera control. Due to the consistency of the content of library’s 3D model, single angle camera cannot distinguish target from a crowd, which will not help users to familiar with the navigation path.

3. Compile GDI between Virtools Server and Oracle database. Currently, Virtools server only support Microsoft Access and SQL server, this book navigation system needs a suitable GDI to realize the communication.

4. Design Aleph500’s data sheep layout and book position information. Design reasonable field in the Aleph500’s data sheep would reduce the additional workload of Circulation Department and Editorial Department.
5. Adding user free touring function to the system. When using the free touring function, the system could provide some introduction information which can provide even more excellent user experience.

4 CONCLUSION

In near future, new technology and equipment will enhance the Web3D virtual browse technology. For example, panoramic camera can obtain three-dimensional information both conveniently and efficiently and thus reduce the production time of 3D model. Person Computer, especially those handhelds such as cell phone, PDA, UMPC, MID will equipped with much powerful graphic accelerate chips, which can help them to deal more complex 3D model. Meanwhile, development of wireless network will also help more and more users willing to use online servers.

The construction of digital library will greatly depend on the development of network, and the construction of digital library also needs library’s website to provide more services which can make users feel easy to use the library. Web3D technology can provide more intuitionistic, personalized user experience. Therefore, this technology’s prospect is worthy to be expected.

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