

Chapter 9

Exploring the Use of a 3D Virtual Environment in Cultural Transmission to Show Chinese Cultural Project “Confucius’ Journey” as an Example

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ABSTRACT

The use of 3D virtual technology in cultural transmission has been more and more innovative and popular in the recent years. Meanwhile, with the high interactivity, experience of virtual technology deeply rooted in the people’s hearts, the use of 3D virtual world in cultural transmission shows an evident advantage. Through scene construction and intelligent interaction in a 3D virtual world environment, we developed the project “Confucius’ Journey”. And considering the problems in such applications, such as the lack of interaction and reduced effectiveness in representing the application purpose, we explored interactive objects and virtual human technology. In addition, we can verify the advantage of using the 3D platform via the experimental results.

INTRODUCTION

Confucius, the famous ideologist, educator, politician in the Eastern Zhou Dynasty during the late Spring and Autumn Period, the founder of Confucianism, is a representative of Chinese traditional culture, and as a result, Confucianism has profound and lasting effects on China and the world. Recently, The Confucius Institute plays an important role in spreading Chinese traditional culture, which enables us to see

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the evolution of Confucianism. Development of the network and virtual reality technology has provided convenience to cultural transmission; as a result, our cultural project “Confucius’ Journey” reproduces real historical scenes of the period of Confucius in the 3D virtual reality platform – OpenSim”. Meanwhile, through the Linden scripts language (LSL) and OpenMetaverse, we realize interactive objects and virtual humans for the navigation, conversation, and instruction to enrich the interaction and to avoid having tourists wandering aimlessly in the world.

BACKGROUND

With the development of computer technology, virtual reality has been widely used in city planning, junketing, medical science, aerospace and military applications, etc. There is also great progress in the conservation of cultural relics, culture recovery, and culture transmission. Although there are many 3D applications, few projects are related to Chinese cultural transmission on the basis of deep research.

There are some examples of the similar applications to achieve culture transmission goals. In China, an intelligent and interactive application named 009, which uses a virtual pet dog image to communicate with users, was developed by the ShenzhouTuji, Institute of Computing Technology, Chinese Academy of Science(ICT) and Shanghai Jiao Tong University over two years. Application 009 provides location information service through interaction. However, because its characters and scenes are too simple in the virtual environment, users can only participate in passive learning through simple dialogue. In addition, in the virtual Forbidden City project developed by IBM, despite the use of high resolution, fine 3D modeling technology and autonomic interactive virtual roaming, it is difficult to achieve effective cultural transmission due to the lack of interaction and ineffective immersion in the environment. By taking advantage of this platform, the proposed system increases the interaction types and improves the effectiveness of the interaction by solving the above-mentioned problems.

OpenSimulator (here referred to as OpenSim) is an open source project that focuses on the creation and development of virtual worlds. Since 2007, OpenSim has been developed by following the BSD open source protocol, which aims to achieve interoperability with the SecondLife (SL) and other different clients; as a result, users can gain access to data resources through different clients and different network protocols. Due to its plug-in architecture design, OpenSim allows companies and individuals to build their own server and to develop specific applications, such as animation, military and commercial applications.

SecondLife (SL) is a massively multiplayer role-playing virtual world released by Linden Lab. Through the control of avatars, residents can perform the acts of roaming in the environment, written communication and voice communication. With the release of the client source code in 2007, functions based on SL have endlessly emerged and have gradually achieved widespread attention in academic research, business, education, entertainment and other fields. For business purposes, SL developers did not open the official server code, but other developers want an open, extensible platform that allows the three-dimensional application promoters to have their own world, by passing Linden Lab’s business management. By studying the SL client code, OpenSim understands the communication mechanism and realizes the server APIs’ decompiling. In addition, the APIs’ can be used in the research and development of SL and OpenSim. Because of the network protocol compatibility with SL, OpenSim can be used to create personal clients and realize the control of avatars and data access.

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