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Prospects for future museum interaction based on current technology——The Cross temporal Dialogue with Tang Dynasty Poets

Yuanzhuo Chen[1],

Xingyuan Zhang[2*]

and Ziheng Li[3]

[1]Department of Computer Science, Yangtze University, Jingzhou, China
[2]Department of Computer Science, Shanghai Maritime University, Shanghai, China
[3]Department of Information Technology and Information Management, Shanghai Ocean University, Shanghai, China

*Corresponding author: iamandy666@outlook.com

Abstract:

With the development of the times, the country attaches increasing importance to the dissemination of historical culture, and the technology innovation museum is one of the important research topics today. Researchers use multiple technologies to establish connections between ancient artifacts and modern people, promoting the dissemination of culture and knowledge. However, there are gaps and a lack of unified understanding in the research of interactive issues. Therefore, this article collects multiple technical data with museums as the theme, systematically summarizes and analyzes the data, calculates and simulates the communication between ancient and modern people, and ultimately creates a set of simulated ancient dialogue experience projects with the theme of "Dialogue with Tang Dynasty Poets", filling the gap in dialogue interaction between ancient and modern characters.

Keywords:. Museum; interaction; dialogue historic figures simulation.

1. Introduction

With the rapid development of technology and the economy in China in recent years, some museums can no longer meet the expectation of the visitors. There is a trend of using advanced technologies in the cultural education and dissemination across new museums throughout the country [1]. The innovation of VR technology, AR technology, and 3D modeling technology endows museums with new exhibition forms and promotional methods, bringing visitors a rich interactive experience. The main purpose of this article is to expand and broaden on the basis of existing science and technology, not only let cultural relics stay relevant, but also bring back the historical figures and their stories to the modern culture conscience.

2. Museum Interaction Project

2.1 Research on Modern Museum Technology

Modern museums are blooming all over the world. In response to the obligation and need for cultural inheritance, the government has effectively invested in multiple programs and information technologies in major cities across the country based on geographical environment and cultural history. For example, in

the Dahe Village Site Museum in Zhengzhou, VR technology not only allows visitors to observe with their eyes, but also allows them to "cross" the glass boundary and more intuitively understand the knowledge and information of the exhibits. Through the cooperation of VR glasses and controllers, visitors can see the living scenes of the ancestors in Dahe Village. The museum has launched research courses such as exploration tours, archaeological experiences, drilling wood to make fire, and where houses come from, and developed a series of cultural and creative products. It has become a "social classroom" for modern people, allowing visitors to appreciate the vast and profound Yangshao culture in a visible, perceptible, accessible, and tangible way [2]; In the Mogao Grottoes of Dunhuang scenic area, AR technology makes virtual reality overlap, making the "flying miracle" reappear in the world. Based on VR technology for 1:1 high-precision three-dimensional restoration of cave murals, AR technology breaks the traditional dilemma of single and boring cultural tourism, allowing ancient civilization to transcend thousands of years and present itself to visitors in a more vivid and vivid form, injecting tremendous vitality into the tourism industry and culture, and promoting the digital transformation and upgrading of scenic spots [3]; In the National Museum, high-precision 3D scanning and modeling digitized exhibits, perfectly reproduce the physical exhibition in virtual space, bringing unprecedented experiences to the world. Visitors interact with exhibits through gesture recognition, voice interaction, and other methods to gain a deeper understanding of the details and characteristics of the exhibits. Integrating innovative technologies into more areas of museum development [4]. The progress of museums in the field of cultural relics viewing is amazing, but in terms of interactive experiences with people, it is not satisfactory. Despite having advanced technology, in order to achieve interactive activities, multiple technologies must be integrated and developed, calculating and simulating the experience process, and creating highly feasible interactive projects.

2.2 Purpose of Museum Project

In order to increase the interactivity, entertainment, and educational value of museum browsing. The group utilizes AI big data models (similar to ChatGPT) to achieve face-to-face interaction and communication with historical figures of the Tang Dynasty, such as Li Bai, Du Fu, and Wang Changling. Centered around them, utilizing speech recognition technology and AI intelligent chat models, visitors can ask questions to virtual characters, receive personalized poetry responses, and engage in a series of interactive entertainment activities with poets, achieving an enchanted experience, promoting the development of interactive experiences and cultural inheritance. To achieve the project objectives.

2.3 The process of carrying out museum projects

The paper has collected information on three poets from the prosperous Tang Dynasty, Li Bai, Du Fu, and Wang Changling, with historic figures as the core. After research, the team found that there are few interactive activities with history as the theme in the market, and there is a lack of precedence to refer to. Therefore, in order to attract the audience, the team will set the project in a history museum or a "pop-up" type of history-related exhibition to attract players and increase project flexibility [5]. Referring to a large number of existing technological cases, such as immersive experience games like "The Vanished Pharaoh" and "Age of Life", the team concluded the three major advantages of these large space immersive exploration projects: 1. Engaging storytelling techniques: using a combination of linear and non-linear methods to provide the audience with sufficient immersion; 2. Innovative interactive settings: lifting the spatial limitations of VR technology, highlighting the entertainment value of performance and the audience's curiosity; 3. Exquisite and meticulous business operation strategy: controlling personnel costs and venue utilization, creating new performance business models. The group establishes the development policy of "content+technology", analyzes and formulates reasonable process planning, discusses and communicates, and completes the project's progress [6].

2.4 Museum project process

At the beginning of the project, wear VR glasses equipment. Play a promotional video featuring the rich culture of the Tang Dynasty in front of visitors using VR glasses, attracting their attention and providing an immersive experience. After the promotional video is played, the scene in front of visitors will quickly transform into a 3D modeling technology constructed ink landscape painting, adding artistic beauty to the painting. Enhance visual and emotional resonance; Using ink and water colors to depict the Eastern artistic conception, creating a lively and dynamic atmosphere; Make the picture stand out, add visual impact, and showcase the beauty of motion. Following closely behind are the three selection keys that pop up, corresponding to Li Bai, Du Fu, and Wang Changling. VR glasses use RGB cameras, motion recognition software, and processors to recognize users' head and hand movements. Firstly, RGB cameras are used to capture user actions, while motion recognition software is responsible for

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analyzing these action data to achieve recognition of user actions. The processor is responsible for processing this data to ensure accuracy and real-time recognition. Different VR glasses products may have different technological implementations, but generally work around these core components [7].Morimoto can recognize the movements of both hands of users at a speed of 120 frames per second, and Storm Magic Mirror can track 22 key points of the hands in real time, both of which can perfectly reflect the hand movements in virtual reality [8]. After determining the options, the poet image that the visitors want to interact with will appear in front of them, which can facilitate smooth communication with the visitors and promote the progress of the project. Character shaping is the core of the entire museum interactive project and requires the most attention. Based on the immersive, interactive, and entertaining environment created by VR technology [9], combined with collected data and referring to existing film and television works, cleverly designed character models using 3D modeling to highlight ancient style characteristics. By using AI big data models with super large scale parameters (usually over one billion) and complex computing structures, starting from two aspects: AI intelligent chat models and AI social character creation capabilities, the traditional clothing characteristics and features collected from Tang Dynasty culture will be fed back onto the model, such as the virtual VR chat room in VRChat, where users can change the appearance model, also known as "skin". Secondly, it is necessary to enhance natural language processing and real-time interaction capabilities. For example, the functions in the Doubao and Maobox apps can be customized to shape the image of historic figures through voice, image, scene, story background, and character settings. With the unique actions of the model, it can complete Q&A interactions with visitors. At the same time, in order to respond more accurately to user needs, a 3D motion capture system is essential. This technology generates the spatial position of the human body or object at a certain moment through the information captured by the motion. Accurately presenting the rich expressions of historic figures when speaking, adding actions such as clapping hands and stroking beards, so that virtual characters cannot remain indifferent in the dialogue like standing on a stake, adding liveliness and vividness.

In addition to basic poetry, small talk, and conversation, the group hopes to allow visitors to experience the cultural charm of Tang Dynasty poets through more interactive activities. (1) Archery: The birth of VR motion sensing technology allows people to break free from the constraints of feather arrows and real bows. Through the virtual reality presented by VR glasses, visitors can freely adjust the ancient background, martial arts performance, and hunting grounds they want. Through 3D modeling and realistic scenes, visitors can immerse themselves in archery and hunting with Tang Dynasty poets. With prop bows and arrows, visitors can experience shooting sports from different angles in this limited space [10]. It is both beneficial to the body and interesting, and can effectively reduce the stereotype of museums being "boring". (2) Chess: In today's advanced technological era, playing chess with AI robots is no longer uncommon, but the experience of playing chess with historic figures wearing VR glasses is little known. On the basis of AI intelligent chess technology, VR technology is added to play chess and game with historic figures. AI robots will also divide the difficulty level from beginner to master, meeting the requirements of multiple visitors. In the process of project implementation, in order to better promote the activity process and enhance the fresh experience, the group used the ancient Chinese translation system. The dialogue between virtual characters will be full of ancient literature, but this will enrich the content, but the effect on the experience is not necessarily good. Therefore, the language system similar to ERNIE Bot will be used to sort out and translate, so as to better help everyone participate in the activities.

2.5 Advantages of Museum Projects

In the era of developing and updating many museum facilities, exploring and seizing new international markets is the main advantage of simulating and developing new museum interactive projects. Compared to others, the advantages of interactive technology are mainly reflected in three aspects: enhancing visitor interest, enriching spatial display, and exploring the connotation of cultural relics. Through outstanding interactive experiences, participants can not only delve into Chinese history, but also enjoy immersive virtual dialogues that are vivid and original, filling the gap in cultural interaction in museums, opening up a spacious track, and paving the way for future forms of museum tourism, laying a solid foundation.

3. Outlook of the application

By wearing VR glasses, visitors can travel through time and space, interact face-to-face with historic figures, and have unprecedented experiences. Virtual historic figures use digital technology to create and enrich their details as much as possible, writing the wisdom and charm of distant ancient sages. What appears in front of visitors is no longer just a cold image, but a true understanding of others like friends, and dialogue with them, allowing visitors to understand their lives through communication with them. The core of interaction lies in using images to convey cultural information with entertainment and edu-

cational value. In practical applications, VR technology is integrated with intelligent chat, virtual chat rooms, and other technologies to create a spectacle of collision between modern and historic figures' thoughts [11]. The new museum interactive project represents not only an innovative form of media communication, but also a cross-era scientific development and technological advancement in the new situation.

4. Conclusion

This study found that museums in various regions of China revolve around the direction of "cultural relics and historic figures", utilizing modern technology to achieve the soaring and dissemination of historical culture. However, there are significant gaps in interactive aspects, such as "dialogue between ancient and modern literati," which can be explained by the following facts. Firstly, the market value of the ancient and modern dialogues in museums is not significant, and the cost-effectiveness of project development is not high; Secondly, the country lacks experience in the interactive development of 3D virtual images, making it difficult to promote implementation; The final dialogue between ancient and modern times requires a huge amount of technical resources to support, and its operation and development are extremely difficult. This study collects a large number of technical cases with museums as the theme, scientifically calculates and simulates feasible project processes, and combines multiple existing technologies to create a theme project of "Dialogue with Tang Dynasty Poets", further promoting historical and cultural dissemination.

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