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DIGITAL PRESERVATION AND REVITALIZATION METHODS FOR TRADITIONAL CHINESE ARCHITECTURAL ENVIRONMENT

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This paper presents the results of research on digital methods for preserving, reproducing, and disseminating traditional Chinese architectural culture. As an integral part of China's ancient cultural heritage, traditional Chinese architecture is widely renowned and studied for its unique architectural styles and techniques. However, over time and due to environmental changes, many traditional Chinese buildings have gradually deteriorated or face the threat of destruction. This article explores the necessity and significance of digital technologies in the preservation, reproduction, and revitalization of China's traditional architectural culture, while also proposing new ideas and methods for more effectively aiding in the protection of historical architectural heritage.

Keywords: *traditional Chinese architecture, architectural culture, digital technologies, revitalization*

INTRODUCTION

In this modern era, methods for preserving, revitalizing, and disseminating traditional Chinese architectural culture are constantly evolving and expanding. The utilization of digital technologies has enabled the reproduction and dissemination of traditional Chinese architecture through a wider range of channels and mediums. Through virtual reality, digital modeling, online platforms, and other means, individuals can gain a more intuitive understanding of traditional Chinese architecture, experiencing its charm and immersion without the need for physical presence. Digital technologies offer enhanced capabilities in reproducing and disseminating traditional Chinese architectural culture.

Firstly, digitization can aid in the protection of traditional architecture by providing more accurate and comprehensive architectural information about structures and the cultures they embody.

Secondly, architectural conservation and restoration can be facilitated through digital technologies to preserve the original appearance and historical characteristics of buildings. Thirdly, digital platforms can be utilized to promote traditional architectural culture, allowing more people to understand and appreciate it, thereby contributing to cultural heritage preservation and rural revitalization efforts. By integrating with the digital age, traditional architectural design can be



rejuvenated, fostering integration with digital technologies and providing new directions for the inheritance of history and culture in traditional Chinese villages.

PURPOSE

This paper aims to identify methods for preserving, revitalizing, and disseminating traditional Chinese architectural culture using digital technologies.

RESULTS AND DISCUSSION

Text Digital reproduction of traditional Chinese architecture, through mapping, 3D scanning, remote sensing imagery and other technologies to accurately measure and record traditional buildings, and then use 3D modelling software to convert the mapping data into a 3D model of the building, these digital models can be used as an important archive of the architectural heritage, preserving the original appearance of the building and its details, in order to prevent the loss of data caused by the building's destruction or loss. The creation of digital models can also provide an important reference and basis in the restoration or reconstruction of traditional buildings, and the use of virtual reality technology allows people to experience the building in a virtual environment, and ultimately to carry out the actual restoration and reconstruction of the building based on the results of modelling and simulation.

The digitisation of traditional Chinese architecture now has important applications in the construction of digital cities, interior design work, tourism teaching, real estate animation and other aspects. In addition, digital virtual in China's traditional architecture and cultural protection has also produced an important role, which is the most prominent is the use of digital virtual technology means, so that the specific study of China's ancient architecture has been further deepened, the traditional architecture of the restoration, repair, protection and demonstration of the reference data and so on is also more rich and reliable in the in-depth study of the structure of the traditional architecture, materials, technology, etc., to provide a wealth of data and information for the researchers [2]. In the in-depth study of the structure, materials and technology of traditional buildings, it provides rich data and information for researchers [2]. At the same time, it provides rich reference and information for designers to incorporate the elements and concepts of traditional architecture into the design of modern built environment to create unique and attractive design works.



Fig. 1. Digital modelling and simulation: Ping Shan Village in Huizhou
-- Shu Guangyu Hall



The development of the media for the traditional scenic spots online digital display provides a brand new opportunity, looking at the whole country, Dunhuang Mogao Grottoes digital construction is more mature, through the official website to browse can get high-definition Mogao Grottoes cultural relics pictures and text explanations, combined with the three-dimensional effect, the audience can get a full range of dead-angle-free browsing [3].

Located in the south of China's Anhui Province, hence the name Huizhou, Huizhou architecture, also known as the Huizhou School of Architecture, is one of the most important representatives of traditional Chinese architecture, the Huizhou School of Architecture is a blend of southern and northern architectural features, both the charm of the ancient town of the water towns, but also the momentum of the courtyard and the palace. They all share the characteristics of traditional Chinese architecture, focusing on harmony with nature, function and aesthetics, and emphasising the integration of traditional culture [4].

By increasing the digital development of Huizhou architecture, the parts of the village that are open to the public are digitally captured and synthesised into a three-dimensional effect to form a digital exhibition hall, i.e., "Digital Huizhou", which allows the audience to browse the internal structure of Huizhou architecture on mobile platforms and web pages. The uniqueness of Huizhou's architectural culture lies in the exquisite architectural features of the residential buildings, the architectural wisdom and the traditional residential life inside. Compared to the Forbidden City and the Dunhuang Mogao Grottoes, which focus on the display of cultural relics, "Digital Huizhou" needs to highlight its own characteristics, show the architectural features and architectural wisdom while reproducing the actual scene, and introduce the cultural connotations of Huizhou carried by the Huizhou architecture by combining virtual compositions and texts, such as: ancestral halls, mansions, and upstairs halls of the dry-rail architectural pattern; For example: the dry-structure pattern of ancestral halls, mansions and upstairs halls; architectural features such as horse-head walls, patios and door covers; the art of Huizhou woodcarving, brick carving, stone carving and bamboo carving; and the humanistic features such as Huizhou merchants, Xin'an School of Painting, Xin'an Medicine and Huizhou Opera, etc. While stimulating the interest of the audience, it also conveys more knowledge and cultural connotations dependent on the Huizhou architecture.

Digital technology offers new avenues for the dissemination of traditional architecture, facilitating access to 3D models through online platforms and mobile applications. This not only fosters greater understanding and appreciation of traditional architecture but also encourages active participation in its preservation and inheritance. Additionally, digital representations contribute to the cultural tourism industry, offering virtual tours and exhibitions that enrich visitor experiences and promote cultural heritage. Digital reproduction and dissemination play a vital role in preserving, studying, and promoting traditional Chinese architecture. By leveraging technological advancements, we can ensure the conservation and inheritance of our architectural heritage while fostering greater appreciation and engagement with traditional cultural treasures.



CONCLUSIONS

Through digital reproduction and dissemination, the cultural and aesthetic value of traditional Chinese architectural culture gains broader recognition, making a significant contribution to the development of global architectural culture. Digital reproduction and dissemination of traditional Chinese architectural culture not only serve as a legacy and safeguard of traditional culture but also serve as a powerful impetus for the application and development of digital technologies. With the aid of digital technologies, we can better understand and propagate the cultural value of traditional Chinese architecture, thereby making a greater contribution to the preservation and inheritance of traditional architecture.

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СЮЕ М., БУЛГАКОВА Т.

ЦИФРОВІ МЕТОДИ ЗБЕРЕЖЕННЯ ТА РЕВІТАЛІЗАЦІЇ ТРАДИЦІЙНОГО КИТАЙСЬКОГО АРХІТЕКТУРНОГО СЕРЕДОВИЩА

У цій статті представлено результати дослідження цифрових методів збереження, відтворення та поширення традиційної китайської архітектурної культури. Будучи невід'ємною частиною давньої культурної спадщини Китаю, традиційна китайська архітектура широко відома та вивчається завдяки своїм унікальним архітектурним стилям і технікам. Проте з часом і через зміни навколишнього середовища багато традиційних китайських будівель поступово занепали або опинилися під загрозою знищення. У цій статті досліджується необхідність і значення цифрових технологій у збереженні, відтворенні та відродженні традиційної архітектурної культури Китаю, а також пропонуються нові ідеї та методи для більш ефективної допомоги в захисті історичної архітектурної спадщини.

Ключові слова: *традиційна китайська архітектура, архітектурна культура, цифрові технології, ревіталізація.*