

The Application of Serious Games in the Conservation of Vernacular Architectural Heritage: The Case of Blue House

Zitan Feng

*Department of Art and Design, The Hang Seng University of Hong Kong, Hong Kong, China
Dou12111@outlook.com*

Abstract. As UNESCO's cultural heritage protection philosophy shifts from monumental architecture to traditional living architecture, the preservation of vernacular architectural heritage has received increasing attention. Nevertheless, it is still in trouble at present. The paper utilizes textual analysis and fieldwork to examine the situation of present vernacular architectural heritage preservation, serious games, and issues and solutions associated with conservation of the vernacular residential cultural heritage buildings. The research confers that preservation of the vernacular architectural heritage is still focused on the heritage itself and there is relatively lack of protection of the collective memories and cultural spirit that is contained within such heritage. The present paper suggests a vision of the serious games incorporating the concept of heritage awareness and cultural experience. The study results indicate that serious games can not only break the time and space restrictions and safeguard the privacy of the residents, but also address the flaws in memory passing and emotional bonding. The research offers a new direction of the ongoing preservation of the vernacular architecture in the digital era and contributes to the innovative methods to the designing of the further cultural serious game narratives.

Keywords: vernacular architectural heritage protection, cultural heritage digitization, serious games, collective memory.

1. Introduction

Since the 1970s, UNESCO's philosophy on the protection of cultural heritage buildings has undergone a significant shift, with vernacular architectural heritage gaining increasing attention. The creation of digital technology has sparked the demand to utilize it in safeguarding cultural heritage, and serious games, as a digital platform that offers both educational and entertainment, represent one of the available avenues to achieve it.

The research design that will be used in this study is qualitative research which aims at exploring how vernacular architectural heritage in the digital era is being preserved with the help of serious games. To balance the theory and practice, text analysis and fieldwork is employed in this paper.

It has been discovered that the vernacular architectural heritage is poorly safeguarded all over the world. The buildings of these grand cultural heritage are still the victims of the natural forces and human actions. This harm is not just the physical destruction but it is also the collective memory loss. But in the case of cultural heritage that is being kept in the village setting, old towns or in the

village architecture, it is the way of life and historical reminders that are the most important. The designs of existing serious games are mostly aimed at replicating particular historical periods, time, scenes or processes, or popularizing knowledge with regards to particular intangible cultural heritage, which, however, do not effectively safeguard the concept of intangible cultural heritage with any feeling of cosiness, including collective memory and customs. Stakeholders being the rather the practitioners of the cultural memory and the bearers of traditional lifestyles, play a crucial role in the conservation of vernacular heritage buildings, which represent some of the traditional lifestyles.

Relying on that, the proposed research seeks to examine how novel narratives of serious games maintain the genuine character of living heritage e.g. lifestyles and cultural memories of vernacular architecture location and the relevance of such a digital preservation measure. The originality of this research is to create a new design in games. Using the oral history and other sounds collection through the streets in the narrative design. This study enhances the narrative of the game in terms of richness and authenticity, therefore ensuring and sustaining the memory and culture of the past in the digital world.

2. Literature review

2.1. The evolution of architectural heritage conservation concepts

Over the past 80 years, UNESCO's concept of protecting cultural heritage buildings has gradually changed, shifting from monumental buildings to vernacular architecture. Prior to the 1960s, architectural heritage protection mainly referred to the seat of monarchy and heritage of religious interest. Until 1976, Recommendation concerning the Safeguarding and Contemporary Role of Historic Areas explicitly emphasized that "historic areas" with Outstanding Universal Value (OUV) should be protected. From then on, people's understanding of the protection of architectural heritage began to change. In 1987, Charter for the Conservation of Historic Towns and Urban Areas adopted by ICOMOS further consolidated the concept of protecting residential areas that embody traditional lifestyles. Since 1990, more and more traditional dwellings, villages and ancient towns were listed in the World Heritage List.

Authenticity is a rather popular notion in relation to architectural heritage conservation that defines historical context and certain value. Authenticity has both the tangibles and the intangibles. In one of the Nara, Japan, in 1994, the Nara Document on Authenticity highlights some of the basic signals of authenticity. According to the document, the authenticity includes form and design, materials, physical objects, purpose and functionality, tradition and craftsmanship, location and environment, spirit and feeling and other internal and external influences. The Akagawa discussion suggested that the definition of the authenticity of architectural heritage must also be conducted in the framework that takes into consideration the local cultural traditions, spiritual implications, and natural surroundings [1]. This was the agreement of Prinzleve, J. who proposed that cultural memory communities could result in emotional reactions like pride, awe or belongingness [2]. In the works of Chen and Lu, we found confirmation of the importance of collective memory to the transformation of the city and the progress of the city-related history [3].

2.2. Application of serious games in cultural heritage protection

The concept of serious games was first proposed in 1929 by American educator and sociologist Clark C. Abt in his pioneering research. He clarified that the main purpose of serious games is to go

beyond mere entertainment in order to achieve carefully planned educational goals [4]. In the past 40 years, serious games have been applied in many fields such as health, military, medicine, education and government [5]. Since the 21st century, with the increasing attention paid to cultural heritage by all sectors of society and the continuous improvement of the development and application of serious games, serious games have been gradually applied to cultural heritage protection and education.

Currently, several serious games that use AR/VR and other technologies to popularize historical and cultural knowledge have been applied in museums around the world, such as the Leeds City Museum and the Weston Park Museum. deSousa, R.R.A. proposed that digital tools broaden the possibilities of research and enrich understanding of the past by providing resources for the organization, analysis, visualization and interpretation of historical data [6]. In the digitization of cultural heritage, serious games have played an important role in the cognition and protection of cultural heritage due to their advantages such as interactivity, competitiveness, fun, personalization and evaluation feedback [7].

Michela Mortara et al. created a path in 2014 by proving the usefulness of serious games as a tool of cultural heritage education. By eliminating 51 major cases they categorized serious games connected with cultural heritage into three groups, namely: Culture Experiential, Historical Reconstruction, and Heritage Awareness [8]. The mode of immersive exploration is frequently used in Heritage Awareness so that the presence of the players is more implemented to reinforce their knowledge of the connotations of cultural heritage and make them feel the inspiration to take an interest in cultural heritage protection. The purpose of the so-called historical Reconstruction is to reproduce certain periods in history, events, scenes, or processes. Role-playing and other forms of participation in particular historical processes allow the players to better understand their contents and importance. Cultural Experience games are mainly utilized in safeguarding the intangible cultural heritage. Through the creation of the scenes, simulation of movement, and puzzle solving, these games enable participants to feel life as lived in forms of culture customs: traditional customs, folk tales as well as celebrations.

3. Discussion

3.1. Current status and challenges of vernacular architectural heritage protection

Vernacular architectural heritage is more difficult to protect than monumental structures such as the seat of monarchy and heritage of religious interest. Its current state of preservation is also far from optimistic. There are three main reasons for this. First, vernacular buildings were not originally very sturdy. Because vernacular buildings were constructed by working people as dwellings, their social class and economic circumstances meant that expensive and robust building materials were generally not used from the outset. Secondly, vernacular buildings may be damaged, destroyed, or ruined by social changes and natural disasters throughout history. Thirdly, vernacular buildings have received attention and protection from cultural heritage organizations relatively late. After 1970s, UNESCO started to recognize the cultural heritage value and status of vernacular buildings.

At present, the protection of vernacular architectural heritage focuses more on the location, appearance, materials, and uses of heritage buildings, while the protection of their spiritual connotations and cultural customs is relatively lacking. This study finds that most literature on vernacular architectural heritage protection focuses on the application of advanced artifact restoration techniques or digital technologies to the preservation of the buildings themselves. Removing the building as far as possible it can preserve the building as a real witness of

development of history or as a technological innovation and emphasize the historical and architectural importance of building. The most utilized method of maintaining cultural memory is oral history. It is however normally employed to go against colonial culture or as a way of sealing gaps in history. In the meantime, the literature devoted to cultural preservation should be more attentive to the things that are less obvious like the cultural memory and traditions of its people.

3.2. The conservation status of blue house and the design of serious games

Blue House is a grade one historic building in Hong Kong. Following community-based conservation efforts, both Blue House as a community and its nearby neighborhoods constitute a cultural heritage community that merges the day-to-day life activities and cultural and artistic activities. Blue House is an effective model of vernacular residential preservation thus this study adopts it as a case study to use the concept of serious games to understand how it could be applied in the preservation of vernacular architectural heritage.

In order to achieve a more realistic and objective research, the paper has used a Fieldwork to explore the target case, Blue House. The initial phase of the field work was to visit Blue House and the surrounding area in deciding on how well it is being preserved and revitalized as a culture heritage site. The second challenge is to monitor the attitude of stakeholders to the visitors and determine what innovative design features of serious games and their importance to the preservation of Blue House. The three months observation was based on the staff members of Hong Kong House of stories, the volunteer of the flea market and the residents who came to relax in the blue house courtyard.

3.2.1. Conflict between residential function and cultural openness

Cultural heritage sites are social areas where visitors come in to receive history and culture [2]. The cultural preservation project of Blue House has however maintained its traditional role of a residential house. This has affected its transparency in a negative manner. Today, a composite of Blue House and the neighboring areas has established a cultural heritage community that combines both the normal-day life functions with the cultural and artistic functions. On the one hand, because it is a home, Blue House offers a permanent and consistent location to the initial inhabitants and tenants. Conversely, due to its status as a cultural relic, Blue House is a tourist destination that is frequented by most local and foreign tourists. Also aside the guided tours, the Blue house has the Hong Kong house of stories situated on the first floor that exhibits a collection of old stuff. Moreover, the street-facing rooms have different distinct restaurants and bars where people can relax and have meals.

Fieldwork revealed that, as a multifunctional space, Blue House residents pay more attention to its residential function. The stakeholders have made great efforts to protect residents' privacy and maintain the daily operation. Firstly, the living areas have been protected, except the first floor. Visitors without authorization can only visit the shops and courtyard. Furthermore, Hong Kong House of Stories as the main public space for telling the story of tenement building living, suffers from significant questions, including outdated facilities, insufficient narrative, limited and non-touchable exhibits, and a lack of diverse merchandise. The staff there were not very welcoming to visitors. Not far from the Hong Kong House of Stories is a charity flea market, with some of the volunteer staff being residents. They are happy to sell their items to raise funds for Blue House's maintenance. Therefore, their attitude towards buyers is similar to that towards micro-sponsors. Blue House residents, on the other hand, are more wary of visitors. During filming, an elderly person

resting in the courtyard reminded visitors not to record. Filming is only permitted with the consent of nearby residents.

3.2.2. Narrative design for memory transmission in serious games

Based on the above issues, this study proposed a concept for related serious games. Taking Blue House as an example, the serious games designed are centered on protecting collective memory and customs. Therefore, combining heritage awareness games and cultural experience games are more suitable for the development of Blue House serious games [7].

Following the common framework for serious games, the design of a Blue House-themed game would incorporate key elements such as learning objectives, game narrative, mechanics, user interface, user experience, and evaluation [9]. The ideas proposed in this study are mainly in terms of game mechanic and narrative. In order to create a sense of memory rupture, thereby reinforcing the awareness of the crisis of cultural loss. The game is set 500 years later, where an expedition arrives at Blue House in search of treasure. Players will take on the role of explorers, entering Blue House to search for hidden treasures within its ancient ruins. These treasures are items that hold memories. Upon triggering an item, players will interact with its owner, using system hints to help the owner recover lost memories or reshape the item. Players can also participate in various festival events, such as the Obon festival.

Specifically, the narrative will be built using materials gathered through oral histories and street sound recordings. These sources reveal the lived memories and traditional customs of local residents. The organizer of the game development cooperated with St. James' Settlement, the operating organization of Blue House, to issue a volunteer notice to the residents, encouraging everyone to "donate" a story about themselves and Blue House. When conducting interviews, the interviewer will ask the interviewee "What kind of tenement building do you want the future to know?" This kind of questioning will effectively enhance the interviewee's sense of immersion, responsibility and historical honor [10]. An example is of a corner table constructed on wood of the stair next to the courtyard as a book sharing corner. Books that have been read and are desired by people are placed on it. This is probably a habit that was inherited out of the sharing that occurred among the neighbors when there was a lack of some. The interviewees will be able to show the kind nature of mutual assistance to each other by telling how they feel about this special kind of sharing.

Street sounds as a component of the urban soundscape are a significant sense dimension, and as a part of the local memory. Hence, it is also possible to capture and use numerous sounds that are gathered on the street to make the game richer with Hongkong-related elements.

4. The significance and value of serious games in vernacular architectural heritage

Due to the conflict between the privacy of the residential function and the openness of the cultural and artistic function in vernacular architectural heritage, serious games are very suitable for the preservation of cultural heritage such as Blue House, which are revitalized and still serve as residences.

Cultural heritage provides communities, groups and individuals with a sense of identity and continuity, helps them envision their world and gives meaning to their shared way of life [11]. The living layout of tenement buildings is relatively compact, and the neighbors were living together like a family. Blue House inherits the hometown memories and life wisdom of the lower and middle classes of Hong Kong, showing the neighborly affection of mutual care during difficult times, conveying the warm memories that an old building as a "home" brings to people, and also

embodying the belief that "after hardship comes happiness and life will eventually get better" that the hardworking people always uphold [12]. This is the practical significance of the existence of Blue House and its important value as cultural heritage.

Currently, visitors' understanding of tenement buildings is limited to exterior tours, guided tours, pictures, and textual explanations. This approach offers little help in shaping the cultural narrative of residential architecture. It neither enhances visitors' understanding of the building's structure nor helps them experience the "co-living" lifestyle and the belief that "life will get better".

The application of serious games in the preservation of vernacular architectural heritage can effectively address the above issues. On the one hand, digital methods break down the limitations of space and time, fully protecting residents' privacy and improving their safety. On the other hand, serious games have the potential to enhance historical and cultural narratives. This feature can effectively compensate for Blue House's shortcomings in terms of openness to visitors, historical narrative, and emotional and spiritual transmission. Furthermore, such innovative design can enhance the community's sense of participation in cultural heritage preservation.

This study innovated in the narrative part of the game by using oral history and street voice collection. In 2009, the theme of the Oral History Society was "Voices in Oral History". The concept of "spatial story" proposed by Michel de Certeau has resonated in various disciplines. The memory landscape is a fusion of space and time. Places are not just points on a map, but also exist in time [13]. Therefore, the inclusion of oral history in the digital space promotes the spatial narrative of cultural heritage and the preservation of memory and emotion. Street sounds with distinctiveness and representativeness are an important part of Hong Kong life. Using these sounds in the serious game design not only achieves the goal of soft cultural dissemination but also evokes emotional resonance among Hong Kong people. Therefore, by collecting memories and sounds and combining them with digital games, players can experience the stories that once happened here more directly and realistically.

5. Conclusion

As the concept of cultural heritage protection shifted, villages and antique towns as the vernacular architectural heritage have slowly been seen as an element of systematic protection. Nevertheless, even today in terms of such protection of these buildings the accent is laid more on their physical appearance, without resorting to their customs, recollection and spirit of their cultures. The emergence of digital technology and the use of serious games widely offers efficient ways of coping with these shortfalls.

Thus, based on the example of Blue House, the paper examines how the concept of serious games could be utilized in the maintenance of vernacular structures. The argument of the research is that serious games (with a focus on oral history and local sound recording) can be used efficiently to create the so-called spatial memory and generate living heritage, i.e., the life narratives of community members and their coziness into digital information. This not only overcomes the restrictions of physical space but also secures privacy as well as increases the attractiveness of cultural spreading out. It enables one to feel the emotional worth of the conventional homes and feel the nostalgic living of the anticipation of the better life of the working people, hence the heritage was conveyed online.

This research has a limitation of this type of study since it is only based on a single case study; therefore, its results cannot be generalized to the whole population. With the dynamic times, not many residential buildings can maintain the functions that they once had following conservation and revitalization efforts. Thus, further studies can make serious games more adaptable and sustainable

in the process of maintaining cultural heritage memory by increasing the case study field and building digital memory server.

References

- [1] Milojković, A., Antić, U., Stanojević, A., Jevremović, L., Nikolić, M., Đorđević, I. and Brzaković, M. (2025) Perception of Authenticity of a UNESCO Heritage Site: New Infill Design and Integrity Protection in the Old Town of Ohrid, North Macedonia. *Sustainability*, 17, 2067.
- [2] Prinzleve, J. (2023) Silent Memorylands: City Branding and the Coloniality of Cultural Memory in the Hamburg Hafencity. *Memory Studies*, 16, 984-1002.
- [3] Chen, Y. and Lu, S. (2025) Different Patterns of the Revitalization of Collective Memory in Shanghai and Hong Kong: The Cases of Columbia Circle and Blue House Cluster. *Space and Culture*, 28, 195-220.
- [4] Xu, H.G., Yumeng, G. and Zhang, A. (2024) A Study on Serious Game Design for Cultural Heritage Education. *Art Design Research*, 4, 87-94.
- [5] Hammady, R. and Arnab, S. (2022) Serious Gaming for Behaviour Change: A Systematic Review. *Information*, 13, 142.
- [6] de Sousa, R.R.A. (2023) The Preservation of Historical Memory in The Digital Age: Challenges, Opportunities and Interactive Technologies in Teaching and Research. *Revista Inter-Ação*, 48, 894-915.
- [7] Xu, T., Zhou, K. and Wang, M. (2023) Advances in the Application of Serious Games in Landscape Heritage. *Landscape Architecture*, 30, 51-55.
- [8] Mortara, M., Catalano, C.E., Bellotti, F., Fiucci, G., Houry-Panchetti, M. and Petridis, P. (2014) Learning Cultural Heritage by Serious Games. *Journal of Cultural Heritage*, 15, 318-325.
- [9] Bunt, L., Greeff, J. and Taylor, E. (2024) Enhancing Serious Game Design: Expert-Reviewed, Stakeholder-Centered Framework. *JMIR Serious Games*, 12, e48099.
- [10] High, S. (2010) Telling Stories: A Reflection on Oral History and New Media. *Oral History*, 38, 101-112.
- [11] Mekonnen, H., Bires, Z. and Berhanu, K. (2022) Practices and Challenges of Cultural Heritage Conservation in Historical and Religious Heritage Sites: Evidence from North Shoa Zone, Amhara Region, Ethiopia. *Heritage Science*, 10, 1-22.
- [12] Feng, Z.T. (2025) Innovative Conception for Blue House Digital Exhibition Hall. *Lecture Notes in Education, Arts, Management and Social Science*, 3, 225-232.
- [13] de Certeau, M. (2002) *The Practice of Everyday Life*. University of California Press, Berkeley.