A Thousand Dreams Unbuilt: Navigating Digital Empathy in the Crisis of Unfinished Buildings

Jiahe Zhao, Cheng-Yu Pan
International Intercollegiate Ph.D. Program, Graduate Institute of Art and Technology
National Tsing Hua University, Hsinchu
zhaojhe@163.com, noixdarec@gapp.nthu.edu.tw

Abstract

This study explores the role of art and technology in revealing and addressing social issues arising from urbanization, specifically in the case of unfinished buildings across various cities in China. Through literature review and practical case study of the *A Thousand Dreams Unbuilt* project, the application of 3D scanning, Virtual Reality (VR), and Artificial Intelligence (AI) in understanding and addressing housing issues is analyzed. These technologies not only illustrate the aspirations of the owners of unfinished buildings for ideal living spaces but also evoke a deeper understanding and empathy for their situation. *A Thousand Dreams Unbuilt*, by integrating technology and art, offers attention to marginalized communities while challenging the audience's perception of reality and virtual worlds. This research demonstrates the potential of combining art and technology in promoting social justice and transformation, urging a re-examination of these tools in solving global housing issues.

Keywords

Unfinished Buildings, Virtual Residence, Real Estate, AI-assisted interior design, VR Interactive Experience, 3D Scanning

Introduction

As urbanization accelerates globally, the real estate industry plays a significant role in the economies of many countries. However, this process is not always smooth, and its negative impacts are particularly evident in the phenomenon of unfinished buildings in China. Since 2020, numerous real estate projects have been halted due to developers' financial issues, leaving residents under the dual pressure of paying mortgages and rent, with some even choosing to live in unfinished buildings.[1] This not only highlights the fragility of the real estate market but also touches on significant social issues affecting many families and individuals.

This study explores how technology and art can reveal and address this social phenomenon through literature review, creative work, and field visits. The focus is on how technology, especially 3D scanning, VR, and AI, can represent the desires of the owners of unfinished buildings for ideal living spaces. The aim is to analyze this particular case to explore the role and responsibility of art and technology in modern society. By examining the implementation and feedback of the project, this study shows how art and technology work together on social issues, providing a voice for marginalized groups and challenging the audience's perception of reality and virtual worlds. Through this process, the study seeks to spark broader social concern and discussion about housing issues, promoting reflection and change in existing societal norms and dynamics.

Figure 1. Photos of unfinished buildings, taken in Henan, China, in January 2024.

Related Concepts and Works

Spatial Issue Exploration

David Harvey strongly emphasizes the close interplay between urban space and social structure, revealing that space is not just a physical entity but also a profound reflection of economic and political power relations.[2] Henri Lefebvre's theory of the “social production of space”[3] also elaborates that space is not passively existing but is constantly created and transformed through social practices.

In Neil Stephenson's work *Snow Crash*, he introduced the concept of the "Metaverse."[4] Games like *Minecraft* and *Animal Crossing* provide early examples of virtual living spaces and property rights, offering insights into the virtual and real space relationship. These creations not only demonstrate the limitless possibilities of virtual worlds but also reflect our re-understanding and reconstruction of space in the real world.

Technological applications like ScanLAB's use of 3D scanning technology in contrasting studies of architectural spaces[5], and Oneroom-Babel's VR documentation of individual dwellings and stories[6], demonstrate the immense potential of technology in deeply exploring and understanding space.

A Thousand Dreams Unbuilt also utilizes technologies, delving deeply into the close relationship between people and space by instantly presenting the desires of unfinished building owners for their ideal homes. Furthermore, it explores the future of the metaverse, discussing its potential impact on the current physical real estate landscape and its role as a possible solution to real-world predicaments.

Artistic Interventions: Unveiling Marginalized Voices

In the field of art, attention to social responsibility and human rights, as well as minor revolutions through artistic and technological practices, have become significant forces of social intervention.

For instance, Santiago Sierra's *133 People Dyed Their Hair Gold* involved inviting immigrant street vendors in Venice to dye their hair, embarked on a direct exploration of labor, race, and social marginalization.[7] Bekki Perriman's *The Doorways Project* utilized recorded narratives of the homeless, broadcasting them in their common haunts to highlight these overlooked voices and boost societal awareness.[8] Forensic Architecture's work uses open-source information to analyze human rights violations like elusive aerial violence.[9] *Felix's Room*, a digital mixed-media theater production, recreated the life of Felix and Erna Ganz under Nazi imprisonment through holographic projection and 3D scanning, immersing the audience in a virtual space filled with historical memory and identity challenges.[10] *Displaced Witness*, with its 3D-scanned reconstruction of the Lesvos Island landscape, allows viewers to experience the profound impact of the refugee crisis on social spaces and cultural landscapes, becoming spatial witnesses to this historical event.[11]

A Thousand Dreams Unbuilt follows this artistic trend, aiming to reveal and explore the overlooked marginalized groups in modern urban environments. The project embodies the decentralized characteristics of Haraway's cyborg theory[12], not only exploring territorial and national limitations in virtual spaces but also examining whether decentralization can bring greater freedom and liberation. This experience deconstructs reality and delves into new dimensions of freedom, identity, and space.

A Thousand Dreams Unbuilt

1. Methodology

Initial Preparation and Data Collection

The project initiated with the 3D scanning of unfinished buildings, carefully assessing various techniques before selecting the Lidar camera for its optimal mix of ease, speed, and model fidelity. The scan utilized an iPhone equipped with a Lidar camera and the Scaniverse app to efficiently generate 3D models of the unfinished buildings.

Figure 2. Collected 3D scanning model of an unfinished building.

Preliminary Model Construction

Web-based interior design software was employed to quickly create models from the 3D scans of the unfinished buildings, laying a foundational framework for subsequent interior design discussions.

Resident Visits and Custom Design

Engagement with the unfinished building owners was deepened to grasp their functional planning for each space, furniture dimensions, and layout ideas. Based on these ideals, preliminary setups were created using template furniture in Homestyler software.

After the initial setup, inquiries were made about the residents' design style preferences. Utilizing AI technology, style-transforming commands were applied to the basic furniture layout diagrams, aligning with the residents' preferences. This process transformed the originally simple layouts into multiple sets of unified and aesthetically pleasing interior design plans for selection.

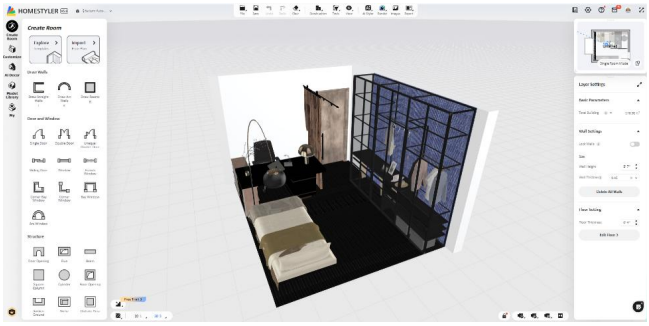

Figure 3. Preliminary setups were made using interior design software's template furniture.

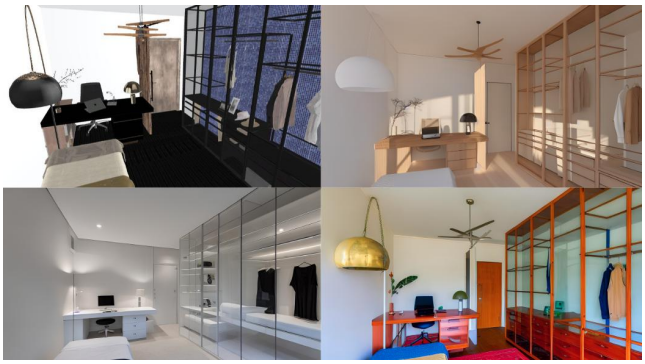

Figure 4. Applied style-transforming commands to the basic furniture layout diagrams.

Detail Adjustment and Confirmation

Once the design style was established, AI tools were used to modify the design diagrams in detail until they fully met the residents' needs.

Thanks to the efficiency of the design software and AI technology, the design steps could be visualized quickly, allowing residents to see the potential changes in their living spaces. This concrete reference helped them express their needs and preferences more clearly.

Moreover, this design process was not a one-way creation but a dynamic, interactive cycle, with each step adjustable based on residents' feedback. Each round of modifications brought the final outcome closer to the residents' ideal living space, ensuring that the final design was not only aesthetically pleasing but also truly aligned with their lifestyles and aesthetics.

Three-Dimensional Scene Construction

Inspired by film effects technologies like Matte Painting and Camera Projection, this stage aimed to efficiently generate exquisite three-dimensional models of ideal living spaces. First, AI applications were used to enhance the clarity of the design diagrams, followed by creating depth maps. Then, these depth maps were restored in Blender, transforming the flat design diagrams into three-dimensional models with depth. On top of the AI-restored three-dimensional models, Blender's editing tools were further used for fine-tuning to ensure the completeness and accuracy of the models. The tight combination of these steps eventually assembled a complete room three-dimensional model.

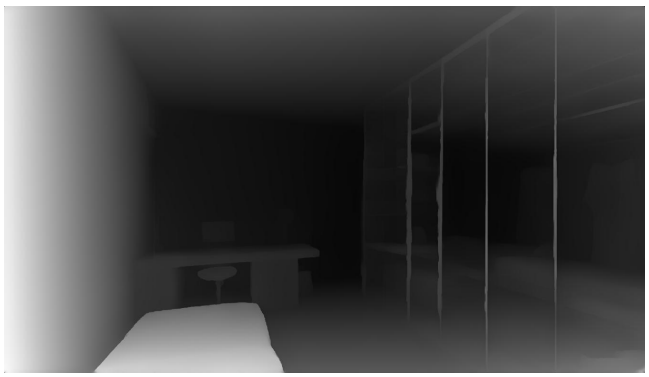

Figure 5. Generating depth maps for various perspectives of the room.

VR Interactive Production

The final work was presented in an immersive, interactive VR format. The exquisite models of the ideal rooms were superimposed on the original 3D scanned real models. Key locations in the room were set up for audio interaction, allowing the audience to hear the residents' interviews about their ideas for ideal living spaces when moving to specific spots in the room. Additionally, gaze interactions were set throughout the house. When the audience gazed at a point for more than 2 seconds, the ideal living space model they were looking at would gradually crumble and become invisible, revealing the real unfinished building's 3D scanned model. When the audience's gaze moved elsewhere, the gaze interaction effect returned to its original state, and the ideal living space model reappeared.

Figure 6. VR gaze interaction. Center of the image reflects the viewer's focus, unveiling the 3D scanned model of the actual building.

2. Case Study: Xiao Mei's Dream Space

Visits were made to various cities in China, where seven families, all caught in the predicament of unfinished building ventures, were met. This article uses the example of Xiao Mei (a pseudonym), an 11-year-old girl, for illustrative analysis. Coming from a rural area in Henan, Xiao Mei's parents moved to Zhengzhou, the provincial capital, to provide her with better educational opportunities,

working as waiters in a relative's restaurant. With most of the family's income consumed by housing loans, they led a very frugal and difficult life.

In designing the room, it was discovered that Xiao Mei's ideas vastly differed from initial expectations. Anticipated was her preference for a whimsical, childlike room; however, she chose a minimalist style, reasoning that such a design would be more suitable for long-term use. Despite suggestions to let imagination run free in the virtual design, she insisted on a practical and durable design. The only hint of a young girl's dream was her wish for a large wardrobe, as most of her current clothes were hand-me-downs from relatives.

Xiao Mei's pragmatic thinking and consideration for the future displayed a maturity beyond her years. Although her ideal living space was simple, it was also neat, bright, and comfortable, starkly contrasting her current rudimentary living conditions. This was more than a story of spatial design; it was a profound reflection on dreams and reality intertwining, where childhood innocence coexists with mature thought.

3. Assessment and Future Development

After completing the exquisite 3D model, it was first shown to Xiao Mei. Experiencing VR technology for the first time, she was delighted by this novel medium, showing happiness while immersed in her virtual ideal home. When asked if she would like to live in a virtual space, she was open to the idea but emphasized the importance of "living with her parents in the virtual world."

The audience's reaction to this interactive piece was multifaceted. They were fascinated by the novelty of virtual technology and simultaneously empathetic towards the owners of the unfinished buildings. Some expressed that the project deepened their comprehension of the residents' actual plight, evoking a sense of heartache.

Regarding the question of whether to live in virtual spaces in the future, some viewers said they were already accustomed to socializing and shopping in the virtual internet world and didn't mind this virtualization becoming more thorough. Others were more reserved. Some parents, concerned about health, preferred to limit their children's exposure to electronic products like VR. Yet, other viewers stated that virtual reality could never replace the warmth of face-to-face human interaction. However, the majority recognized that the realm of physical real estate often presented ongoing concerns, particularly for those who had invested in unfinished buildings or those struggling to afford their own homes.

The future direction of *A Thousand Dreams Unbuilt* is twofold: first, to expand the project to explore various housing issues faced by individuals across different regions, and second, to leverage the resources acquired through the exposure of this project to undertake actions that yield tangible results, truly helping the unfinished building owners and improving their situation.

4. Discussion

The title "A Thousand Dreams Unbuilt" comes from the ancient Chinese poet Du Fu's verse, "How can we build a thousand houses to shelter all from cold," expressing a longing for an ideal society where everyone has a secure place to live. However, despite tremendous technological progress over centuries, why does the housing issue remain a persistent and profound social problem? In some sense, this is not merely a technological issue but a structural problem involving economics, policy, and social values. *A Thousand Dreams Unbuilt* imagines whether virtual technology can bring change and disruption to existing social structures, guiding audiences to consider the complexities and challenges in this process.

In this project, AI not only serves a functional role but also implicitly reflects class contrasts: the initial training sets of AI, containing images of beautiful homes, mirror the affluent lifestyles of some in the real world. It is this contrast that leads us to further contemplate how to maintain human warmth in an era of rapid technological advancement and how to face and solve social issues obscured by technological progress.

Conclusion

By leveraging 3D scanning, VR, and AI technologies, not only were the unfinished building owners' wishes for their ideal homes presented, but also the emotions of the audience were touched, prompting a deeper understanding and empathy towards the owners' situations. This experience provides a new perspective on real-world problems and stimulates profound contemplation on the relationships between reality and virtuality, technology and humanity, and art and social responsibility.

A Thousand Dreams Unbuilt is not just a technological and artistic project but also a social experiment. Through this project, it is observed that while technology and art serve as tools and intermediaries within the social structure, they also hold the potential to ignite social change and personal reflection. This research demonstrates that by combining art and technology, voice and attention can be given to troubled communities, while also encouraging public participation and reflection, promoting social justice and transformation. Ultimately, the case study of *A Thousand Dreams Unbuilt* is perceived not just as an exploration of the unfinished building issue but as a profound reflection on the current global housing problem. This study calls for a reevaluation of the role of technology and art in modern society, particularly their potential in solving and revealing deep-rooted social issues. As Du Fu's poetry suggests, although the ideal of secure and comfortable housing remains elusive, the combination of technology and art might enable us to take a firmer step toward realizing this dream.

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