Searching for Patterns in the Forbidden City

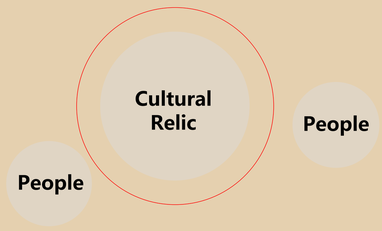
AIGC interactive exploration experience based on the window lattice of the Forbidden City

Yiyu Fang, Zihong Zhao, Vivian Huang, Hongxin Fu

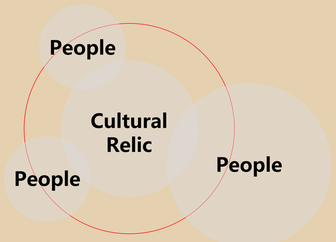
北京師範大學 BEIJING NORMAL UNIVERSITY

未来设计学院 School of Future Design

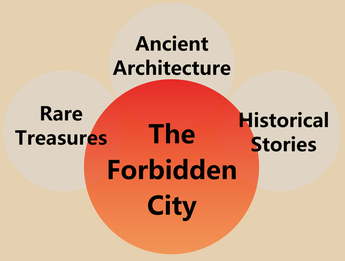
BACKGROUND



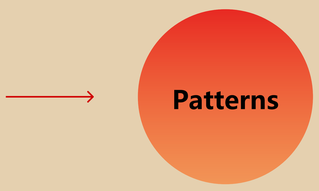
In the past, history museums focused on "objects" and emphasized the collection, protection, and research of cultural relics, giving the public a sense of distance.



The audience actively creates meaning. To transform museums from "authoritative education" to engaging spaces, focus on audience needs and provide practical, engaging learning opportunities.



The Forbidden City has a rich and colorful collection of Chinese cultural content.



The patterns reflect the aesthetics of the times and the real society. The Forbidden City carries the essence of the entire Chinese pattern.



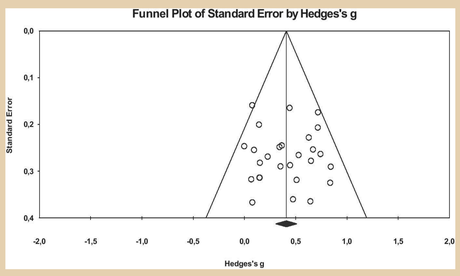
The distinctive window lattice of the Forbidden City are often overlooked. Using digital tools to increase their visibility is a great approach.

WINDOW LATTICE



Window lattices are key elements of traditional Chinese architecture, especially in wooden structures, often serving as the aesthetic focus. In the Forbidden City, the design of doors and windows reflects the status of the room's occupant, with more intricate patterns indicating higher rank. Each window frame embodies cultural concepts of "nothingness," "emptiness," "existence," and "reality."

METHODS

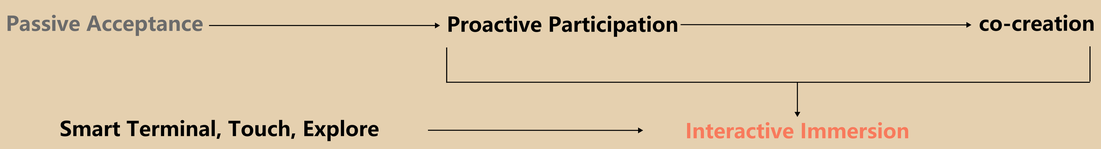


Interactive Experience

Funnel plot graphic indicating the magnitude of the impact of online education on academic success

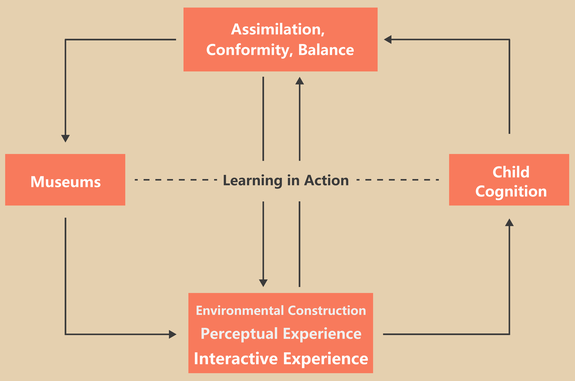
Digital learning utilizes digital tools and technologies for education. **At our events, audiences use AIGC technology to digitally stylize and transform their own photographs**, enhancing the interactive and contemporary nature of learning.

* Ulum, H. The effects of online education on academic success: A meta-analysis study. Educ Inf Technol 27, 429–450 (2022). https://doi.org/10.1007/s10639-021-10740-8



Interactive Experience

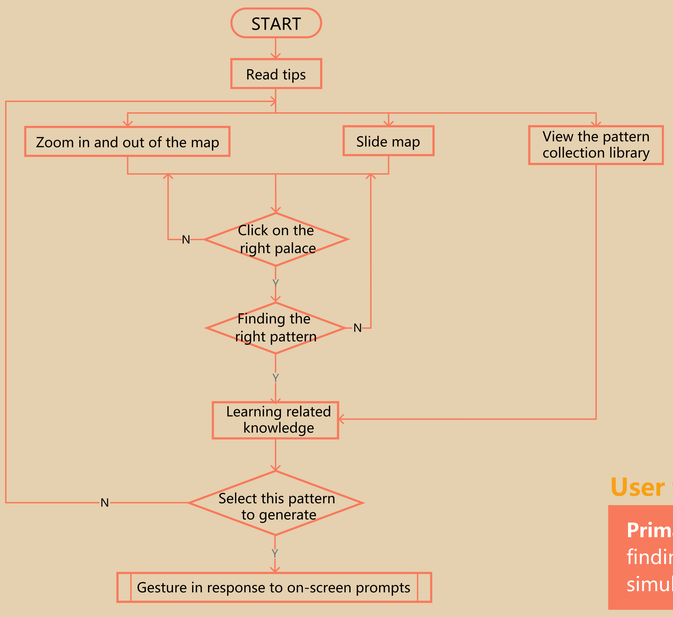
Interactive experience, also called interactive experience, is the interactive experience of human behavior. With the development of new media image technology, the form of art, cultural relics, audience and space in the museum has changed, and the identity and experience of the audience has also changed. Interaction from the traditional passive acceptance, transformed into active participation, and ultimately achieve the effect of co-creation.

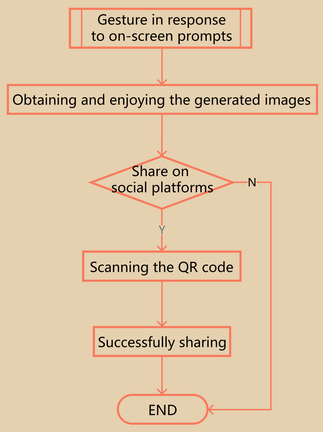


Children's cognitive construction processes in museums

Interactive Experiences and Children's Cognition

Constructivism, proposed by Piaget, believes that children actively construct knowledge through interaction with the environment, and that "learning by doing" is an important feature of this process. Through interactive experience, children gain experience and feedback in solving problems and creating choices, actively constructing knowledge, and completing the cognitive construction process from assimilation to conformity to equilibrium.





User flow chart

Primary behaviors:
finding patterns, learning patterns, simulating patterns, pattern transformation

INNOVATIVENESS

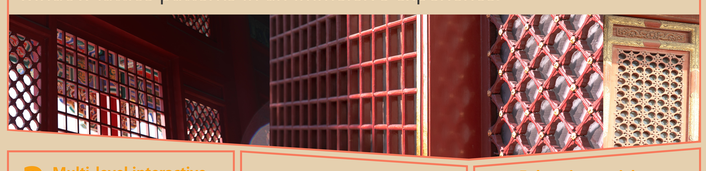
1 Real-time art creation and presentation

Visitors can choose their favorite window pane patterns and blend them with their own photos to generate unique artworks, enhancing engagement and creativity. The generated artwork is immediately displayed on a large screen, allowing visitors to instantly see the results of their creations, increasing their sense of accomplishment and satisfaction.



2 Multi-dimensional cultural presentation

Through the graphic prompts provided by the interactive screen, visitors can not only see the high-definition image of the pattern, but also understand the historical story and cultural background behind it, increasing the depth and breadth of cultural knowledge. The multi-dimensional cultural display allows visitors to gain a deeper understanding of the artistic and historical value of the Forbidden City's window lattice patterns in an immersive experience.



3 Multi-level interactive experience

Multiple interactive sessions, from pattern finding to photo fusion to real-time display, are designed to maintain visitor interest and engagement, providing a dynamic experience. Each interaction level builds progressively, enhancing coherence and user experience richness.

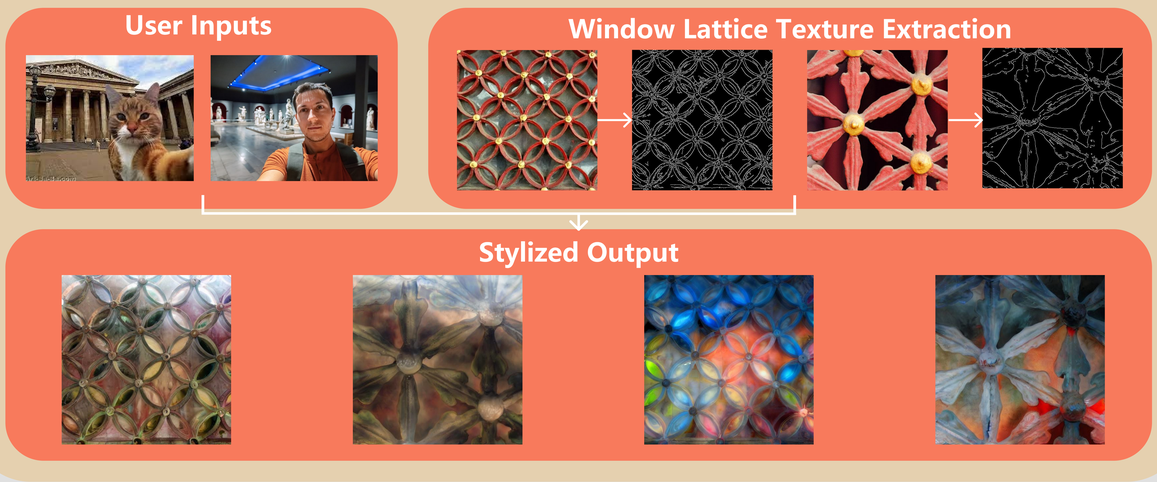
4 Personalization of cultural education

Visitors can customize their creations, catering to diverse interests and providing a unique cultural experience. The final artwork serves as both an educational achievement and a memorable souvenir, adding appeal and value to the program.

5 Enhancing social interaction and cultural transmission

Visitors can share their artwork on social media, increasing project engagement and cultural outreach. Families can bond through dual-screen interactive activities, promoting cohesion and creativity.

FEASIBILITY ANALYSIS



PROTOTYPE

1. Home Page



Today's Good and Bad Luck → Visitors can choose the relevant symbolic pattern to make a "wish"

sound button

2. Pattern Clues Page

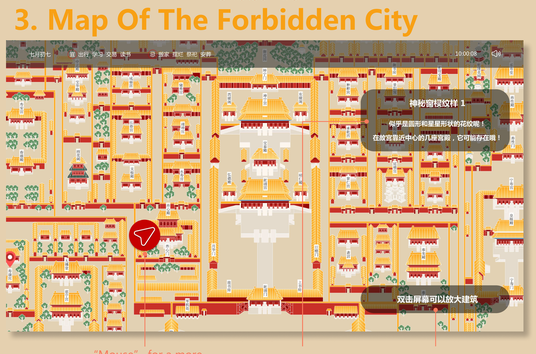


Hints on pattern features and placement

Ominous clouds (or other) cover up the tattoo pictures to add difficulty and interest and a greater sense of exploration

Interchangeable search patterns

3. Map Of The Forbidden City



"Mouse" for a more navigational feel

Clues

Operational reminders

4. Palace View Page



Name of the palace

Click on the clue magnifier and the screen will gradually zoom in and eventually lock onto the window pane pattern.

5. Pattern Information Page



Short graphic messages to lower the learning threshold

Pinyin, easy for children to read

Make a wish, i.e., use the pattern for artistic style transformation

6. Pattern Collection Page



Display of searched tattoos, can be reviewed repeatedly.

SUMMARY

This project aims to digitally preserve and promote the cultural heritage of the Forbidden City's window lattice patterns, offering interactive experiences for visitors, especially children, at children's museums. By exploring patterns via touchscreens, accessing related information, and generating personalized art using ControlNet and Stable Diffusion technologies, it enhances engagement and cultural awareness. Compared to traditional static displays, the project breathes new life into traditional culture through high interactivity and instant artistic outputs. Future plans include optimizing technology, expanding educational applications, and supporting the international promotion of traditional Chinese culture, establishing a model for innovative cultural preservation.