

Navigating Folklore in Augmented Reality: 'Bu Mian You Yi' as a Gamified Museum of Macao's Maritime Heritage

Xuetong Zhao

Nanjing Tech University
No. 30 Puzhu South Road, Pukou District
Nanjing, 211816, China
+86 138 1395 6678
zoeyzhaoz@hotmail.com

Hui Zhang

Independent Artist
No. 30 Xiaogang Road, Qingpu District
Shanghai, 201700, China
+86 130 0412 0149
mryart@foxmail.com

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INTRODUCTION

Against the backdrop of Macao's pluralistic cultural heritage—a fusion of Chinese and Western influences shaped by 400 years of maritime exchange—this study addresses the challenge of fading local memories amidst rapid urbanization. We present "Bu Mian You Yi" (The Sleepless Voyage), a location-based Augmented Reality (AR) application developed to revitalize the intangible cultural heritage (ICH) of Macao's Inner Harbour. Unlike traditional museum archives, this project reframes the city streets as a "gamified museum," inviting players to reconstruct local fishermen's stories, dragon dance legends, and sea deity beliefs through immersive onsite interactions.

DESIGN AND IMPLEMENTATION

Deployed along a 1.5km route from the Marine and Water Bureau (Beishanban Wharf) to the Water Market, the application integrates nine interactive AR sites. A key innovation lies in the Artist-AI Collaborative Workflow. We combined hand-drawn artistic scripts with AI-generated 3D modeling to create a unique visual style that bridges historical realism with folklore fantasy.

Key interactions include:

The Typhoon Shelter: Simulating a hurricane signal at the spiral car park to evoke the perilous life of boat dwellers.

The Ice Cabin: Unfreezing historical artifacts (e.g., shipbuilding tools, letters) floating in mid-air near the oxygenated pier via raycasting interactions.

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The Sound of Conch: An auditory installation capturing the soundscape of the past.

PRELIMINARY FINDINGS

A field deployment with 500 participants (comprising both tourists and residents) demonstrated the efficacy of the system. We employed the Stimulus-Organism-Response (S-O-R) framework to analyze user experience. Quantitative analysis indicates that the gamified AR experience significantly enhanced users' Aesthetic Emotion (M=3.21) and Sense of Presence (M=2.77).

Mediation analysis further reveals that Presence fully mediates the effect of Emotional Communication on users' willingness to recommend the experience. Furthermore, user segmentation based on K-means clustering identified distinct user groups (e.g., "Emotionally Resonant" vs. "Technology-First"). Results show that cultural motivation has a stronger impact on the quality of experience ($\eta^2 > 0.56$) compared to prior AR technical experience.

CONCLUSION

By framing digital games as curatorial tools, this study explores how AR can bridge Macao's historical maritime identity with contemporary tourism. It offers a scalable model for preserving urban folklore in the digital age, suggesting that artistic interpretation and narrative depth are as crucial as technological fidelity in heritage gamification.

BIO

Xuetong Zhao is currently a faculty member in the Department of Digital Media Art at Nanjing Tech University. Her creative practice and research interests concentrate on game studies, Virtual Reality (VR) and Augmented Reality (AR) interactive art, animated documentaries, and art therapy. She currently presides over a Youth Fund project of Humanities and Social Sciences research funded by the Ministry of Education of China. Additionally, she has published over 10 academic papers and translations in Chinese core journals.

Hui Zhang is an artist and researcher specializing in visual storytelling and digital media. He served as the lead visual designer for the 'Bu Mian You Yi' project, responsible for the hand-drawn aesthetic and artistic conception that defines the application's unique visual style.

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