Blossoms Across Time: AI-Assisted Cultural Dialogue Through Diverse Artistic Expressions in VR Intangible Cultural Heritage Experience

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Figure 1: *Timeless Blossoms,* a VR-AI system where users craft 3D floral designs that generative AI transforms into real-time Xieyi paintings, merging traditional art with technology for cross-cultural and temporal dialogue.

Abstract

Intangible Cultural Heritage (ICH) serves as a bridge between past, present, and future. For ICH traditions that have experienced historical disruptions, ancient texts and paintings provide invaluable insights. However, current VR systems for ICH often focus on static preservation, while AI applications remain largely limited to archival and documentation tasks. We present Timeless Blossoms, an AI-assisted VR system that enables practitioners to engage in realistic 3D flower arrangement while witnessing their Traditional Chinese Flower Arrangement (TCFA) compositions transform into 2D Xieyi (Chinese expressive) paintings in real time. By enabling participants to engage in a cross-temporal and cross-medium creative process, Timeless Blossoms offers a novel approach to cultural heritage preservation through AI and VR. Our work advances the discourse on AI-assisted cultural creativity by demonstrating how computational techniques can bridge diverse artistic expressions within ICH experiences.

Keywords

Virtual Reality, Generative AI, Intangible Cultural Heritage, Traditional Chinese Flower Arrangement
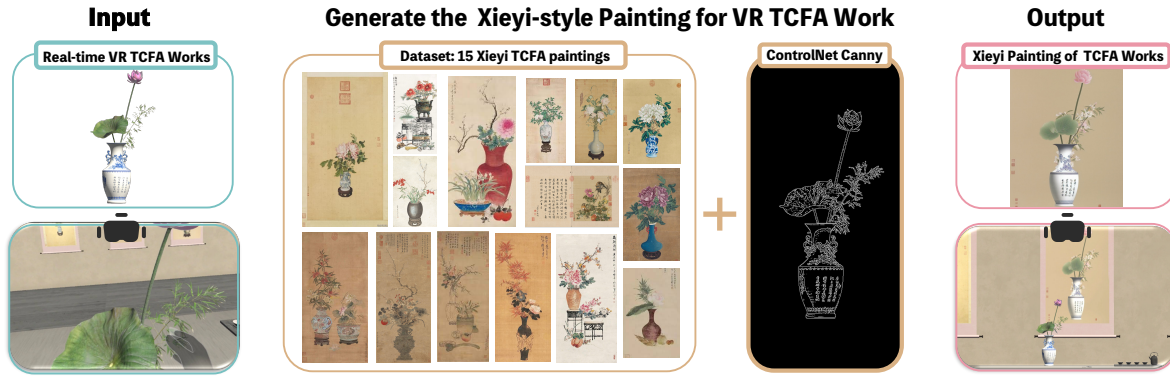
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Figure 2: AI-Assisted Cultural Dialogue Framework: Real-Time Integration of TCFA and Xieyi Painting in VR

1 Introduction

ICH plays a vital role in preserving cultural diversity amid growing globalization. Unlike tangible heritage, which is centered around physical artifacts, ICH embodies cultural knowledge, practices, and artistic expressions passed down through generations. However, for some ICH traditions that have faced historical disruptions or involve creations that are difficult to preserve, ancient texts and paintings often serve as the only remaining records. These artistic depictions serve as invaluable windows into the past, shaping how contemporary practitioners imagine and revive lost traditions.

VR has emerged as a valuable tool for ICH preservation. Yet, most VR applications focus on representing ICH rather than fostering deeper cultural dialogues. Similarly, while AI has demonstrated its creative potential, its role in heritage-related tasks has largely been confined to documentation, classification, and 3D reconstruction [Gîrbacia 2024]. How VR and AI can be integrated to enhance cultural experiences and artistic expression remains an open question.

This paper explores the intersection of VR, AI, and ICH through a unique project focused on TCFA. Ancient practitioners saw TCFA as a way to harmonize with nature and express emotions. They often depicted their TCFA creations in Xieyi Painting, transforming fleeting floral compositions into lasting artistic and cultural artifacts. These paintings were displayed alongside the arrangements, elevating everyday life into an artistic experience. However, TCFA experienced a decline, leaving behind only fragmented records in paintings and texts. Recently, TCFA has experienced a resurgence, particularly among individuals drawn to traditional culture and aesthetically enriched lifestyles [Wang and Qin 2020].

Hence, we present *Timeless Blossoms* (see Fig.1), an VR system enabling TCFA practitioners to arrange 3D flowers while their work transforms in real time into expressive Chinese paintings. Based on our previous work [Wang et al. 2025], we integrate VR with AI-generated artistic outputs to foster cross-temporal and cross-medium dialogue between traditional Chinese aesthetics and computational creativity. Through this fusion of ICH and modern technology, this project not only deepens creative engagement with TCFA but also illustrates how VR and AI can revitalize ICH, offering new avenues for cultural expression in the digital age.

2 System Implementation

VR TCFA System. We developed the sytem with Unity3D and implemented it with a Meta Quest 3. The Meta XR All-in-One SDK was integrated to provide VR features, enabling natural hand interactions. Three Xieyi paintings of TCFA are displayed hanging in front of the user, with a blank canvas in the center to showcase the real-time generated artwork.

AI generative System. Shown in Fig.2, our AI-assisted generative system is designed to transform 3D flower arrangements into expressive Xieyi paintings in real time. The system is trained on a curated dataset of 15 Xieyi-style TCFA paintings from historical records and digital archives, aiming to synthesize stylistically consistent outputs. We employed a diffusion-based generative model fine-tuned for ink-style rendering, incorporating Canny Control-Net to ensure consistency in edges and outlines. When the system detects that a plant model collides with a vase model and remains stationary for more than two seconds, it captures an isolated image of the floral composition. This image is then processed by the generative model to create a real-time Xieyi painting, which is dynamically displayed on the blank hanging scroll in front of users.

3 Discussion and Future Work

Our project, *Timeless Blossoms*, integrates AI with VR-based TCFA experiences, echoing historical artistic practices while leveraging computational creativity. Future work could focus on incorporating expert feedback to enhance the nuanced intentionality of generative outputs and expanding the cultural scope to support richer explorations of traditional aesthetics.

References

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