

Virtual Realities in Spiritual Practices: Exploring Immersive Technologies in Digital Rituals

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Abstract

This study explores the application of virtual reality (VR) technology to enhance the solemnity and immersion of digital religious rituals. The study evaluates how VR impacts users' perceptions of sacredness and their intentions to reuse the system by replicating a traditional temple setting and integrating key rituals such as lighting ceremonial lamps and offering incense. Quantitative and qualitative data from 30 participants revealed that VR significantly enhances the sense of solemnity, mainly through auditory elements like ritual music. However, limitations were noted, such as the absence of multisensory integration. The findings underscore VR's potential to redefine religious practices digitally while emphasizing the need for continuous technological improvements.

Keywords: *Virtual Reality, Digital Rituals, Sacredness, Multisensory Experiences, User Engagement.*

INTRODUCTION

From ancient times, religious belief has been an essential aspect of society, deeply intertwined with people's daily lives. In early agricultural societies, religion played a crucial role, with shrines and temples dedicated to local deities such as the Earth God to ensure a bountiful harvest. Many traditional festivals are tied to religious practices, involving prayers at home altars or local temples to seek blessings. With its rapid economic development and material abundance in modern society, spiritual fulfillment remains a crucial concern (Xie Renfeng, 2008).

With technological advancements and the digital age, the internet has permeated all aspects of life. Religious institutions have adopted digital technologies to stay relevant, such as offering online blessings, Tai Sui pacifications, and virtual worship. During the COVID-19 pandemic 2020, many physical and religious activities were suspended. For instance, Dharma Drum Mountain's annual New Year bell-ringing ceremony transitioned to an online format, allowing followers to participate remotely via live stream.

While online religious activities offer convenience, critics argue that digital rituals often oversimplify sacred processes. A few mouse clicks suffice for rituals like lighting incense or drawing lots, reducing solemnity and immersion (Tseng Yilun, 2012). This raises the question: Can we design experiences that retain the sacredness of religious rituals in a digital format?

Virtual reality (VR) technology, known for creating immersive 3D environments, offers a potential solution. By simulating sensory inputs such as visuals, sounds, and haptics, VR provides users an experience close to reality (Zhou Huiyi, 2022). VR technology has evolved significantly since its initial applications in the late 20th century, finding uses in diverse fields such as gaming, education, and medicine (Zhang Xun, 2018). This study aims to leverage VR to enhance digital religious rituals' solemnity and immersive experience, providing a more profound and authentic connection between practitioners and their faith.

Research Objectives

Based on the above background and motivation, this study aims to:

Explore whether VR experiences, besides providing immersion, realism, and interactivity, can evoke a sense of solemnity.

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Investigate user acceptance and willingness to reuse VR for performing religious rituals.

Research Scope and Limitations

Taiwan's diverse religious landscape includes a variety of practices and rituals, offering a rich cultural backdrop for this study. However, focusing on the rituals of the I-Kuan Tao, this research narrows its scope to a specific context. While this ensures a controlled analysis, it also limits the generalizability of the findings to other religious traditions. Furthermore, the study relies on a single VR environment built using Unity and experienced via Meta Quest 2, which may not fully capture the range of potential VR experiences. These limitations highlight the need for future research to explore diverse cultural contexts and incorporate advanced technological features to validate and expand upon the findings presented here. This study focuses on the rituals of the I-Kuan Tao due to their procedural complexity. Participants with prior experience at the study site, a temple in Xindian, Taiwan, were recruited to evaluate their perceptions after performing rituals in a VR environment. Due to time and resource constraints, the following boundaries were set:

Participants: Limited to individuals familiar with the study site.

VR Environment: Built using the Unity game engine and experienced via the Meta Quest 2 headset.

Functionality: This study prioritizes the experiential aspects of rituals. Peripheral interactions unrelated to ritual performance are excluded.

LITERATURE REVIEW

Evolution and Applications of Virtual Reality

Virtual reality (VR) is an advanced simulation technology that delivers sensory experiences, immersing users in virtual environments. The concept traces back to Stanley G. Weinbaum's 1935 science fiction work *Pygmalion's Spectacles*, and its development has significantly accelerated over decades. Key milestones include Morton Heilig's Sensorama Simulator in the 1950s and Ivan Sutherland's "Sword of Damocles" in the 1960s, marking the advent of head-mounted display systems (Boas, 2013). More recently, VR has expanded beyond entertainment into education, healthcare, and military training, illustrating its transformative potential across diverse sectors (Zhang Xun, 2018).

Digital Transformation in Religion

As society embraces digitalization, religious institutions have adapted by offering virtual services. Examples include virtual blessings, online lot drawing, and digital religious education. For instance, Taiwan's Zhenlan Temple has implemented GPS tracking for its Mazu pilgrimage and developed apps for virtual worship (Hong Chunping, 2021). The use of digital technologies underscores the potential for expanding religious practices into the virtual realm.

Challenges of Digital Religious Rituals

Critics argue that digital rituals often lack the solemnity of traditional practices due to oversimplification. Rituals performed with a few mouse clicks may lose their depth, reducing their spiritual impact (Tseng Yilun, 2012). VR technology, which provides immersive and interactive experiences, could address these issues.

METHODOLOGY

Experimental Design

This study explores using VR to enhance religious rituals' solemnity and immersive quality. The virtual environment replicates a temple in Xindian, Taiwan, with rituals including lighting a ceremonial lamp, offering incense, and bowing. Thirty participants familiar with the site were recruited to evaluate the VR experience.



Fig1. Real I-Kuan Tao Temple in Xindian



Fig2. 3ds Max VR Environment

Procedures

Participants were introduced to the VR setup and instructed on its use.

Participants performed rituals (lighting a ceremonial lamp, offering incense, bowing) in the virtual environment after a brief familiarization session.

Participants completed questionnaires assessing immersion, realism, interactivity, solemnity, and willingness to reuse the system.





Fig3. Activities in real Situation
(Up- lighting a ceremonial lamp, Mid-offering incense, Down-bowing)



Fig4. Activities in VR

(Up- lighting a ceremonial lamp, Mid-offering incense, Down-bowing)

Tools and Equipment

Hardware: Meta Quest 2 VR headset, controllers, and a desktop computer.

Software: Unity game engine for VR environment development.

Questionnaires: Likert-scale items adapted from established VR experience frameworks.

Analysis Methods

Quantitative data from questionnaires were analyzed using descriptive statistics and Pearson's correlation analysis. Qualitative feedback from interviews was coded and categorized to identify themes.

RESULTS

Demographic Distribution Analysis

Table 1 shows the status of virtual research in real environment. Table 2 overviews the participants' demographic attributes, including gender, age, education level, and prior VR experience. Frequency and percentage distributions are presented for each attribute. The sample comprises 16 males (53.33%) and 14 females (46.67%), indicating a slight predominance of male participants. Participants aged 30 or younger represent the majority (56.67%), while those over 30 account for 43.33%. Most participants have a college-level education or below (63.33%), with fewer holding graduate-level degrees (36.67%). 60% of participants reported prior experience with VR, demonstrating familiarity with the technology among the majority.

Table 1 Experiment Procedures









	Familiarization Session.	lighting a ceremonial lamp	offering incense	bowing
VR				
Real environment				

Table 2 Demographic Distribution of Participants

Variable	Value Label	Frequency	Valid Percent	Cumulative Percent
Gender	Male	16	53.33%	53.33%
	Female	14	46.67%	100.00%
Age	≤ 30 years	17	56.67%	56.67%
	> 30 years	13	43.33%	100.00%
Education Level	College or below	19	63.33%	63.33%
	Graduate or above	11	36.67%	100.00%
VR Experience	Yes	18	60.00%	60.00%
	No	12	40.00%	100.00%

Immersion

Participants rated the visual and auditory experiences positively, highlighting the exceptional visual quality of the VR temple, as evidenced by I01 receiving the highest mean score (4.70). This finding aligns closely with the study’s objective of assessing immersive experiences, suggesting that high-quality visuals significantly enhance user satisfaction and the overall VR experience. The VR device’s comfort and ease of use were rated lower in comparison.

Table 3 The Result of Immersion

Variable	Mean	Std Dev	Kurtosis	Skewness
I01: The visual experience in the VR temple is excellent.	4.70	0.60	2.75	-1.91
I02: The auditory experience in the VR temple is excellent.	4.63	0.61	1.33	-1.50
I03: Wearing the VR device feels comfortable.	3.97	1.03	-0.93	-0.53
I04: The VR device facilitates motion easily.	3.93	0.98	-0.61	-0.57

Realism

Realism scores were highest for auditory elements like music (R03: 4.67), highlighting the significance of sound in enhancing the sense of presence and authenticity within the virtual temple environment. Participants frequently emphasized that music provided an emotional connection and contributed to the immersive ambiance. This suggests that auditory elements play a pivotal role in bridging the gap between virtual and real-world experiences, a finding that aligns closely with the study’s focus on realism. However, hearing external sounds during the experience detracted from the sense of realism (R05: 2.47).

Table 4 The Result of Realism

Variable	Mean	Std Dev	Kurtosis	Skewness
R01: The scene in the VR temple feels real.	4.50	0.63	-0.13	-0.89
R02: The statues and decorations feel real.	4.50	0.63	-0.13	-0.89
R03: The music in the VR temple feels real.	4.67	0.55	1.20	-1.41
R04: The lighting in the VR temple feels real.	4.43	0.63	-0.45	-0.64
R05: Hearing surrounding sounds diminishes realism.	2.47	0.90	1.15	1.32

Interactivity

Interactivity was rated highly, particularly for the kneeling mat (A04: 4.77), which participants found significantly enhanced realism. This result underscores the importance of tangible props in VR environments, as the kneeling mat added a sense of physical engagement and authenticity that other elements, such as ceremonial lamp lighting (A01: 4.33), could not fully replicate. Participants consistently emphasized that the mat bridged the gap between virtual and physical realities, thereby deepening their overall sense of immersion and interaction.

Table 5 The Result of Interactivity

Variable	Mean	Std Dev	Kurtosis	Skewness
A01: Lighting the ceremonial lamp feels real.	4.33	0.92	4.65	-1.87
A02: Offering incense feels real.	4.23	0.97	2.67	-1.47
A03: Bowing feels real.	4.43	0.77	2.06	-1.44
A04: The kneeling mat enhances realism.	4.77	0.50	4.25	-2.15

Solemnity

Music (S03: 4.63) was consistently rated as the most impactful element for fostering a sense of solemnity. Participants frequently attributed this to the harmonious and contemplative nature of the musical composition, which evoked feelings of reverence and emotional connection. The music’s role in creating an immersive and spiritually uplifting ambiance was highlighted as a pivotal factor in enhancing the overall solemnity of the VR temple experience.

Table 6 The Result of Solemnity

Variable	Mean	Std Dev	Kurtosis	Skewness
S01: The temple scene feels solemn.	4.40	0.89	6.19	-2.16
S02: The statues and decorations feel solemn.	4.43	0.94	5.19	-2.10
S03: The temple music feels solemn.	4.63	0.81	14.10	-3.40
S04: Lighting the ceremonial lamp enhances solemnity.	4.50	0.57	-0.62	-0.59
S05: Offering incense enhances solemnity.	4.37	0.67	-0.59	-0.59
S06: Bowing enhances solemnity.	4.57	0.57	-0.17	-0.88
S07: The VR temple's solemnity substitutes for an actual temple when inaccessible.	4.07	1.05	-0.77	-0.72

Reuse Intention

Participants showed a strong willingness to reuse the VR system, with an average score of 4.57. This enthusiasm stemmed from the immersive qualities of the VR experience, which many described as engaging and emotionally satisfying. The ability to replicate sacred rituals in a convenient and accessible format was especially appealing, indicating the potential for long-term integration into both personal and communal spiritual practices.

Table 7 The Result of Reuse Intention

Variable	Mean	Std Dev	Kurtosis	Skewness
C01: I want to reuse or share this experience in the future.	4.57	0.63	0.43	-1.17

Pearson Correlation Analysis

Correlation analysis revealed strong relationships between immersion, solemnity, and reuse intention, providing critical insights into the dynamics of user engagement. Immersion emerged as a pivotal factor, driving a heightened sense of solemnity and reinforcing intentions to reuse the system. This interconnectedness underscores the importance of creating immersive and solemn experiences to enhance user satisfaction and adopting VR technology for spiritual practices. By quantifying these relationships, the analysis highlights areas for targeted design improvements that could further optimize the user experience and broaden the system's appeal. Solemnity significantly correlated with both interactivity ($r = 0.386$, $p < 0.05$) and reuse intention ($r = 0.474$, $p < 0.01$), reflecting its pivotal role in bridging user interaction with the spiritual depth of the experience. These correlations emphasize that features enhancing solemnity deepen the engagement with rituals and reinforce the likelihood of system reuse. This finding aligns with the study's objectives to integrate meaningful and accessible spiritual elements into VR environments, providing a comprehensive framework for improving user experience.

Table 8 The Result of Pearson Correlation Analysis

Variable	Immersion	Realism	Interactivity	Solemnity	Reuse Intention
Immersion	1.000	0.601**	0.640**	0.399*	0.687**
Realism	0.601**	1.000	0.514**	0.197	0.256
Interactivity	0.640**	0.514**	1.000	0.386*	0.313
Solemnity	0.399*	0.197	0.386*	1.000	0.474**
Reuse Intention	0.687**	0.256	0.313	0.474**	1.000

**Significant at the 0.01 level (two-tailed). *Significant at the 0.05 level (two-tailed).

Qualitative Insights

Participants highlighted the following:

Strengths: High-quality visuals and soundscapes enhanced the sacred atmosphere.

Limitations: Lack of olfactory feedback and overly simplistic interactions reduced realism.

Recommendations: Incorporate multisensory features, expand interaction capabilities, and enable multi-user

participation.

DISCUSSION

Integration of Immersive Features The findings demonstrate that VR's ability to evoke a sense of sacredness relies heavily on visual and auditory elements. Ritual music emerged as a critical factor, contributing significantly to participants' perceptions of solemnity. The visual aspects, such as the temple's design and lighting effects, also played an essential role in creating a sense of immersion and spiritual engagement. However, the absence of tactile and olfactory inputs was identified as a limitation, suggesting areas where the VR experience could be enhanced. These sensory modalities could deepen the user's sense of presence and strengthen the connection to the ritual environment.

User Acceptance and Reuse Intentions The strong correlation between solemnity and reuse intentions underscores the importance of preserving sacredness in digital rituals. Participants were willing to repeatedly engage with the VR system, highlighting its potential for long-term adoption. This suggests the system successfully conveys the spiritual essence required for meaningful rituals. Moreover, customizing rituals and settings could enhance user satisfaction and broaden its applicability to various cultural and religious contexts. The findings also indicate a potential for VR systems to foster a sense of community and shared experience, even in remote or isolated settings.

Comparison with Traditional Rituals While VR rituals cannot fully replicate the sensory richness of traditional practices, they offer a viable alternative, particularly for individuals with mobility constraints or those living in remote areas. The ability to engage in meaningful spiritual experiences without physical barriers aligns with the inclusivity goals of many religious institutions. This adaptability could serve as a bridge for younger generations, integrating modern technology with traditional values. However, it is essential to recognize that some participants expressed concerns about the lack of physical authenticity and the emotional depth associated with traditional rituals, highlighting an area for further refinement.

Future Directions To enhance the realism and interactivity of VR religious rituals, future developments should:

Integrate Multisensory Inputs: Adding tactile and olfactory feedback could significantly enhance the immersive quality of VR rituals, making the experience more authentic and engaging.

Expand Interactive Features: A broader range of rituals and interactive elements, such as customizable avatars and real-time feedback, would cater to diverse user needs and preferences.

Enable Multi-User Participation: Allowing communal worship experiences within the VR environment could foster a sense of community and shared spiritual engagement. This feature could be particularly beneficial for diasporic communities seeking to maintain cultural and religious connections.

CONCLUSION

By leveraging VR technology, this study provides a pathway for digital religious practices to maintain their sacredness and emotional resonance. The findings emphasize the critical role of visual and auditory elements in creating a meaningful and immersive experience while identifying areas where sensory and interactive enhancements could further elevate the system's effectiveness. As technology advances, VR could redefine how faith is practiced in an increasingly digital world, making spirituality accessible to all, regardless of physical constraints. These findings highlight the transformative potential of VR in religious contexts, offering both challenges and opportunities for future exploration.

Integrating multisensory features and expanded interactivity presents a promising avenue for bridging traditional and modern spiritual practices. By addressing current limitations and embracing innovative solutions, VR systems can provide a substitute for physical rituals and an enhanced platform for spiritual growth and connection in diverse and globalized societies.

Ethical statement

The Ethical statement is not applicable.

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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