StorageChat Timeline: A Generative AI-Based Art Appreciation System for Enhancing Immersion and Exploratory Experience

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Figure 1: Interaction Interface of StorageChat Timeline

Abstract

This video showcases StorageChat Timeline, an AI-powered system utilizing a Large Language Model (LLM) and generative AI technologies (e.g., style transfer, image-to-video) for art appreciation education. By offering real-time interactive question-and-answer experiences, the system enables users to construct the meaning of artworks based on their knowledge and experiences. It also provides immersive generative animations reflecting the artworks' styles and multimodal features, including text-to-speech and dynamic visuals, to enhance emotional engagement. Through this design, the system aims to enhance immersion, learning motivation, and visual literacy, fostering active participation in art appreciation. This innovative approach enhances accessibility to art and proposes a generative AI-driven methodology for art education. The video demonstrates how the system's key features—AI conversational interface, immersive animations, and multimodal integration—create an engaging and visually interactive experience, showcasing its potential to transform art appreciation.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; • **Applied computing** → **Interactive learning environments**.

Keywords

Generative AI, Large Language Models (LLM), Museum Education, Immersive Learning

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1 StorageChat Timeline

As shown in Figure 1, StorageChat Timeline is designed to enable visitors to actively explore and immerse themselves in art appreciation by integrating an LLM-based AI curator with a multimodal appreciation environment. The system incorporates interactive conversations, audiovisual feedback, and morphing of artworks to enhance engagement. The AI curator acts as a facilitator for art

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appreciation, posing questions to viewers and providing responses based on artwork data. During the interactive conversation, users can select artworks of interest and explore them through a structured dialogue framework consisting of five question templates:

- `Generating Random Questions`: Provides viewers with randomized questions based on artwork data to facilitate exploration.
- `VTS-Based Appreciation Strategy`: Using visual thinking strategies (VTS) to present open-ended questions that guide viewers in exploring the artwork.
- `Connecting to Personal Experience`: Encourages viewers to relate artworks to their personal lives with prompts like "How does this artwork connect to your life?".
- `Providing Simple Explanations`: Features explanations in a simple manner, akin to explaining to a child, making the experience accessible to novice viewers.
- `Recommending Key Appreciation Elements`: Highlights specific aspects of the artwork that viewers should pay attention to for a deeper understanding.

The AI curator, which combines TTS-based voice feedback and lip sync animation, provides a more natural and immersive interaction. Additionally, visual feedback mechanisms, such as zooming in and out of artwork images, enrich the viewing experience. The morphing effect, utilizing StyleGAN and the latest Generative AI models, dynamically transitions between related artworks during AI explanations, enhancing engagement and appreciation immersion. Furthermore, immersive animations based on Style Transfer and Generative AI reflect the original style of the artwork, increasing emotional immersion and the curator's presence.

An initial prototype user test was conducted with 21 participants. The results indicated that 95.24% of respondents found the AI-driven conversational functionality effective in enhancing their understanding of artworks. Open-ended responses included feedback such as:

- "Being able to ask questions and receive answers helped me understand the artwork better."
- "Even when I couldn't think of a question, the Al provided recommended questions, which improved my comprehension of the artwork."

Additionally, a significant number of participants identified the visual representation of the artist's style as a key factor in increasing immersion. Some users noted:

- "The animation mapping after selecting an artwork enhanced my immersion."
- "Compared to traditional framed exhibitions, the transformation and style adaptation of the artwork increased my visual engagement."

Regarding the effectiveness of integrating multimodal elements, 95.24% of respondents stated that the system's multimodal components contributed positively. This indicates that the seamless integration of conversational Al and immersive content can provide meaningful results in art appreciation education.

2 CONCLUSION

StorageChat Timeline is a system that enhances immersion, learning motivation, and exploration in art appreciation by integrating AI-driven conversations, generative AI techniques (Style Transfer, Img2Video), and multimodal interactions. Initial user evaluations confirm that AI-driven questions effectively stimulate viewer thinking, while visual feedback enhances sensory immersion. These findings suggest that an AI-integrated design can significantly enhance immersion and engagement in art appreciation experiences. In the initial prototype, pre-generated animations created using Krea AI [1] were employed to implement the morphing animation. In future development, we plan to dynamically transforms artworks in real-time to match the responses generated by the LLM into the system by incorporating ComfyUI Animatediff Morphing [2]. Additionally, the LLM module, which currently generates diverse question templates through prompt engineering, will be further optimized. This study contributes to HCI research by demonstrating how AI-driven immersive systems can transform the way visitors engage with art in museums and digital exhibitions.

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