

Virtual Museum of Arts

Roza Atarod, Shravya Kolavara, Yang Yuan

School of Information

The University of Texas at Austin



The University of Texas at Austin
School of Information

Background

With the current daunting challenges that we face in a world today of restricted travel, remote working, and limited social interaction due to COVID -19, even after the initial crisis measures have been relaxed, we will be living the “new normal” for some time to come. So how exactly can we continue providing essential education in the field of art history? Virtual Reality! Virtual reality environments offer us a great flexibility and adaptability in many training opportunities in education. It allows us to transport visitors to different parts of the world and recreate the spaces virtually without the need to be present in them (Huaman et al., 2019, p. 226).

Immersion within a digital environment can be a powerful tool in education. Allowing students to experience the learning material through multiple perspectives, such as from different angles and positions, provides a major advantage .When looking at a museum, the perspective of being inside enables users' actional immersion and motivation through embodied, concrete learning, as it would happen in a real museum (Cecotti et al., 2020, p. 22). Immersive interfaces such as in a VR environment can develop education experiences through situated learning (Dawley & Dede, 2013, p. 733).

Currently there exists numerous virtual museums that aim to simulate the experience that one would have if they visited the physical museum. These tend to be static images within the virtual environment. There is a need to create more immersive environments within this virtual museum. We aim to improve this experience for art history education by allowing users to immerse themselves into the painting and into the artists mind. The users are not only allowed to step into the painting and experience it as if they are standing inside of it, but by evoking emotion through sound, textures and colors the user is able to fully comprehend various aspects of the painting. The idea is to educate the user around the mind of the artist at the time the painting was created. By including descriptions by the artist themselves, the environment creates an overall educating experience for the user.

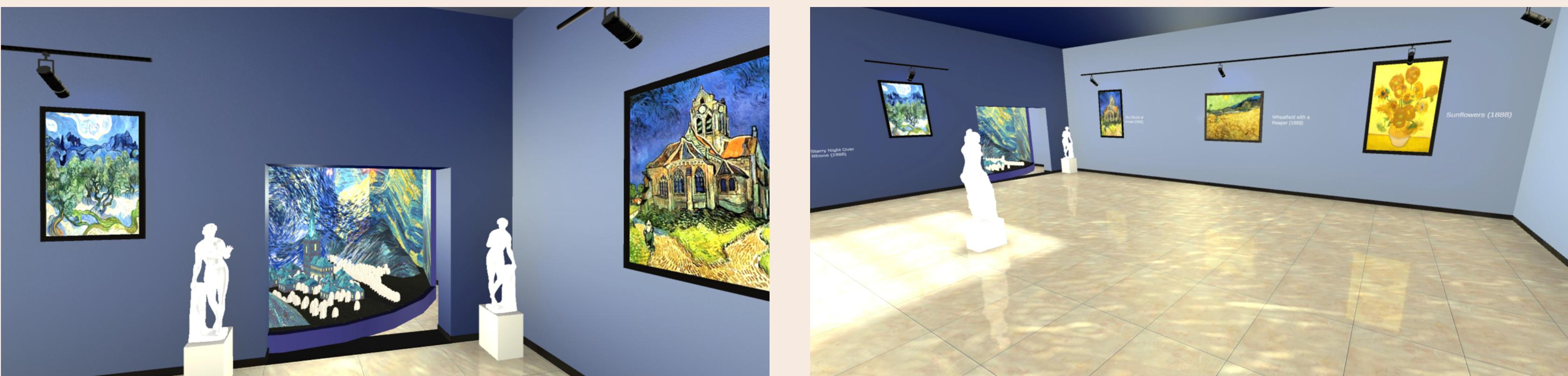
Equipment

- Display:** We will use a computer screen or VR headset for visual display. The VR headset may provide a more immersive experience to the users. However, we do want to include those who do not own a VR headset so we would make the experience compatible on computer screens.
- Sounds:** It is important to have a set of stereo or headphones during the experience. Because we included street sounds of the era to create an immersive feeling. Sounds were also used to tell the story about the artist and the painting.
- Controller:** It would require a controller to navigate through the experience. It could be keyboards on a computer or a remote controller for a VR headset.

Virtual Environment and Interaction



At the entrance of the gallery the user will face with the Starry Night painting with 3D visual effects



View toward 3D reconstruction of Starry Night

Art gallery space for creating physical presence

We designed a virtual museum that includes four spaces. The first space is the museum lobby in which the user starts their experience and exploration of the space and starts perceiving the environment that they are going to experience.

In the second space, users face the two-dimensional version of Starry Night, one of the most known paintings of Van Gogh. In this setting as the user walks toward seeing the painting from a close distance the explanation about Van Gogh, his painting style and some extra information is played as a voice over in the space. The voice can be used to help educate the user, guide them towards viewing a certain area of the scene. To create a more impressive experience we incorporated motion particles in the painting and that helps us to bring an animated effect to the experience and make the scene more lively for the user. We hope that this technique can make a wow effect for the user and engage them more toward the subject of the experience. For the next step, there are some other Van Gogh's paintings that are there to help the user get more familiar with works of the artist. Users can also listen to Van Gogh's audio that talked about those paintings. Finally, users can see the three-dimensional representation of the Starry Night in a 360 degree view. Our purpose is to show the user the possible representation of this artwork in a three dimensional setting and help them to understand the space. Virtual reconstructions of paintings have always aroused a great interest, not only for the undoubtedly appeal exerted by the feeling of being in the space, but also for the rich opportunities offered by such tools for study and research.

Since the user in this experience is mostly an observer of the space and triggers some actions and voice overs by moving in the specific areas of the setting, we didn't find any reason to model the physical appearance of their avatar. The user understands about self-presence by moving freely in the space and turning their head to get a 360 degree view of the space. By moving in the space and facing different settings of the art works in the gallery, the user believes the physical presence and will be engaged with the experience. Though seeing facial or body characteristics of the avatar can help the sense of presence, we didn't find too much value in this experience to work on them.

Measures

We will adopt a mix of different methods to measure the user experience and satisfaction of our application.

- Presence:** we will use the Igroup Presence Questionnaire to measure the sense of presence in VR.
- Interaction:** we will observe and record the session and keep track of the participants' snapshot.
- Immersion:** we will measure the immersion by observing the reactions the user had to the agent during the experience.
- Perception:** We will use a self-report questionnaire to measure how people perceive the information they receive in the experience.
- Satisfaction:** we will use the 7-point Likert Scale to measure the participants' satisfaction of our VR application.

Discussion

By this experience we expect users find themselves present in a art gallery setting and express their engagement in the physical space that they are in. Observation of moments of excitement, attention and engagement can provide us with some clues for understanding the level of immersion that they feel. Also we expect them to be able to reflect their perception of the information they received and discuss about what they learned in this experience. Since we incorporated some unique visual techniques and voiceover in the experience, we expect to have a high level of satisfaction as a result of user engagement.

References

- Cecotti, H., Day-Scott, Z., Huisenga, L., & Gordo-Pelaez, L. (2020). Virtual Reality for Immersive Learning in Art History. 2020 6th International Conference of the Immersive Learning Research Network (ILRN), 16–23. <https://doi.org/10.23919/ilrn47897.2020.9155108>
- Dawley, L., & Dede, C. (2013). Situated Learning in Virtual Worlds and Immersive Simulations. *Handbook of Research on Educational Communications and Technology*, 723–734. https://doi.org/10.1007/978-1-4614-3185-5_58
- Huaman, E. M. R., Aceituno, R. G. A., & Sharhorodska, O. (2019). Application of Virtual Reality and Gamification in the Teaching of Art History. *Learning and Collaboration Technologies. Ubiquitous and Virtual Environments for Learning and Collaboration*, 220–229. https://doi.org/10.1007/978-3-030-21817-1_17