Figure 1 Alice visits a travel hotspot

Figure 2 Alice uses IM to record 360-degree video

Immersive Moments in AR (IMinAR)

Yan-Ming Chiou

University of Delaware

Newark, DE 19711, USA

steveice@udel.edu

Che-Chuan Weng

National Taipei University of Technology

Taipei, Taiwan

suibi.weng@gmail.com

ABSTRACT

Augmented reality is an emerging technology in the past five years, and there are more and more mobile devices support AR capabilities. People use lots of face-tracking features with the filter to change their appearance or taking a picture with some famous celebrities recently. However, these applications lack social interaction to connect people together and provide a platform for people to collaborate. In this paper, we proposed Immersive Moments in AR (IMinAR) to enable people to experience special moments with close friends and families.

KEYWORDS

augmented reality, social, face-to-face, collaboration, design fiction

CSS Concepts

- Human-centered computing → Mixed / augmented reality
- Human-centered computing→Collaborative and social computing→Collaborative and social computing theory, concepts and paradigms→Social content sharing
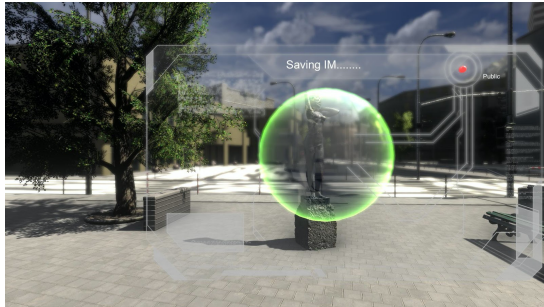

Figure 3 Alice is saving IM and to publish

Figure 4 Mark meets Alice

INTRODUCTION

Augmented reality (AR) has been studied and developed from both industry and academia fields for a decade. Most of the work in AR focuses on a single user scenario, such as displaying 3D objects by scanning a QR code on a 2D image, interacting with the information overlaying on a real-world object, and some simple interaction between 3D objects. However, AR can provide more rich content interaction, high fidelity interaction with haptics and spatial sounds, and even more collaboration by blending physical and virtual interactions.

Social networks have become essential parts of our daily lives since Facebook started the public service in 2005. After the wide usage of Facebook, other social network platforms rolled out, such as Twitter, Instagram, Snapchat, Tick Tock, and WhatsApp. Nevertheless, there are still very few works to combine AR with Social Networks. In order to stimulate the development of the next generation of Social AR applications, we believe the immediate next step is to transform the interactive and social experiences into the AR form and bring more immersive experience to it.

In the paper, we present **Immersive Moments in AR** (IMinAR), which is an AR application for people who use AR glass or contactless lenses for AR experience. We will discuss the design concepts, prototypes, social acceptance, and privacy considerations in Chapter 2. In Chapter 3, we summarized our work, including future research plans.

APPROACH

Our Vision

Recently, the AR devices have transformed from mobile devices into wearable devices, such as Microsoft HoloLens, MagicLeap, Bose AR Glass, and Nreal light. The user experience of the AR application will be more comfortable and more straightforward with glass and contactless lenses that like the one that most people use in their daily life. With this new type of device in mind, we envision the next wave of the AR application would have a more intuitive and futuristic user interface. In the near future, people can talk to their artificial intelligence (AI) virtual agent on the

road the work/school. They can see the information provided by AI in front of their eye and overlapped with the physical world.

Scenario

The following scenario was developed to explain our design concept. We use the Unity Game Engine and some 3D models to present our Social AR application design.

Alice visited a scenic spot with the sightseeing group, and the magnificent spectacle fully attracted her spread itself out before her eyes, as shown in Figure 1. At the moment, she turned on the recording function of her AR glasses for recording the 360-degree environment as IM, as shown in in Figure 2. After recording, the IMinAR application uses its AI-editing feature to remove the content with privacy related and upload to the cloud for rendering and send a link back to Alice. When Alice received the link, she set the sharing setting to the public. In the next 24 hours, there will be an IM AR sphere orbiting Alice, as shown in in Figure 3.

After the trip, Alice was on the way to the supermarket for groceries shopping. When she walked through the park, a man named Mark was resting on a bench and wearing a pair of AR glasses and noticed the IM sphere surrounding Alice, as shown in in Figure 4. Mark used his AR glasses to select one of Alice's IM and open it with eye-tracking command and hand gesture-tracking, as shown in in Figure 5. Through the AR glasses, Mark saw Alice's recording of the scenic spot. In this 360-degree video, the other visitors are eliminated, except for Alice and Mark to watch together, as shown in in Figure 6.

After the experience, Mark sent the heart button to Alice's IM and left a message, "That was a great spot to visit this season, and I was there two years ago. I recommend a nice restaurant called The Taste of Horizon near the visiting center. Maybe you can try it next time." Alice saw Mark's comment and was shocked about how she can forget to try the local food there. And she walked to Mark to ask him more about the food, local spots and share some travel experience.

Social Acceptance

We assume the future AR glass can understand our eye gaze position with its eye-tracking capabilities. When a user gazes at the specific Immersive Moments, the AR glass will understand which moments that the user wants to open without saying anything. With this design, people won't feel weird to stare at another person for several seconds to confirm or execute the action.

Figure 5 Mark is browsing and selecting Alice's IM

Figure 6 Mark is watching Alice's IM

CONCLUSIONS

To conclude, we proposed an innovative social application called Immersive Moments in AR (IMinAR) to fulfill people's curiosity about another person's life. With IMinAR, the user not only can experience life from the sharer's view but also provide the comments, send the invitation, and share its own experience to those immersive moments. We also provide a tourism scenario to explain the idea of this application detailed. We believe, with IMinAR, people can have a unique experience on the Social AR platform and also preserve privacy for the society.

REFERENCES

[1] Radu, I. (2016). Exploring the usability of augmented reality interaction techniques during children's early elementary-school tears (Doctoral dissertation, Georgia Institute of Technology).
[2] Facebook www.facebook.com, accessed: 2020/09/07
[3] Microsoft HoloLens https://www.microsoft.com/en-us/hololens, accessed: 2020/09/07
[4] Magic Leap https://www.magicleap.com/, accessed: 2020/09/07
[5] Bose AR https://www.bose.com/en_us/products/frames.html, accessed: 2020/09/07
[6] Nreal Light https://www.nreal.ai/, accessed: 2020/09/07
[7] Unity Game Engine https://unity.com/ , accessed: 2020/09/07
[8] Mixamo: Animate 3D characters for games, film, and more. https://www.mixamo.com/#/, accessed: 2020/09/07
[9] Windridge City, Unity Technologies, https://assetstore.unity.com/packages/3d/environments/roadways/windridge-city-132222, accessed: 2020/09/07