DESIGNING AUGMENTED REALITY ART GALLERIES

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ABSTRACT

Augmented Reality (AR) allows the real time blending of exhibited objects with digital information such as 3D models, still images, video clips, and web pages. The blending presents exhibition visitors with a more interesting and exciting experience. This paper focuses on the creation and presentation of artworks using mobile AR technology.

KEYWORDS

Augmented Reality, Art gallery, Trigger image, Smartphone, AR apps

1. INTRODUCTION

The development of digital computers and the emergence of computer networks have transformed our ordinary tasks and lives. People can even see objects invisible to the naked eye with various electronic devices: Doctors can examine and operate on patients while monitoring overlaid medical images [1]. Augmented reality (AR) provides users with a view of virtual objects superimposed on the real world. Users can control the virtual environment through direct interaction with objects tracked in the physical environment [2]. AR technology has been utilized in a variety of areas including education, marketing, and art creation and exhibition for more than four decades. And now, modern mobile AR is available to anyone with a smart phone or a tablet through AR apps, which can be downloaded for free from various "app stores." This paper focuses on mobile AR technology in artwork creation and exhibition

2. MOTIVATION

AR exhibitions can be presented in traditional settings, such as galleries and museums, but they can also be presented on the Internet. Exhibitions based on AR technology allow viewers to interact with the content in a fresh and exciting way. Typically, the interaction of museum visitors with the displayed artwork is very constrained: They cannot look at the artwork from different angles, compare it to other artworks, or study it in different contexts. Augmented Reality provides an innovative way to attract viewers with a more appealing, adaptive and pleasant experience.

3. DESIGNING THE ART GALLERY

The goal of this AR art gallery is to provide viewers with extraordinary experiences by mixing real-world images with digital graphics or information on the viewing screen of a smart phone or a tablet. Each trigger image is intentionally displayed in another outdoor setting rather than in a

traditional picture frame. Only the trigger image is affected through AR technology, leaving the frame image intact. Thus, the trigger images are presented in contrast to their frames, as well as to their overlays, in color, style, time, region and so forth. The resulting artwork brings to mind the idea of 'dépaysement' or 'collage' proposed by surrealists. It recalls what Lautréamont said, "As beautiful as the chance encounter of a sewing machine and an umbrella on an operating table." The chance encounter of unrelated things by displacing or repositioning them from their normal use and position is 'beautiful;' it triggers not only a feeling of excitement in our senses, but also an awakening moment in our unconscious mind.

Figure 1 shows the trigger image used in the first example of the AR artwork. The original artwork was created by Prof. Cho DukHyun at Ewha Woman's University of South Korea and photocopied with permission.

Figure 1

Here, the AR technology adds a colorful traditional Korean wedding costume to the real-world image. This results in the juxtaposition of two very different images, as seen in Figure 2 (a) and (b): black/white and color, and Western wedding costume at the turn of the century in Korea and traditional Korean wedding costume. The resulting AR artwork generates a sense of cultural collision.

(a)

(b)

Figure 2

The second AR artwork exhibits a huge screen installed between two trees in the woods, as seen in Figure 3. The scene reminds us of Manet's "Le Déjeuner sur l'herbe" (The Luncheon on the Grass).

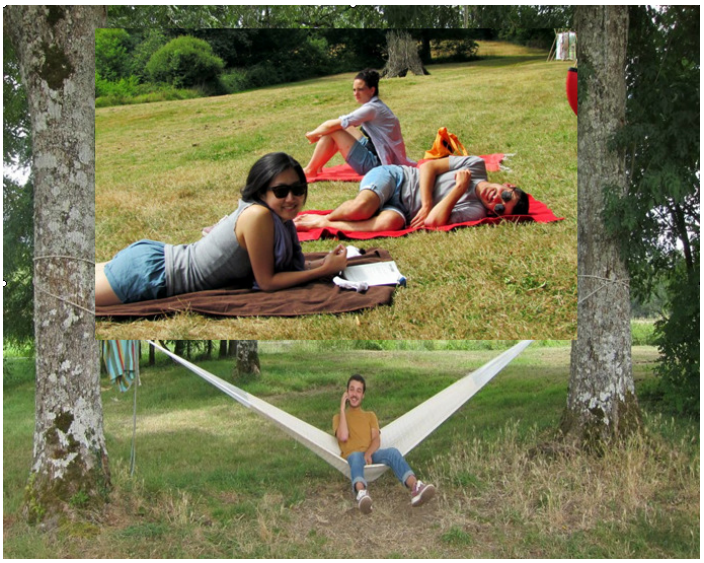

Figure 3

Figure 4 displays an overlay of Figure 3. AR technology adds a cartoon of Napoleon from a battle scene. Unexpectedly, the war hero in this image is battling a tank. Not only is the peaceful atmosphere in contrast to the belligerent overlay, but the realistic image of contemporary time is incongruous with the caricatured Napoleonic era depicted in the same frame.

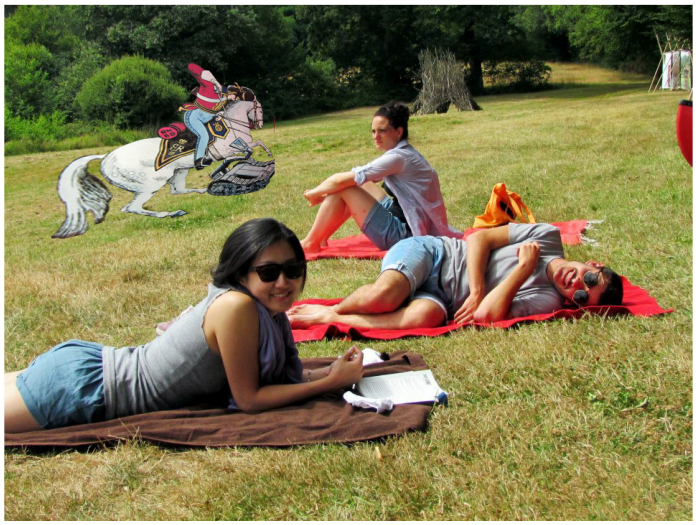

Figure 4

In Figure 5, the Erechtheion of the Acropolis of Athens in Greece is shown on a gigantic screen that people might encounter in the middle of desolate highway in the Western United States.

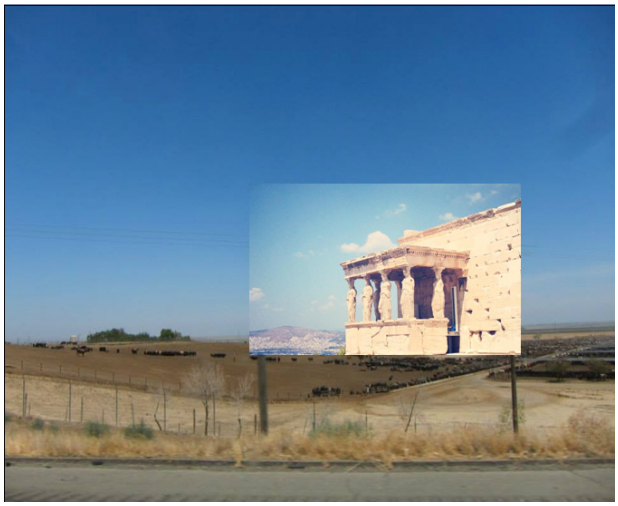

Figure 5

It is overlain with girls in traditional Thai clothing seated over the pediment of the Erechtheion and Tahi Buddha Statues, as seen in Figure 6 (a) and (b). This AR artwork presents the cultural collision between the East and the West, between Greek mythology and Thai Buddhism, and between distinctive figurative and aesthetic approaches in beauty and color.

(a) (b)

Figure 6

Figure 7 captures the scenery displayed through a train window. An unexpected desert scene, through which trains would never run, is projected here. In addition, Japanese signposts and the electric wires that run over roofs in Japan are seen from other train windows.

Figure 7

This image is mixed with Thai girls and a noble woman in a Rococo court costume sitting on camels, as seen in Figure 8 (a) and (b).

(a) (b)

Figure 8

The final art gallery space is situated in the entrance of Ando Tadao's Genius Loci, located in Seopjikoji of Jeju Island in South Korea, as depicted in Figure 9. The deep blue sea onscreen shows a relaxing beach in Croatia.

Figure 9

In contrast to this laid-back vacation scene, Figure 10 shows two women divers of Jeju Island walking out of the sea after their daily routine of gathering seafood from the deep water. Through AR technology, their clear exhaustion under the weight of their baskets is placed in direct opposition to the relaxation depicted in the original image.

Figure 10

REFERENCES

[1] Mackay, Wendy E., (1998) "Augmented Reality: Linking real and virtual worlds: A new paradigm for interacting with computers", Proceedings of AVI'98, ACM Conference on Advanced Visual Interfaces, pp 13-21.

[2] Radu, Iulian & MacIntyre, Blare, (2009) "Augmented-Reality Scratch: A Tangible Programming Environment for Children", In the ACM CHI 09 Workshop on Tangibles for Children, Boston, MA.

[3] Fischer, Jan, Bartz, Dirk, & Straber, Wolfgan, (2005) "Artistic Reality: Fast Brush Stroke Stylization for Augmented Reality", Proceedings of ACM Symposium on Virtual Reality Software and Technology, pp 155-158.

[4] Billinghurst, Mark, Grasset, Raphael, & Looser, Julian, (2005) "Designing Augmented Reality Interfaces", Computer Graphics, pp 17-22.

[5] Prochazka, David, Stencl, Michael, Popelka, Ondrej, & Stastny, Jiri, (2011) "Mobile Augmented Reality Application", http://arxiv.org/pdf/1106.5571.pdf.

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