Combining Augmented Reality with Graffiti using Mobile Application: First Results

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Augmented Reality and Graffiti

Augmented Reality (AR) art is still in its early years, and thus there is relatively few information available (Geroimenko, 2018). This new form of art has emerged with the advent of 4G networks, and the democratization of smartphones with advanced computer vision features and online distribution for third-party applications. Manifest.AR was the first artist collective that started using emergent forms of AR as interventionist public art.
In 2010, Mark Skwarek and Sander Veenhof the core founders of Manifest.AR realized that they could challenge the Museum of Modern Art's extreme exclusivity by placing artworks inside and around the museum that would use AR (Veenhof S, Skwarek M. 2010). The public could use an AR Browser app on their mobile smartphone and point the devices' camera to scan the world.
Typically, an AR application uses geolocation and computer vision techniques such as marker tracking or image recognition software, to layover computer-generated three-dimensional art objects, allowing the audience to see the artwork integrated into the physical location as if it existed in the real world.
The use of AR art in traditional art disciplines, like sculpture and painting, appear when artists laid over the original painting or sculpture information such as the X-ray capture (Van Eck and Kolstee 2012).
In Biermann 2012, several graffiti artists used AR to create a virtual history of the famous mural site Houston & Bowery Street wall in New York City which was were Keith Haring painted the first mural in 1982. Leon Keer[1], a specialist creating anamorphic street art, since 2013, have been creating AR experiences (Leon Keer, 2013). Other artists such as Fat Heat[2] the artistic collective 'WERC', or the graffiti writer, Bond Truluv, have pushed the boundaries of this new art form in the urban space (Fat Heat 2017) (WERC 2018) (Bond Truluv, 2018). In 2018, Bond Truluv has launched a book in which some photographies have a QR code that allows the user to trigger the digital content that complements the book.
Gwilt in 2018 introduces the scientific literature the concept of graffiti with AR presenting two case studies: BC Biermann 'WYNWOOD WALLS' artwork for the Art Basel event that combines AR, highly illustrative paintings with mural artist's (Biermann 2012), and Shannon Novak Works, based on the evanescent nature of AR graffiti and its inherent difficulty to regulate compared to more traditional approaches (Novak 2013).

GraffitiArt APP

The Cooperative Holistic View on Internet and Content (CHIC) project, aims to develop, test and demonstrate a wide range of new processes, products, and services that have a significant impact on the audiovisual and multimedia sectors. These products by their nature have a clear mobilizing effect on other important sectors of culture such as management of contents belonging to the national cultural heritage based on open systems of preservation and interaction. One activity is the development of algorithms and tools, that allow defining the experience in immersive content (360 videos and AR) and research in fields such as AR graffiti.

Within the CHIC scope, GraffitiARt mobile app was created to provide artists with a framework that allows extending the artwork experience into the digital domain (using AR technology) while granting users access to artworks context information (author, conceptual techniques and materials).

To assess the framework a first mobile app pilot was implemented in partnership with Portuguese artist Guel[3]. Two artworks were selected: 'Intemporal' (Figure1) and "Tied In". Artwork "Intemporal", composed of a new graffiti and a new digital AR experience, was created from scratch to the pilot.

Figure 1 - Screenshot of the app with the experience 'Intemporal'

Figure 2 illustrates the Graphic User Interface of the mobile app. Information about artist name, artwork name, location, artwork description, images or an artist video interview is available (letters D, E, F, G, I and J). For the AR experience, in this case, a 3D animation, users need to select letter k.

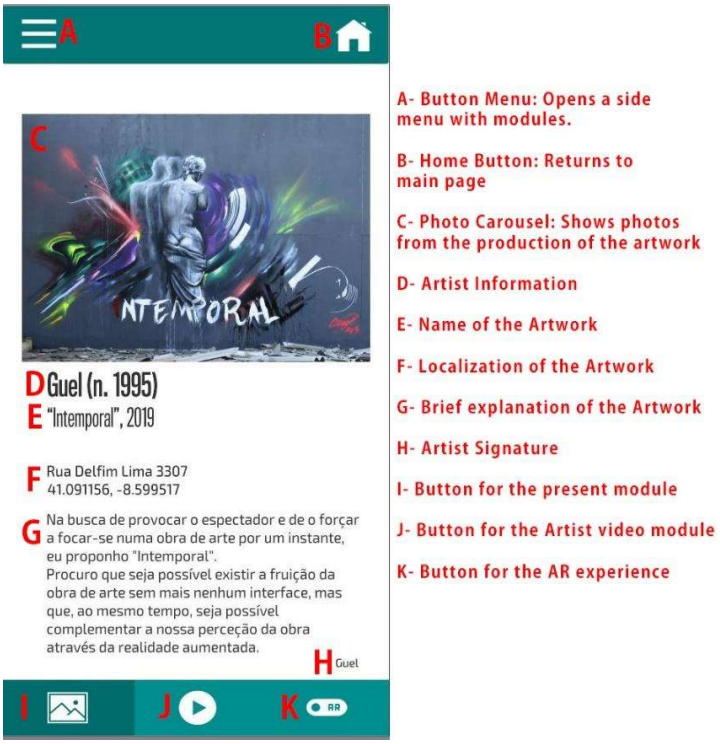

Figure 2 - Screenshot of the app GraffitiARt with Labels

"Tied In" graffiti was created in 2016 and has been tearing down over time. Thus, the experience was planned to restore missing elements (such as water pipes) and extend into the digital environment incorporating new features such as sound.

To implement the framework, it was used the game engine Unity[4], a multiplatform software that since version 2017.2, has integrated the SDK (Software Development Kit) Vuforia Engine[5], to ease the creation of the AR experiences. Vuforia identifies and tracks the features that are embedded in the image itself. By matching these features with ones in an image target database, it can detect and trigger an AR experience as long the image target is partially in the camera's field of view (Vuforia 2019).

Conclusion

This paper has described an augmented reality application to provide immersive AR experience based on graffiti artwork to the general public. A preliminary pilot to assess how an artist can explore this framework to develop new artwork or to enhance existing artwork has been concluded successfully.

The importance of augmented reality graffiti needs to be further study. The relationship between graffiti aesthetics, different artists and the urban spaces is vital and will be explored in a future empirical investigation.

Notes

[1]Ver: < https://www.leonkeer.com/ar/ >
[2] Ver: < http://fatheat.hu/about/ >
[3] Ver: < https://www.gueldoit.com/ >

[4] Ver: Unity Technologies (2019). Accessed July 29, 2019. https://unity.com/
[5] Ver: Vuforia (2019). Vuforia Developer Portal Accessed July 29, 2019. https://developer.vuforia.com/

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