Augmented Cities: Revealed Narratives

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1 Introduction

The human relationship with the environment, history, and culture is framed by our already embedded experiences and mental images—we see what we expect to see. In turn, cultural and technological context continuously forms new mental images. This continuous feedback loop is expressed by the punchline to Microsoft's HoloLens commercial: "when you change the way you see the world, you can change the world you see." This exact paradigm of mutually dependent perception and reality is at the core of the contemporary discourse on immersive media environments. While this is not a new phenomenon, but one which has occurred multiple times throughout history, current implementations seem to be more disruptive, transformative, and at the same time promising in the way they engage everyday lives and connect emotionally with users.

This paper presentation looks into interactive augmented reality (AR) environments as places where people engage with the past and experience the future; environments that subscribe to broader cultural history, evoking emotional connections with the physical world and promoting new social interactions.

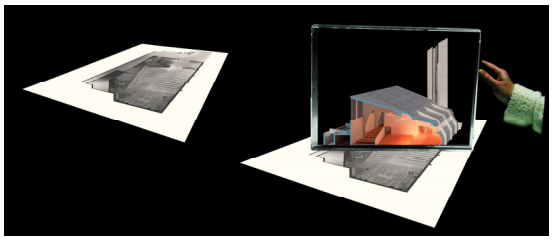

Figure 1: *Deskrama as a space browser designed for three dimensional architectural designs (Nagakura, Oshi, 2006).*

As during the Renaissance, when the discovery of visual perspective led to new concepts and organization of spaces (White 1987), today emerging digital technologies redefine our expectations for the outside reality. This has already been evident in early digital visualizations such as the unbuilt monuments (Jodidio 1999) that virtually recreated unbuilt designs or no-longer-existing structures to provide new insights about these projects. This new way of visually representing spatial environments has also triggered new technologies that allow us to analyze, dissect, and conceptualize space, often forming unexpected relationships between the virtual and physical worlds. This congruency between the physical and the digital is apparent in projects such as Digitarama and Deskrama (fig.1) that employ the established tradition of an apparatus to experience visual space as discussed by Nagakura and Oshi (2006). Similar to past inventions, current developments do not merely provide a new look into unknown space, but allow for new forms of spatial relations and conceptual connections to be made.

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2 New Modes of Seeing

Much of the current AR research focuses on the photographic and near-original virtual recreations that are situated within geographic settings (fig.2). This allows for overlaying three-dimensional photogrammetric models over geographic and historical data. A parallel lineage treats AR representations as a knowledge building and mapping exercise by Nagakura and Sung (2014). This approach follows the nineteenth-century analytique tradition where multiple drawing fragments together create a visually new and informationally interconnected. In this case, an analytique becomes a knowledge recording device where element proportions and tectonic relationships are made explicit. Nagakura's and Sung's Ramalytique project (fig.3) follows this tradition by merging multiple forms of media in a single. However, the advantage of AR technology lies in the ability to combine the conceptual and diagrammatic representation with photorealistic imagery. The former allows for compositional and tectonic relationships while the latter situates design within an actual environment and provides a commonly-accepted path to understanding the project.

Figure 2: *Photogrammetric 3D models of the tomb and tombstone at the Mt. Auburn Cemetery, Cambridge, MA.*

The *Mystery Spaces* app with embedded small photogrammetric virtual models provides a similar layering and registration of multiple media layers, as discussed earlier in the tabletop examples.

3 Look into the Future

AR technologies not only provide an opportunity to contextualize

unbuilt designs in their proper urban setting, as is the case with the AR environments showcasing winning entries for the SHIFTboston 2009 Ideas Competition in the Future City Tour app, but also provide a broader solution for reconnecting semantic layers of multiple histories and traditions. This can be seen in the *High Line AR app* (Zarzycki 2014) that provides High Line Park visitors with information on historical, current, and future developments of this landmark elevated railroad structure.

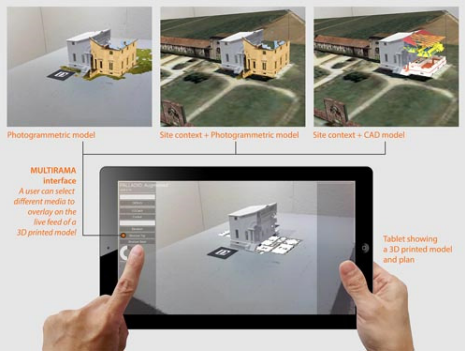

Figure 3: *Deskrama as a space browser designed for three dimensional architectural designs (Nagakura, Sung, 2014).*

The location-aware functionalities allow for positioning and filtering relevant data based on the user geolocation. They can visit a particular section of a project and freely navigate through historic photographs and future design proposals. These multiple layers can be individually accessed and combined to provide an individualized perspective into the project. To some extent this media overlay provides a third alternative to "renovate and lose the charm of the past" versus "keep the past untouched and do not adapt to new uses or current needs."

4 Situated and Gamified Histories

This is also the case with the AR environment called Mystery Spaces developed by the Tremont Underground Theater Space (TUTS) initiative. This AR app is using gamified virtual tourism media not only to popularize ideas of the adaptive reuse of the abandoned public infrastructure but also to build social constituency and connect with the general public. The Mystery Spaces AR app encourages users to "[b]ecome an urban explorer and discover the mystery of abandoned public infrastructure, secret tunnels, bridges, architectural landmarks and rooftops. Navigate through the unknown, forgotten, and underappreciated public spaces. Document their daily lives and share them with the rest of the world. Discover what architecture guides can't tell you!"
Mystery Spaces is an interactive, locative (context-aware) app for urban adventures. It engages players in mystery-solving-like pursuit with the goal of slowly revealing the secrets hidden within a city. As a game, it gives a new edge to traditional scavenger hunts or geocaching activities by providing engaging ways to unlock hidden clues and visit forgotten urban jewels. Unlike traditional offline games, Mystery Spaces allows players to contribute the knowledge about the city (fig.4).

From individual AR apps overlaying the physical world with context-aware information (High Line AR app) to broader repositories of geo-located data and Web sites/apps, such as the Museum Without Wall by cultureNOW, the established physical edifices such as museums and galleries start losing their exclusive role as cultural disseminators. While there is a significant appeal in seeing an original artwork in the controlled environment of a museum, there is also a sense of loss when the artwork is uprooted from its original cultural context and presented as a context-less object. Situating cultural artifacts in their proper context could lead to a greater appreciation of their value by the public as well as to forming new conceptual and semantical links with new interpretations.

5 Final Thoughts

AR has brought the virtual and the physical world closer and made them highly interconnected and interdependent through location awareness, enhanced data overlays, and user-focused content. AR technology increases the synergy between the virtual and the physical worlds, making them more interconnected and interdependent through location awareness and user-focused content. Participants in these AR environments not only visually experience static information but also interact with data and author it in highly dynamic and synthetic ways. These interactions promote an environment of increased user participation with the benefits of experiential learning and the authorship of the public realm.

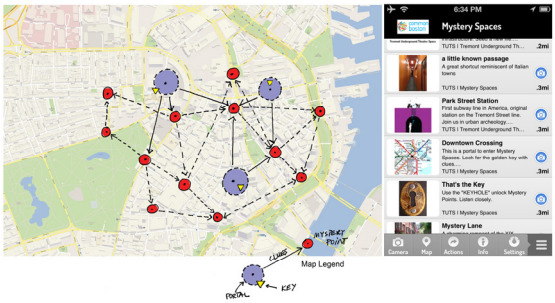

Figure 4: *Mystery Spaces, a map with POIs arranged in the form of the game play. Multiple routes lead through the AR environment. (Left) Individual POIs (Right).*

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