Augmented Urban Experience through Mediated Spatial Narratives

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Abstract

We investigate city encounters, mediated through digital interactions, and offer new ways of connecting people who occupy public space to their environment. Based on our study we provide reflections for designers of similar hybrid urban experiences.

Author Keywords

Urban Space, AR, locative media, spatial narratives.

ACM Classification Keywords

H.5.m. Information interfaces and presentation.

Introduction

Public places in the city can act as "encounter stages" upon which people perform various interactions of a spatial and social nature. Individuals' actions in different situations seem to turn into a performance that is framed through socio-cultural conventions. In this paper, we explore new ways of experiencing urban environments and investigate types of shared encounters in the hybrid city.

According to Goffman, performances in everyday interactions are shaped by the environment (place) and the audience [3]. What form these interactions may take is influenced by the affordances of the space within which the performance takes place. Like space, technologies can mediate interactions.

Figure 1

How can locative digital media be used to enable rich encounters within the flow of our city's invisible digital information? What happens when new platforms for rich hybrid encounters are provided? How do these alter perceptions and change experiences of the city?

In this paper we present the Augmented Urban Reality Project, a mobile augmented reality experience developed by University College London in association with augmented reality specialists, Holition. The project was tested during the Leytonstone Arts Trail; an annual festival of arts in East London (4-13th July 2014). Our aims were to explore alternative ways to experience and engage with the city using augmented reality, and to increase interactions with the participating artists and their work (Figure 1).

Exploring something beyond simply overlaying points of interest POIs, floating post-its or 3D models on a display, we demonstrate a new urban AR experience. Providing visual and spatial orientation, and an immersive and intuitive experience, our approach supports a physical and digital spatial narrative as people move between the various art trail points.

Augmented Urban Reality

Our approach was inspired by the Penguin Navi, of doAR that created an application to guide users to the sunshine Aquarium in Tokyo [2]. The Penguin Navi mobile app enables outdoor and indoor navigation, which is based on e-markers with the challenge to "Find the next Penguin". Once the marker is found, the corresponding latitude and longitude coordinate adjust the location of the smartphone.
In our work we consider public interactions and experience through digitally augmenting the urban

experience. We use GPS and the digital compass and a 3D model of Leytonstone area to support navigation and explore how to develop a compelling experience through the combination of the visible and invisible spatial and social narratives, which are supported with this medium.

In this paper, we focus on the potentials and challenges surrounding digital augmentation of 3D artefacts and urban environments and how this might influence the public experience of urban space.

Setting the scene: the context

We ran the experience in Leytonstone where people could choose one of 25 different art venues to explore. The system, activated in a relatively small area such as Leytonstone, would find the shortest path from any covered location to a selected final destination (Figure 2). The system supports two navigation modes: map view and AR view. Users can switch between modes by pressing a button on the mobile device (currently developed for IPhone and iPad).

2D Map View and 3D AR Experience

In the map view, the system chooses the shortest path between the user location and the selected venue and shows a path over a 2D map. This mode is similar to 2D navigation systems in mobile devices, such as Google Maps, where the user can see his/her location in real time, the destination and the route to follow.

In the AR View the user has the choice to enable or disable a 2D map overlay, registered to the real visualized world (Figure 3). The AR view uses a walking 3D digital character to guide the user in the exact direction of the selected venue, following the pre-

Figure 2

Figure 3

Figure 4

planned route. The character responded to the users' movements, altering its pose, speed and animation based on the users distance. The aim is to create new spatial and social narratives and engage people with invisible aspects of their environment through the animated character's movement and behavior.

The Experience

During the Leytonstone Arts Trail more then 130 people downloaded the app and used it as a medium to access more content from the event. During 4 days the researchers engaged with passers-by, introduced the project, and helped them installing the app to their devices. We gathered 28 questionnaires of people that were using the app who gave feedback about the different features, such as the User Interface, the AR navigation and sharing pictures with a Live Gallery.

Potentials and Challenges

Based on feedback received from participants we identified the following aspects:

Movement and the urban scale: The speed of the digital character influences the user experience and its rhythm. We noted that some users adapted their pace to match that of the digital character. Potentially we would explore varying speed, such that the digital character moves and adapts smoothly to the user. Although the digital character is aligned and integrated in the real environment, we could introduce digital cues on the AR view to give a more realistic idea about the exact scale of the digital character and the real distance between both the digital one and the user.

Hybrid Space: As the digital character moves through an urban space it can trigger things of the digital world

that are invisible on the real world. Here, it works as a link between the physical and the digital world, and is constantly calling the user's attention to relevant things and information in the environment (Figure 4).

Multi modal interactions: Some users said it would be interesting to have different animations, audio cues or immediately changing to different modes of display. With regards to the mobile devices used, some tablet users said that they would prefer a lighter, more discreet and portable device like a mobile phone instead of a heavy and attractive tablet, in particular because of handling and safety issues.

Awareness of the actual environment: This seems to be a very important aspect. Possible risk might not be noticed, such as when crossing a road. The digital character could give a warning or a hint on the screen when getting closer to cross the road.

One key element of this experience is the orientation: contrary to the conventional 2D maps, where the user might feel lost if he or she doesn't know the area or has difficulty orienting, the immersive 3D mediated experience supports natural navigation "it shows me buildings around me… it takes me into a place where I'm very oriented"; "it was a brand new way of navigation to me… there was a restaurant, and without the app I would never thought of entering".

We identified 3 crucial moments of interaction during the navigation experience. The first moment is related with the first moments of interaction, where the user might not know that a digital character will guide him or her. The second moment is during the entire route

and the third moment is when the user reaches the destination.

When to engage with the digital character: We could further explore different ways the digital character engages with the user during the first moments of interaction. Sometimes a user started the navigation looking in the opposite direction, and might not have been aware they need to reorientate the device to find the digital character.

During the second moment, we could further explore adding some personality features to the digital character, eg speaking with the user, drawing the user's attention to information about the surrounding area and places to visit. Some people said that they would also like to customise the 3D character.

The last moment could be explored with a different animation of the digital character, adding sound information or changing to a different mode of display.

Overlaying an addition environment (eg a 2D map overlaid on the AR view): it seems that people would like to have the option of a map, but not directly overlaid, unless more transparent, providing an unrestricted view of the area. A small navigation map on the right or left side was also suggested.

In summary, our approach offered a digital platform that facilitates various urban interactions. As part of our ongoing work we are addressing those aspects highlighted by users during the Arts Trail. Specifically, we are looking at how navigation is enabled by the built environment and how this could be enriched with digitally augmented spatial and social narratives.

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