ABSTRACT

In this paper we introduce the concept of a performative sharing framework to promote the regeneration of heritage sites. We discuss our reasoning for the use of such technologies in this context, considering the opportunities for exciting new interactions and experiences. Throughout the paper, we make reference to the Hafod-Morfa Copperworks—the heritage site where this framework is to be deployed. On-site, we imagine visitors being given the opportunity to play a larger participatory role, being able to craft and control not only their own experiences, but also other’s through a range of public control and feedback mechanisms. Taking into account some of the novel, public experiences that are possible through performative design in a heritage setting, we also foresee a new relationship between spectator and performer, with the introduction of a contributor. This contributor role has the potential to assist an underlying issue with a large number of heritage sites and other similar visitor attractions.

Categories and Subject Descriptors

H.5.m. [Information Interfaces and Presentation (e.g. HCI)]: Miscellaneous

Keywords

Performative, Heritage, Regeneration, Contributor

1. INTRODUCTION

In many heritage, archaeological sites and similar visitor attractions, technology has now established itself as fairly commonplace. Along with the traditional, signposted information points, nowadays, a visitor may expect to see a QR code or an application that can link them to a digital world of information and visualisations (e.g., See http: //www.historypoints.org/). The growing use of internet connected smartphones makes these kinds of solutions not only viable, but also fairly low cost for such attractions as the infrastructure already exists.

Within these kinds of attractions, we have identified two key aspects that performative technologies may help to improve. The first potential issue that we have identified with current heritage sites is their ability to draw the same visitors back multiple times. One can imagine that when a person has visited one of these sites once, they have experienced all the available information and that they have little to gain from coming back again. To encourage such people to visit again, there needs to be a constant supply of fresh media or exhibits—a reason to go back. People have so many of their own interesting stories to tell, pictures and videos to share, so why not build them a platform where they can contribute their side of the story or thoughts to the site? This kind of framework would help to solve the problem of content renewal and would encourage visitors to contribute what they find interesting.

The second key aspect that performative technologies can bring to heritage sites is a sense of belonging, involvement and inclusivity [1]. By involving visitors and bringing the experience closer to them, it may make them feel as though they can relate to the site more. There are multiple ways in which visitors can be given a more connected experience at the site. As well as being able to contribute their own stories to a site, they can be put in control of the things that occur on site. They should be able to take a role, control and be part of the experience on site. Such large performances have a possibility of creating lasting, memorable experiences for not only the performers, but also the spectators.

In this paper, we introduce the idea of a performative sharing framework based around the use of a internet connected smartphones and interactive technologies embedded in the environment. We have chosen to focus on smartphones as they have the ability to sense, record media, send or receive this information and control any other internet connected device. All of these things make the smartphone a small, yet powerful tool for both creation and control.

2. BACKGROUND

In terms of indoor location-based services for visitor attractions, QR codes have been a useful and easy way of detecting a visitor’s current location, presenting relevant information on the exhibit the visitor is currently observing [2]. Outdoor location-based services for visitor attractions usually achieve this same task through the use of GPS [5] [10]. This can offer a less complex interaction for users, where they do not need to check-in or register their location with...
the system. Once a system is aware of a user's location, there are many different ways in which content can be retrieved.

The Roaring Navigator [10] was a mobile application that gave visitors to a zoo an idea of the locations and distance of animals through spatial audio. The system could be used for both the discovery of animals, and navigation towards them. To avoid groups of visitors feeling isolated, sounds were synchronised across devices to create a group experience. One outdoor cultural heritage specific application that made use of GPS was The Virtual Excavator [5]. Here, McGookin et. al developed a multi-modal approach to investigating an archeological site with very little remains. Using a range of spatial audio, visual and haptic interactions and feedback depending on a user’s location, groups of children were encouraged to explore the site and uncover artefacts that had been found on-site previously. One of the key findings in this research was that the distribution of physical remains heavily impacted user’s exploration, with user’s gathering around these remains, reluctant to search further afield.

Audio is a popular way of conveying information to visitors at such attractions as it offers an eyes free interaction that allows the user to focus on their surroundings. Although audio has these qualities, visual feedback can also offer realistic and engaging experiences. In recent years, there have been many attempts to visually recreate buildings and entire landscapes through augmented reality. Two of the first attempts to do such things were The Augurscope [9] and Archeoguide [11]. Both of these systems were developed to recreate ancient buildings and characters. While Augurscope offered a group experience with users able to wheel a large screen around on a tripod, Archeoguide was a more mobile version that allowed individual visitors to wear virtual reality goggles and a backpack. In recent years, innovations in mobile technology make this kind experience possible in a much smaller package (e.g., See Aurasma http://www.aurasma.com/).

As well as receiving feedback through mobile devices, a number of more performative, public experiences have focused on delivering feedback on a much larger, external scale [7, 8]. Ambient Wood [7] was a project that aimed to get children to learn about their natural surroundings in a fun and engaging way. In this project, though environmentally-initiated, wireless speakers were used to play the pre-recorded sounds of insects and animals in the wood. MobiSpray [8] is an example of a large scale, performative projection experience. Users of this system were given a mobile device to use as a creative painting tool. As the user of the system created a design with the device, the design appeared projected over real world objects.

In [4], Goffman defines our behaviour and everyday interactions with each other as a performance. In this paper, we consider some of the kinds of performance that are possible when using technology, where a user’s interactions and/or the effects produced are somehow observable to spectators. This is a topic which has been discussed in detail by Reeves et. al [9], with the introduction of a spectator-performance observability taxonomy. Dalsgaard and Hansen [3] extend this conversation with a review of performing perception - how performers themselves think and behave in such circumstances. In [1], Gaynor Bagnall indicates the importance of performance and performativity at heritage sites. She argues that at such sites, they are key social practices, and that “the relationship between visitors and the sites is based as much on emotion and imagination as it is on cognition.” At the two heritage sites where the research was carried out, Bagnall claimed that performing was useful to help stimulate reminiscence through emotionally engaging visitors.

3. PERFORMANCE FOR HERITAGE SITE REGENERATION

As part of a multi-partner project [4] we have been tasked with developing novel technologies to engage visitors and bring the past back to life at the Hafod-Morfa Copperworks in the Lower-Swansea Valley, Wales (See Fig. 1).

![Figure 1: The Hafod-Morfa Copperworks](http://www.welshcopper.org.uk/en/Cu@Swansea.htm)

We are interested in regeneration in particular because the Hafod-Morfa Copperworks is currently an unused and unloved space. Until recently, the site was completely derelict and had not been used for many years. As a site that was not only of key importance to the industrial revolution in Wales, but the entire United Kingdom, such an end does not befit a site of such world importance. As renovation works are only now beginning on-site, many areas are currently inaccessible to the public and there is next to no interpretation for visitors. To make the site a pleasant and usable area for the public, we need to consider how we may bring it back to life through a careful blend of renovation and regeneration. By using performative technologies at this site, we hope to facilitate a forum for regeneration, where people can visit the area, experience it with some sense of ownership and responsibility and leave their mark there.

We believe that performative technologies are right for this role as they enable visitors to become producers, as well as consumers [1]. Such technologies allow visitors to move across the divide, from merely a spectator to a performer, shaping not only their own experiences, but also others at the site. Situating speakers and projectors in the environment gives us the ability to create expressive experiences, taking visitors back to a previous time in history. These kinds of public, augmented reality experiences will potentially play a key role in bringing the past back to life. By making these technologies publicly controllable, we are attempting to facilitate interesting, immersive and enjoyable experiences, where the visitor feels as though they are a real part of what is going on at the site.

Having interactive technologies where people are able to participate collaboratively and control public performances
is all well and good, but one of the main concerns we have with museums and heritage sites in general is that exhibits are rarely updated, leaving little reason to visit again. With the static nature of such places, one would expect to receive the same experience when visiting a second time.

To overcome this limitation, we propose the introduction of a contributor role in such places. The introduction of this role again encourages visitors to move between the consumer-producer divide. As a contributor, visitors are given the chance to give something back to the site. Although the historical accuracy of visitor contributed content cannot be guaranteed, it can offer interesting new perspectives from an individual or group. It may be the case that people are interested in experiencing interpretation through the thoughts, stories and images of other visitor’s perspectives.

Archwilio is a mobile application that supports this idea, encouraging users to collect and contribute information about archeological and heritage sites in Wales. Early user reviews of the application have been fairly positive.

4. DESIGNING THE EXPERIENCE

In the following subsections, we envisage the different components required in a performative sharing framework for heritage site regeneration. Each device at a heritage site will be required to connect to a central server where all content and requests are handled. This means that the framework exists physically as a client-server based architecture, where input affects it. For this reason, we suggest using projections and requests are handled. This means that the framework exists physically as a client-server based architecture, where all connected devices can act as input and output clients.

4.1 Feedback

We believe that the key to showing and telling visitors what a heritage site once was, is having amplified, publicly available feedback for all to see and hear. One of the benefits of this approach is that in the case that someone does not have a device capable of directly interacting with the framework, they can still experience the media as spectators of a performance that someone else is controlling.

4.1.1 Visual

To enhance the realism of the experience on-site, we believe it is important to attempt to mask, or put little emphasis on the physical technology producing feedback to make it ubiquitous. Instead, visitors should be able to focus solely on the effects being produced, and the way in which their input affects it. For this reason, we suggest using projections as a form of public, visual feedback.

We have already carried out some initial studies using pico projectors in a visitor centre context. Here, visitors were given the opportunity to overlay the environment with projected plants, insects, animals, rain and fire. Early findings suggested that this kind of performative projection enriched the shared experiences of visitors and drew in bystanders.

4.1.2 Aural

Continuing with the theme of ubiquitous computing, with regards to aural feedback, we have experimented with using loudspeakers out of sight and playing contextual sounds, it is possible to design a powerful and immersive experience. Our early results in this area suggest that public audio is a good way of gaining the attention of bystanders. Further research in this area will look at using contextual sounds in a heritage context, and also harnessing existing infrastructure such as visitor’s mobile devices, creating a collective speaker.

4.1.3 Further Possibilities

Although we have only touched on visual and aural forms of expressive, publicly accessible feedback, there are a whole range of other modalities that one may choose to explore. How can public haptic feedback be incorporated into such experiences? In terms of olfactory modality possibilities at the Hafod-Morfa Copperworks, one suggestion would be to produce the smell of smoke and heavy industry.

4.2 Control

Technologies embedded in the site such as speakers and projectors should all be accessible and controllable by visitors over a network connection. Because of the widespread use of internet connected mobile devices, we see them as an ideal control device for connecting people to the framework. The control of these embedded technologies forms the performative interaction aspect of the framework. On-site, we see the mobile device being used as an all-controlling kind of magic wand. The following subsections discuss some of the different opportunities when using a mobile device as a controller in a performative framework.

4.2.1 Personal Control

In terms of a personal control, we see opportunities to access content and interact with these technologies embedded in the environment on an individual level. As an example, imagine a collection of loudspeakers placed in and around buildings at an industrial heritage site. Each of these speakers makes a sound reminiscent of the building in it’s heyday; for example, smelting, hammering, burning etc. To control what a visitor would like to hear, they must point at it. At the Hafod-Morfa Copperworks, visitors would point their mobile device at a building in order to hear the type of work carried out there.

4.2.2 Remote Control

As every device on the site has the potential to connect with each other, we see a great opportunity for remote control applications. One such example is a method of sending directions to another person on-site. Using gestures, one visitor would be able to direct another on a path, possibly to show them something they may have missed while walking around. On a larger scale, this kind of interaction could be used to connect to large groups of people and give a collective guided tour. A two-way link between devices could even be used to start conversations, sending images, videos or audio recordings back and forth.

4.2.3 Collaborative Control

The ability for all mobile devices to connect to the framework also offers an opportunity for collaborative control. Building on a previous example, collaboration could occur by many users controlling multiple speakers in environment. Perhaps the more users that point at an individual speaker, the louder it would get. More generally, we see collaborative control as an opportunity to build a bigger picture, or to achieve a collective goal. A more performative example of collaborative control could be acting out historical events.
that have occurred at the heritage site. Considering a past event at the Hafod-Morfa Copperworks, one can imagine visitors with mobile devices taking sides in a strike. Shaking their device in their fist in the air signifies that they’re angry. The more visitors that join in, the speech of the copperworks owner John Vivian is drowned out. If they decide to stay still and listen to the speech, the speech would then increase in volume.

4.3 Contributor Role

A mobile device such a smart phone allows a visitor to capture a whole host of different media. Using mobile devices, we will allow visitors to contribute comments, audio stories, images, videos and more. In such instances where visitors are given powerful authoring tools, designers may need to consider measures to counteract malicious or offensive content. A simple method to regulate content would be to have a verification step that is carried out by a trustworthy person, though this may become arduous as the number of contributions increases. Another solution would be to use a more democratic approach, where visitors themselves can vote content up or down depending on its likability. Although regulators should aim to remove undesirable content, a set of simple guidelines should be produced to ensure that there is a coherent definition for what constitutes ‘undesirable content’. It may be the case that the heritage site welcomes more general contributions from the community, some unrelated to the site. This media collected from contributors will form a central media palette.

4.3.1 Media Palette

The term ‘media palette’, is a friendly metaphor for what will essentially be a contribution archive. Each contribution will be catalogued in an online database, alongside the relevant meta-data. In terms of browsing the palette, the simplest method would be to let visitors have access to the entire archive. Although this would be the easiest solution to implement, it is not necessarily the best. It is quite likely that over time, the media palette would become too large to access in its entirety. Simple filtering techniques could be used on the meta-data to keep content relevant to visitors, retrieving location or context specific content. Visitors should also have the ability to tag content, linking it to other relevant media contributions. In terms of the user interface, when first opening the media palette, a user could expect to get multiple content suggestions based on their location and context. Users would also be presented with the ability to search. Once the user finds an interesting piece of content, they should be able to preview and use it, or continue to navigate further through linked content. The same interface would be used for contributing, with a ‘capture mode’ that allows visitors to contribute media, specifying linked content and meta-data. When retrieving content, visitors should have the option to experience audio and visual palette contributions privately through their mobile devices, or publicly through the networked feedback peripherals on-site.

5. CONCLUSIONS & FUTURE WORK

In this paper, we have introduced the concept and reasoning behind a performative sharing framework for heritage site regeneration. We introduced the notion of a contributor - a visitor who actively chooses to contribute new information and media to the framework. This ongoing stream of contribution forms a constantly refreshing media palette, ensuring visitors have a reason to come back to the site. By combining the contributor role with a range of public, performative technologies controllable by the visitors themselves, we have defined a framework that not only enables visitors to become producers as well as consumers, but also one that allows visitors to experience a more personal connection with the site. We propose that a performative sharing framework such as the one we have outlined here, would help to revive and breathe new life into a forgotten heritage site that is in need of regeneration. By introducing this kind of framework to the Hafod-Morfa Copperworks, we hope to generate a sense of immersion on-site, improving participation and engagement.

Our future work will focus on developing, deploying and testing a fully working, performative sharing framework prototype at the Hafod-Morfa Copperworks.

6. REFERENCES