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Elisa Giaccardi, Editor

Local Connections: Designing Technologies for Discovery and Creativity Within the Community

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Historical artifacts, places, characters, and stories exist in all of our local communities, yet they are often ignored, or seem invisible, as we go about our daily lives. At the same time, it may seem as if our sense of local community is slipping away, and that modern technologies are partly to blame. As we grow more connected within digital communities that span the globe, it's easy to lose sight of local places and issues.

Mobile technologies can distract us from the fascinating details of places we pass through, but, conversely, they can also open up enormous potential for creating and interacting with location-related information. The Web is as much a tool for finding and sharing locally relevant information as it is for global communication, and we are only beginning to explore the possibilities this holds for localized engagement. Following the wider movement from static Web pages to user-led content creation and discussion, novel systems should be built to engage community members in developing local content, exploring local issues, and uncovering or creating stories that provoke a sense of what places meant in the past and what they could mean in the future.

Here we discuss the Mill Road Discovery Project, in which technologies for exploring and creating with local heritage were developed and evaluated with local groups. The goal of the project was to enhance community engagement with a large disused cemetery site by supporting the development of new perspectives on the place and its past, present, and future.

Places, Stories, and Meaning
We often look to agreed-upon sites of great historical importance as the basis for our heritage, missing the rich narratives of social and natural history all around us. In this project we used a combination of mobile and indoor technologies to support a more localized relationship with heritage. An inspirational example of this kind of work is Murmur (http://murmur.info), a site where personal accounts of local buildings and streets are brought to life through oral storytelling by residents, showing that this heritage can be presented in a meaningful way that engages both the storyteller and the listener. A further inspiration is Schutt's Small Histories project, developed to support the creation and sharing of personal biographical stories using multimedia. Links between these stories, such as a shared location, are made visible to writers and readers [1]. Cosley et al. note that visitors come to museums for meaningful social experiences, as well as for learning. Technology in these settings should take users away from their everyday lives, have the potential to make social connections visible, and support wider reflections on the experience through active participation [2]. If we can extend this kind of approach beyond formal museum spaces, technology could transform a walk down the street into an

active interaction with local heritage. Rather than formally taking us *out* of our everyday lives, it could allow us to create and experience stories that provoke reflection on the history *within* our everyday lives.

In all of our communities, there are places that do not receive the attention they deserve. The rich history they represent might not be on our radar screens as we pass through them during the course of our busy everyday lives. Such places may sit at a crossroads of purposes, where past grandeur is fading, unnoticed. Perhaps no one is giving them the attention they deserve. Perhaps some people do care and work to preserve the place, but they feel invisible to the wider community. Mill Road Cemetery in Cambridge, U.K., is such a place. A large, publicly accessible cemetery, it is rarely used for new burials.

The site is slightly hidden from the busy shopping streets surrounding it. Some local people use it almost like a park; others walk and cycle through it on their way to school. There are a large number of old monuments and gravestones, some with beautiful carvings, others crumbling away, overgrown with nettles or layers of moss. A number of church parishes share responsibility for the site, while the city council and a local volunteer group—the Friends of the Cemetery—also work to maintain it. It became clear to us that Mill Road had a lot to offer its community as a source of local history, and we wanted to explore how novel technologies could further this engagement. In particular we were keen to investigate how to design a system that was sensitive to place, heritage, and community, aiming to improve

engagement with the place itself and among the community that lived around it.

The monuments and gravestones of a cemetery can provoke countless questions, insights, and stories. The engraved dates that make us realize that a child died at a very young age; the inscriptions that make us wonder about the lives of the people who were left behind; the relation to wars, plagues, and poverty. Gaps in our understanding invite inquiry: Why are there fewer ornate gravestones in this area? What was life really like for this person? Why is their gravestone inscribed with this particular statement?

The rich, multifaceted experience of the physical place provides further inspiration: The situation of the cemetery in an evolving urban space; the people passing through and how they use it; and the range

of flowers, plants, trees, and animals that have made the cemetery their home are all grounds for discovery and for creating new interpretations and stories.

Communities

Institutions, volunteer groups, and individuals form a complex social fabric of local communities. In the case of Mill Road, a society of volunteers and friends exists with multiple interests, including area history and site maintenance. In addition,

munity members attended multiple sessions, as their interests crossed boundaries—for example, the green spaces officer of the council was interested in the history investigation, the growth of trees recently planted by the council, and raising awareness for the site and its caretaking needs by getting schoolchildren involved.

The Discovery System

The system consisted of an ecology of devices that would support

a map tracking the activities and created content could be viewed alongside relevant preexisting documents (see Figure 2). Indoor users could communicate live with those roaming outside and do background research to aid their explorations. Moreover, those indoor users were better placed to investigate parish records, look through old newspaper clippings, or consult with old maps on the historical layout of the site. Taken together, this collection of devices allowed groups to
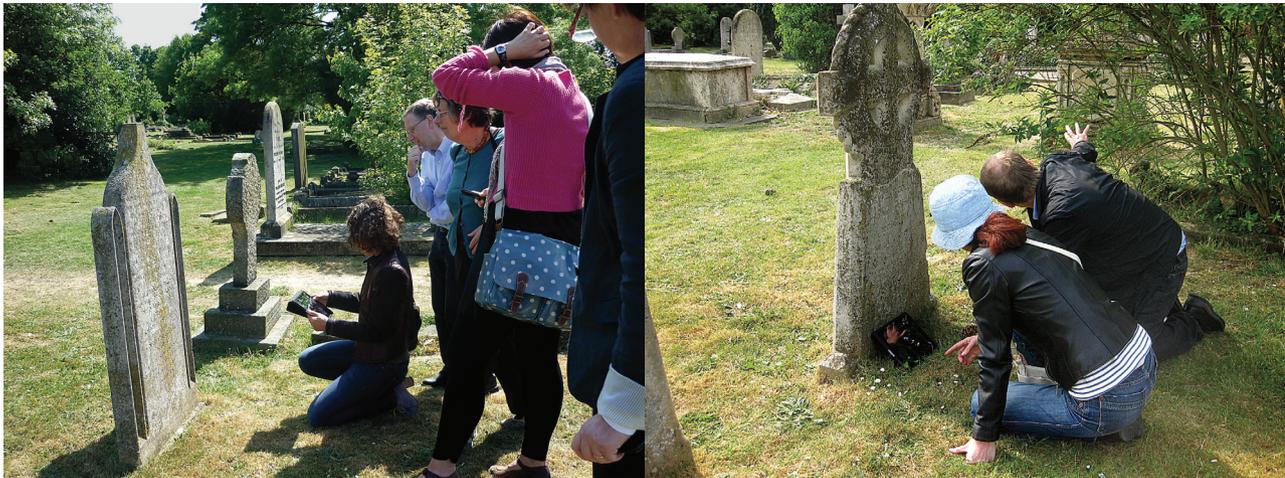
► Figure 1. Working with tablet computers and exploring the cemetery.

we found that a nearby school wanted to engage its pupils with the cemetery as a source of inspiration in their drama studies so that they could start writing their own plays about people from the past. Furthermore, a society of bioscience students from a local university frequently met at the cemetery to study its flora and fauna.

We engaged with each of these groups to design a shared discovery system and to consider the activities in which they would partake around it, allowing them to explore the place in their own ways. Each group then took part in an event where they used our system for at least two hours. In some cases com-

new activities in relation to the site. Based on suggestions from the user groups, we repurposed an existing set of hardware and bespoke collaboration tools, originally designed and evaluated in the context of educational field trips [3]. Mobile devices, such as tablet computers and smartphones, were provided to local groups so they could roam around the cemetery, take photographs, make notes about findings and observations, access information, and communicate with others (see Figure 1). A few minutes from the site, we took over a room in a university building as an indoor reflection space. This featured a tabletop computer, through which

start weaving pieces of information together and to start creating their own stories.

When interfaces are designed for located creative interactions, rather than for passive guidance, new design issues emerge. There remain difficulties in connecting the physical world with content. For example, as users aimed to link records about people buried in the cemetery to GIS data that accurately pinpointed grave locations, there were cases in which positions were misinterpreted on the ground and corrections were necessary. Approaches to supporting three-dimensional interactions with the real world from the perspective of the mobile

user—such as augmented reality—appear to be well suited to these applications. A major challenge going forward is to support users to create content items through these interfaces and link them to small features of the environment.

Perspectives on Local Inquiry

Through our work we wanted to support heritage experiences beyond the boundaries of formally curated spaces. Unlike a more traditional visit to a museum, these experi-

of experiences across time and spaces. The richness of the physical environment provokes serendipitous moments of discovery—it can be poignant to see a physical grave site, notice that the person died so young, and record this. Looking at a list on a computer does not replicate such an experience, even though it conveys the same basic information. Different representations of local information and contrasts between the richness on site and reflection away from it are all

them. The team indoors confirmed that they were on the right track. They set out to find more such graves and stumbled across a grave that was overgrown with grass. Along the edge of the grave, they discovered the barely legible name of a young man who died in 1917. The name of his regiment was there as well, and it indicated that he was from New Zealand. Carefully moving grass out of the way, the boys knelt down to photograph this grave **(see Figure 3)**.

They reflected on what life might have been like for this young

▶ Figure 2. Reflection and discussion in the indoor room.

ences should encourage local community engagement and inquiry. Fundamentally, they are about creating and sharing perspectives on heritage with a do-it-yourself ethos, rather than following the steps of a preplanned experience. In this way, personally and socially meaningful activities can be achieved.

Schutt notes that it is through various forms of interplay between time and space that narratives gain their power [1]. By combining mobile support for recording first-hand experiences at the cemetery with the ability for others to interact with these recordings and add their own contributions from a distance, we provided different kinds

important in supporting creative interaction with heritage.

The following vignette recorded by a researcher following the users shows an example of the richness of these experiences:

We followed three boys on their roam around the cemetery as part of their drama assignment. One of them started reading out the dates on the gravestones around him: "1857... 1899... I suppose these are no good for us?"

Their teacher had asked them to locate the graves of WWI soldiers. The boys started discussing dates and years of the world wars, and worked out that they were looking for the graves of those who died between 1914 and 1918. They found two such graves and photographed

man—coming all the way from New Zealand, to end up dying in England. How had he ended up in this family grave? Had he married a girl from this family? Had they befriended him? The act of trying to record and photograph a grave meant that it took on a different meaning and formed the beginning of a story. Later on, the same group was working indoors, looking up the regiments of buried soldiers—where they had been, when, and what type of action they had been involved in—and one of the boys mentioned how it was odd—

that when you are in the cemetery, you only think of the person's death—where they died, when and

▶ Figure 3. Investigating small details.

how they died—and yet, when you look into it more, you think of their life. For my drama course I need to find out about their life; otherwise I can't write the story.

This highlights some of the tensions between the gravestones as artifacts representing death, and also as representations of a life that can be investigated and imagined. It is also clear that users felt different discoveries were possible indoors. In another case, a personally meaningful discovery occurred indoors after several hours of exploration on site: Watching someone at the tabletop computer while browsing the names and images of graves, a professor jumped. He realized that a major figure in his discipline, Sir John Seeley, was buried at Mill Road. Despite working nearby, and spending significant time there on that day, the professor had suddenly found something novel about this familiar space. The discovery had quite an effect both personally and socially, with the professor going out again to verify the location, take photos, and show the site to peers. He also wrote a piece on the new cemetery website about the man, who had been a professor of history at Cambridge in the 19th century and the author of several influential books.

Values and Outcomes

Engaging a community around local places is as much about bringing people together as it is about developing new technology. The technology can have the effect of providing better resources and support for content creation, and it also can engage and make visible a legitimate event. Setting up a dedicated room at the university for reviewing and extending the captured information, combined with the visibility of people exploring the site with mobile devices, grabbed the attention of other people in the area. Rather than following a technology-driven ideal, work in this area succeeds where it attempts to bring communities together by legitimizing and supporting the practice of exploring and using local heritage.

The Mill Road Discovery project brought together people who otherwise wouldn't have met, and identified artifacts, linked resources, and generated discussions that would not otherwise have happened. In this sense it brought together the community around the site as never before. Outcomes such as imagined narratives based on historical scenarios, oral tales, and connections between past and present are valuable alongside the processes that create, reframe, and consume them. We hope that by using technology to encourage these kinds of heritage experiences we will increase the attention and care given to these areas. The teacher of the drama class expressed this sentiment succinctly:

They tell me afterwards that the place never quite stays the same to them. It remains a special place, because they feel connected to it. They feel they would always need to treat it with respect.

The events at Mill Road have given us glimpses of future visions of local cultural heritage. Local history can be personally meaningful and provide opportunities for both learning and community engagement. In contrast to museums and formally recognized sites that require extensive travel to experience history, technology can be designed to encourage people to engage in localized experiences that could form a meaningful part of their everyday lives and foster a stronger sense of community.

ENDNOTES:

1. Schutt, S. Spinning stories: The development of the small histories project as an online facilitator of multiple life stories. *Creativity and Cognition '07.* ACM Press, New York, 2007, 91-98.

2. Cosley, D., Lewenstein, J., Herman, A., Holloway, J., Baxter, J., Nomua, S., Boehner, K., and Gay, G. ArtLinks: Fostering social awareness and reflection in museums. *Proc. of the SIGCHI Conference on Human Factors in Computing (CHI '08).* ACM Press, New York, 2008, 403-412.

3. Coughlan, T., Adams, A., Collins, T., Davies, S., Lea, J., and Rogers, Y. Working with 'mission control' in scientific fieldwork: Supporting interactions between in situ and distanced collaborators. *Proc. of the ACM Conference on Computer Supported Cooperative Work (CSCW '11).* ACM Press, New York, 2011, 617-620.

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