

Supporting (Mobile) User Experience at a Rural Village ‘Scarecrow Festival’: A Formative Study of a Geolocated Photo Mashup Utilising a Situated Display

Keith Cheverst, Paul Coulton, Will Bamford and Nick Taylor
Infolab21

Lancaster University
+44(0)1524 510312

{k.cheverst, p.coulton, w.bamford, n.taylor}@lancaster.ac.uk

ABSTRACT

In this paper, we describe a novel application focus for the web2.0 paradigm of user generated mashups of geo-tagged photos. Here we are interested in photos captured by multiple participants (via their mobile phones) at a community event. Typically, current approaches focus on the production of a digital artefact, viewable on a web page, which supports a post-event reviewing activity, e.g. enabling a user to view photos (taken at the event) geolocated on a Google map backdrop. Our approach – investigated through the use of an exploratory prototype – supports participants at a community event as it takes place. The particular community event studied in this paper is that of a ‘Scarecrow Festival’ held by a rural village in the North of England. The prototype received positive feedback from attendees of the event including those who took and uploaded photos and those who watched the photos appear ‘live’ on the mashup presented on a situated display in the event’s ‘Big Tent’.

Categories and Subject Descriptors

H.5.m [Miscellaneous].

General Terms

Design, Human Factors, Formative Evaluation, Web2.0, Situated Displays, Exploratory Prototype, Mobile Phones, Geolocated Content, Community Events

Keywords

Technology probe, situated display, community, interaction, content sharing, deployment, field study, digital photos.

1. INTRODUCTION

In this paper we describe our use of an exploratory prototype to support a community event as it unfolds or takes place in ‘real-time’. The particular community event studied in this paper is that of a ‘Scarecrow Festival’ held by a rural village, Wray, in the North of England.

The deployed prototype explores a novel application focus for the geo-tagging of photos captured by multiple users attending the community event via mobile phones (with GPS capability) and the web2.0 paradigm of user generated mashups. Typically,

current approaches focus on the production of a digital artefact, viewable on a web page, that supports a post-event revisiting/reviewing activity, e.g. enabling a person that attended the event to view pictures that were taken at the event geolocated on a Google map backdrop. Examples of web2.0 based systems that support the ‘live’ viewing of geo-tagged photos include [Bamford, 2007] or the more recent <http://flickrvision.com/> (released 14th May 2007).

With the design and deployment of our exploratory prototype we aimed to support the experience of persons attending a rural community event – a ‘Scarecrow Festival’. The ‘technology intervention’ which we deployed as part of a formative study utilised a situated display to display geo-tagged photos captured by multiple attendees at the event using mobile phones. The formative study took place on one day of the Wray Scarecrow Festival on the 7th May 2007.

As part of the Scarecrow Festival residents of the village design, build and then display (typically in their front gardens) their scarecrows to fellow residents and visitors to the village. Consequently, the scarecrows are distributed across a wide geographic area – in this case a geographic area covering the entire village. Figure 1 below shows a photo of the village and a typical scarecrow ‘exhibit’.



Figure 1: The village of Wray and a typical scarecrow exhibit on show in the garden of the village residents who created it.

The Wray Scarecrow Festival lasts for a period of one week (always taking place during the first week of May) and is accompanied by special events some of which take place outside (e.g. duck herding) with others taking place inside one or more large tents (e.g. lessons in weaving).

The work described in this paper is very much of a multi-disciplinary nature, being informed by ethnographic study in order to support both ‘participatory’ and ‘user experience’ design approaches in addition to more technical work such as mobile application and web2.0 development.

The remainder of this paper is structured as follows. In section 2 we present both the technical background to this work and our

work with the Wray community over the last 18 months. Next, in section 3, we describe the formative study carried out at the Wray Scarecrow Festival. This is followed in section 4 by a description of our technical approach and the paper concludes with a short discussion and plan for future work.

2. BACKGROUND AND RELATED WORK

2.1 Working with the Wray Community

The village of Wray is situated 16km from Lancaster in the North West of England and covers a geographical area of approximately 2km². It is a vibrant community with a mix of attractive historic stone built cottages and some newer developments on the edge of the village (where farms and other rural industries used to reside). The village hosts a number of annual events or festivals and the most popular of these is the Scarecrow Festival

In 2004, Lancaster University, in collaboration with the village community, created a project to deploy a wireless Mesh network in the village providing connectivity across a large part of the village—the village’s remote location meant that their only option for Internet access had been a dial-up service. Whilst the project was technology focused (centred around the delivery of the wireless network), at the same time it created an environment for future research projects, establishing strong links between University researchers and the village community which have continued well beyond the initial project itself.

As part of our study in the village, we have supplemented traditional ethnographic techniques (such as observations, interviews, photographing community spaces) with a technology probe approach [Hutchinson, 2003], aiming to understand the needs of the community and inspire new designs, in addition to field testing our technology. One of the technology probes that we have deployed in the village (and more specifically in the village Post Office) takes the form of an interactive photo display to gather in-situ usage information and generate interest and ideas from the community [Taylor, 2007]. The annual events in the village acted as a strong stimulus to the creation of the photo display and during a visit by one of the authors to the annual Wray Fair and Scarecrow Festival in May 2006 photos were taken which would later be used in our first Photo Display deployment.

2.2 Initial Motivation

Much of our work in Wray was enabled by the help of Chris Conder, a local technology enthusiast who championed our cause to members of the community, particularly through the Computer Club which she organises. We distributed ten probe packs during two meetings with the club at the end of April and beginning of May, containing cameras and notebooks for participants to record their views on village life.

Prior to the May 2007 scarecrow event, one of the authors received an e-mail from Chris Conder:

“...we have been asked by the scarecrow festival committee if we would be interested in doing something wifi for the event this year...”

The idea of using camera phones was then suggested by one of the authors:

“...I was wondering about something involving asking people to take pictures using their mobile phone – then maybe uploading their favourite (one per person) and a judge(s) picking the favourite and offering a prize (which we could supply or chip in with)...”

The broad concept being to create a kind of interactive exhibit that would engage visitors and members of the community alike whilst also generating further content for the Wray Photo Display. Such content could then, for example, be viewed by those visitors returning to the village for future scarecrow festival events. Chris Conder was very receptive to the idea and so appropriate space in the ‘big tent’ for housing the exhibit was booked.

2.3 Mobile Spatial Interaction

There is currently much interest in the area of spatial representations of media and how such representations can lead to new forms of interaction, e.g. the recent CHI workshop on *Mobile Spatial Interaction* (<http://msi.ftw.at/>). The utility of web2.0 services to provide tools and services to support the geo tagging of media such as photos (e.g. www.flickr.com) and systems such as zonetag (zonetag.research.yahoo.com) enable a photo captured by a camera phone to be uploaded to a social site such as Flickr. Figure 1 illustrates how zonetag presents a geotagged photo on a Yahoo! map.

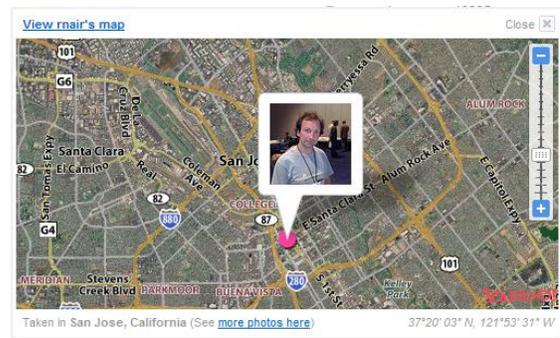


Figure 1. Example of a zonetag image geolocated on a Yahoo! map.

2.4 Situated Displays and Community Support

There is a large body of existing work in the field of situated displays, including work relating to their place with social interactions and communities, such as enticing users to interact with displays [Brignull, 2003], which provide an understanding of human interaction with displays that is relevant to any deployment.

There have been many successful situated display developments worthy of note. Dynamo [Izadi, 2003] was developed as a “communal multi-user interactive service”, with a large desktop-like environment shared by many simultaneous users, to which they could post and share multimedia content. The Notification Collage [Greenberg, 2001] likewise allowed several users to share multimedia simultaneously, with the added benefit of enabling multiple, distributed displays. WebWall [Ferscha, 2002] made use of public displays to allow users to access Web content pervasively.

Other photo-based situated display systems exist. For example, [Romero, 2003] developed a system allowing users to capture images on mobile devices and viewed on a situated display, although this was intended for private use within a home rather than public use in a community. While [Cheverst, 2005] explored mobile phone based interaction and issues of community with a photo display deployment situated in a University Computing Department.

Alternatively, [Churchill, 2004] offered an example of a situated display coupled with an online community. Their CHIplace and CSCWplace systems were deployed at conferences, using large, interactive displays that presented information from an online community. This blurring of the separation between content accessed from a home PC and content available at a public location reflects the approach adopted with this deployment.

Outside the field of situated displays, much work exists on the use of technology to support communities, including research into the notion of community memory [Rossman, 1975], in which the community determines the content of a shared data repository, existing “simply to facilitate people’s direct contact and contract with each other”.

3. THE FORMATIVE STUDY

In order to gain early feedback regarding our approach we conducted a formative study using an exploratory prototype on one day of the Wray Scarecrow Festival on the 6th May 2007.



Figure 3. Setting up the exhibit in the ‘Big Tent’ in May 2007.

Attendees to the event who showed an interest in the LocoMash display were asked if they would like to participate in the capturing and uploading of photos. The participant was then given a Nokia N93 phone with the LocoMash software preloaded and a Nokia LD-3W Bluetooth GPS (10 such kits were available for the event) and brief instruction on how to take pictures through the application and then upload them to the mashup. The Nokia N93 phone has WiFi capability and prior to the event one of the authors surveyed the village in order to ascertain those areas were the N93 could and could not obtain WiFi connectivity with the MESH network. Coverage was not complete (as expected) and so the application was designed such that pictures could be stored on the phone’s memory card and transmitted to the server when the user entered an area of connectivity.

Over the course of the day we had eight participants use the phone, although many more showed a keen interest in the artefact itself. It was interesting to observe that interest was shown by both young and elderly alike.

A sample screenshot from a view of the Wray LocoMash is shown below in figure 4 and the fully populated mashup can be accessed from the following URL: <http://www.locomash.com/view-event.php?eid=2>.

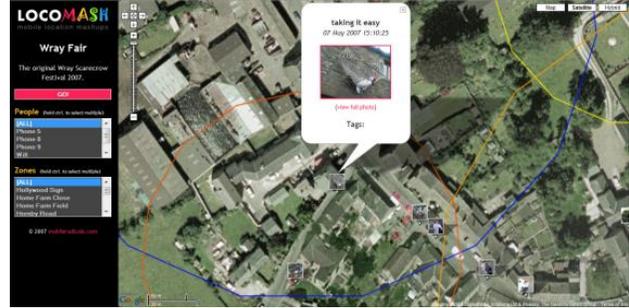


Figure 4. A screen shot taken during the Scarecrow Festival event – 7th May 2007

For the first half of the day we ran the LocoMash presentation on a 32inch Samsung LCD display and for the second half used a 19” touchscreen display – however switching displays not produce any noticeable affects on the level of interaction.

4. LOCOMASH: TECHNICAL APPROACH

LocoMash was inspired by the Mass Observation social research project of the 1950s and consists of a J2ME client application that allows you to either link up your phone via Bluetooth to a GPS unit or use a phone with an internal GPS, and then create blogs of text and pictures which are tagged with positional data such as latitude and longitude. The blog is then sent to the LocoMash website via GPRS/WiFi where it can be viewed on Google Maps. Figure 5 illustrates the interaction between components in the LocoMash System.

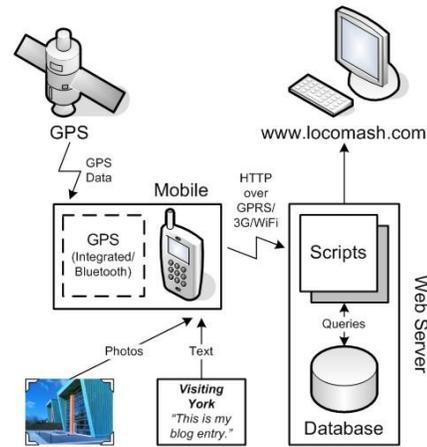


Figure 5. LocoMash System Diagram

We are currently experimenting with supporting the specification of areas (or zones) of interest in order to support the spatial filtering of the user generated content. Such zones could be downloaded to the mobile client when a user selects the particular event they wish to participate in and our hypothesis is that this will prove a flexible approach for enabling the same client and same web service can be used for any number of events.

4.1 Mobile Client

The mobile client application can be installed over-the-air (via WAP push), from the mobile phone's internet browser or via Bluetooth push (e.g., OBEX file-transfer). However, in our formative study the application was pre-loaded onto the mobile

phone in order to save time (and possible user anxiety from less tech-savvy participants).

When first run, the application will either connect to an internal GPS or search for an external Bluetooth GPS receiver. On subsequent invocations (unless the user requests otherwise), the application will establish a connection with this receiver by default at start-up.

After a connection between the handset and GPS receiver has been initiated, the user is presented with the main menu. The menu has three basic functions as shown in Figure 6. The ‘Wizard’ option allows the user to register for a particular event from a downloaded list. The ‘Location’ allows the users to see the current GPS data. The ‘Mashup’ function allows individual blog entries to be made which are displayed in list form. To make a new entry the users selects blog from the options menu which presents them with a viewfinder. Once the photo is taken the user can add a title and any tags they think are relevant. The individual blog entries can be marked and then uploaded using the options menu. Note the upload is channel agnostic and the users can define if they wish to use either WiFi or GPRS. Support for WiFi was particularly suitable for the Wray deployment given the existence of a WiFi Mesh network in the village providing extensive but not complete wireless connectivity.



Figure 6. LocoMash phone screenshots

4.2 The LocoMash Web Service

The LocoMash website acts as a community portal from which all the mashups from various events can be accessed. The website's homepage displays a list of mashups which are linked to the individual event. The events themselves are displayed using Google maps with the previously defined zones.

The sidebar on the particular event homepage then allows the visitors to the website to filter the geo-located entries by zone or zones and user or users. During the event we simply displayed the homepage for the Wray event with no filtering.

5. DISCUSSION AND FUTURE WORK

Feedback on the exploratory prototype from attendees at the Wray Scarecrow Festival was very positive. An analysis of the photo content revealed that participants did not restrict themselves to taking photos of scarecrows only and it is interesting to note that no concerns regarding privacy issues were raised. It was also

interesting to note the age range for which the presentation of the geolocated photos appealed – we expected children to be enthusiastic about the approach (which they were) but we were less expectant of the positive comments that we received from older persons observing our display. For example, one septogenarian commented “Oh yes, this is Google earth, very impressive”.

Based on our formative study of an exploratory prototype (based on a situated display, web2.0 technologies and the automatic geo-tagging of photos captured by multiple participants using mobile phones) we are confident that our approach serves as a useful intervention for supporting a community focussed user experience for events such as the Wray Scarecrow Festival and we hope to carry out further trials of the system in future similar events.

6. ACKNOWLEDGMENTS

This work is funded by the EPSRC funded CASIDE project (grant ref: EP/C005589) and a PhD studentship award from Microsoft Research Ltd. We would also like to thank Chris Conder and the continually helpful and enthusiastic residents of Wray (www.wrayvillage.co.uk) and a donation of 10 multimedia phones by Nokia Research.

7. REFERENCES

- Bamford, W. Coulton, P., and Edwards, R., (2007) Space-Time Travel Blogging using a Mobile Phone, *In Proc. of the ACM SIGCHI International Conference On Advances In Computer Entertainment Technology*, Salzburg, Austria, 13-13 June 2007.
- Brignull, H. and Rogers, Y. (2003) Enticing people to interact with large public displays in public places. *In Proceedings of the IFIP International Conference on Human-Computer Interaction (INTERACT 03)*, (Zurich, Switzerland, Sept. 1-5, 2003), IOS Press, 2003, 17-24.
- Cheverst, K., Dix, A., Fitton, D., Kray, C., Rouncefield, M., Sas, C., Salsis-Lagoudakis, G. and Sheridan, J. G. (2005) Exploring Bluetooth based mobile phone interaction with the Hermes photo display. *In Proc. of the 7th international Conference on Human Computer interaction with Mobile Devices & Services (MobileHCI 05)*, (Salzburg, Austria, Sept. 19-22, 2005), ACM Press, 2005, 47-54.
- Churchill, E., Girgensohn, A., Nelson, L. and Lee, A. (2004) Blending digital and physical spaces for ubiquitous community participation. *Commun. ACM* 47, 2 (Feb. 2004), 38-44.
- Ferscha, A. and Vogl, S. (2002) Pervasive Web access via public communication walls. *In Proc. of the First international Conference on Pervasive Computing (Pervasive 02)*, (Aug. 26-28, 2002), Springer-Verlag, 2002, 84-97.
- Greenberg, S. and Rounding, M. (2001) The Notification Collage: posting information to public and personal displays. *In Proc. of the SIGCHI Conference on Human Factors in Computing Systems (CHI 01)*, (Seattle, Washington, 2001), ACM Press, 2001, 514-521.
- Hutchinson, H., Mackay, W., Westerlund, B., Bederson, B. B., Druin, A., Plaisant, C., Beaudouin-Lafon, M., Conversy, S., Evans, H., Hansen, H., Roussel, N. and Eiderbäck, B. (2003) Technology probes: inspiring design for and with families. *In Proc. of the SIGCHI Conference on Human Factors in Computing Systems (CHI 03)*, (Ft. Lauderdale, Florida, Apr. 05-10, 2003), ACM Press, 2003, 17-24.

Izadi, S., Brignull, H., Rodden, T., Rogers, Y. and Underwood, M. (2003) Dynamo: a public interactive surface supporting the cooperative sharing and exchange of media. *In Proc. of the 16th Annual ACM Symposium on User interface Software and Technology (UIST 03)*, (Vancouver, Canada, Nov. 02-05, 2003), ACM Press, 2003, 159-168.

Romero, N., van Baren, J., Markopoulos, P., de Ruyter, B. and IJsselsteijn, W. (2003) Addressing interpersonal communication needs through ubiquitous connectivity: Home and away. *In Proc.*

of the European Symposium on Ambient Intelligence (EUSAI 03), (Eindhoven, The Netherlands, Nov. 3-4, 2003), Springer, 2003, 419-429.

Rossmann, M. (1975) Implications of community memory. *SIGCAS Comput. Soc.* 6, 4 (Dec. 1975), 7-10.

Taylor, N., Cheverst, K., Fitton, D., Race, N. J. P., Rouncefield, M., and Graham, C. (2007). Probing communities: Study of a village photo display. *In Proc. of OZCHI '07* (Adelaide, Australia, November 28 - 30, 2007). ACM Press, New York, NY, 17-24.