Preprint: Final version appears as: STELMASZEWSKA, H., FIELDS, B. & BLANDFORD, A. (2006) Camera Phone Use in Social Context. In *Proc. HCI 2006 (Vol. 2)*

Camera phone use in social context

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Abstract. The primary contribution of this paper is in identifying social uses and practices of camera phone images in co-present settings. Three distinct practices were observed: 'sharing a moment now', 'sharing a moment later', and using photos to initiate social interaction with strangers. We propose that interactive problems with existing systems might be a starting point to generate user requirements for technology supporting social practices in co-present settings.

Keywords: user experience, HCI, mobile phone technology, camera phone, social interaction, social context, user requirements

1. INTRODUCTION

Personal photography has been a part of the lives of many people for a long time. Photos not only present a documentary of someone's life, but are also of great sentimental value. People use photography to capture feelings, events and personal experiences, and to communicate with others. The latest innovations not only support interactions of people with technology, but also facilitate new forms of interaction with others. Mobile phones and camera phones in particular are examples of such technology. In recent years their primary function has changed from being a medium of verbal or text communication to one that uses pictures to facilitate people's social life. Mobile phones with integrated camera and video features have changed the way people communicate, interact and shape their social activities [1, 2, 3, 4, 5, 6]. With the rapid growth in the camera phone market and continued improvements in technical performance, picture quality, and so on, camera phones might supplant the use of digital cameras, in many everyday settings.
Although there has been some research focussing on the use of camera phones [2,3,5,6], there have been no direct investigations of how camera phones are used to mediate social interaction between co-located users. In this paper, we describe such a study of the collaborative use of camera phones by co-located users.

1.1 Related work

In recent years, there has been substantial interest in digital photography, with a particular focus on how the digital medium facilitates sharing of images [7,8,9]. Studies of sharing digital photographs include web-based systems, mobile applications and multimedia messaging. Most of the studies focus on personal applications for sharing images in a remote location [1,2,9] but work on sharing images in co-present settings is in its infancy.

Kindberg et al. [2] investigated what people capture on mobile phones and what they do with these images. They presented a six-part taxonomy that describes the intentions behind the camera phone images. These encompass affective intentions enriching a mutual experience, communication with absent friends or family and personal reflection or reminiscing; and functional intentions supporting different tasks: mutual, remote and personal.

A field study conducted by Kato [1] explored how use of mobile phones and camera phones changes people's daily activities in Japan. He argues that the new ways of pervasive photo taking enabled by camera phones allows people to document their lives on a daily basis, which can be preserved and shared as a life of local community.
The work of Okabe [5] focused on practices of Japanese camera phone users, which include personal archiving, intimate sharing, peer-to-peer news and sharing. He argues that capturing and sharing visual information cannot be divorced from the social relations and contexts. This is in line with Scifo's [6] research, which shows that taking photographs on camera phones and using MMS communication allow younger users to establish their identity within social groups and can intensify communication within that community.

The relevance of social relations and uses of photographs were also identified by Van House et al. [9]. They discovered five different sets of social uses of personal photos: creating and maintaining social relationships, constructing personal and group memory, self-expression, self-presentation, and functional communication with self and others.

Photos could also be used for social interaction. A mobile picture system (MobShare) developed by Sarvas et al. [10] supports that by transferring photos from the phone to different devices allowing people to share and discuss photos. These include transfers (1) to another phone over the network (e.g. MMS), (2) to a PC, (3) to a network server over the network, and (4) to a printer using a cable connection or Bluetooth.

This study is specifically concerned with people's experiences when using camera phones for social interaction in a co-present setting. The paper draws from an earlier more general study into people's experience and emotions using personal technologies such as PDAs, digital cameras and mobile phones [11].

2. DESCRIPTION OF THE STUDY

Many methods have been used to study people's uses of mobile phones. For instance diaries, interviews and field studies [1,2,3,5,10]. Because we wanted to obtain insights into the ways people use their camera phones as a medium for social interaction, we adopted Kindberg at al.'s methods [2] of asking participants about circumstances and reasons for taking these images and their life cycle. In addition, we conducted a set of field observations to develop a better understanding of people's practices using camera phones.

A group of seven students including undergraduates, PhD students and college students, aged 18–27, was interviewed. The interviews lasted between 25 and 45 minutes and were recorded and later transcribed. Each of the subjects had at least a year's experience of using a camera phone. The participants were asked to describe how and for what reasons they use their camera phones. They were also asked to show a few of the images (pictures or video) stored on their phones and explain the setting in which each image was produced and shared with others. Participants were encouraged to describe the circumstances in which pictures were taken, who took them, whether were they taken by the participants themselves or received from another person, and the reason for taking these pictures. Furthermore, the interviews also enquired into the storage, and transmission of images: how, why, and to whom images were sent.

The data from the field observational studies were gathered from a variety of different public spaces including: pubs, restaurants, leisure and entertainment places, museums, and public transport (tube and buses). There were ten individual instances captured, monitored and recorded in field notes. Data from both studies (interviews and field observational studies) was transcribed and then analysed by firstly, coding the data by using qualitative methods to identify emerging themes; and secondly the themes were merged to extract the high level of concepts that gave the outline of the use and practices of camera phones.

3. FINDINGS

The field observation study revealed many instances of people being engaged in social interaction using camera phones in co-present settings. The in-depth interviews provided extended information to support these phenomena and the following sections will discuss them in detail.

3.1 Social uses of camera phones

Consistent with other studies [2,3] we found that people take photos for individual purposes, which are evocative of special events, trips, holidays, or beautiful landscapes. A general practice is to share them with friends and family, which establish their social interaction [11]. Sharing digital photos is often done remotely via email or by posting them on the web [11,12]. However, we observed three specific practices that occur between participants who are co-located. These are 'sharing a moment now', 'sharing a moment later' and using photos to initiate social interaction with strangers.

3.1.1 'Sharing a moment now'

This study demonstrates that one of the practices of using camera phone was to take a 'spur of the moment' photo or video and share it with people in co-present settings (i.e. present at the scene). People reported having fun when taking photos or videos of their friends' behaviour, and then viewing them collectively in-situ. This kind of behaviour seems to motivate and shape social interaction as one of the participants (A) reported:

> ' … she was happy and funny (referring to a friend) … far too engaged with dancing to notice what was happening around her … and I just thought that I'll just take that picture. … there were few of us friends so then I showed them and then other friends were taking more pictures of her dancing and we were waiting for her to realise what was going on … we were all taking pictures of her … we shared all the pictures and picked up the funniest ones. It was so funny because she couldn't believe that we did that and she didn't even notice it.'

Data shows that photos were used for functional purposes as well, which is consistent with [2,9]. It was observed that people took a picture of a map displayed by the leader and then viewed it on their camera phones. This allowed every person within the group to see the map clearly and use it for further reference.

Another common practice was to transfer photos across phones using the Bluetooth technology so everybody concerned could store and use them when needed. However, it appeared that some people found it difficult to use it and either abandoned the transfer or asked friends for help.

3.1.2 'Sharing a moment later'

A social interaction at co-present settings was reported to be associated with participants' experience when viewing pictures/videos stored on individuals' phones but taken previously. The intention behind such activity was to share memories of special events, report on events to those who were absent at the time of events, create or share a documentary of a friendship or family life. People were more inclined to use photos for storytelling, which is in line with [2,8]. However, since phone screens are very small (remarked upon by participants) it was common to use other media like computer or TV to display photos in order to improve visibility of pictures and enhance the experience of their viewers.

> 'I transferred them onto my computer … I'm quite organised with my pictures so I categorise them and put them in kind of albums and sometimes when I'm with friends we like to go through pictures and have fun.'

was reported by the participant A whereas participant M commented:

> '…sometimes what we do is we Bluetooth to transfer our pictures to one of our computers and then have a slide show so everybody can see it. …you see the phone screens are very small and if we all want to have fun we need to see those pictures simultaneously. With camera phones we can't see it clearly if there are more then two or three people looking. It's just not enough space …'

Sharing photos at co-present settings proved to be a way of social interaction that brings fun and joy to people's lives. An extract from an interview confirms this point:

> 'I'll show them (referring to family) what I managed to capture and then we have a good laugh.'

or another comment from the participant A:

> '… you take pictures and when you view them you can laugh and have fun'.

3.1.3 Social interaction with strangers

As reported in our previous study [11] social interaction can take different forms from text, graphics, to interactive games. All of them occur between friends or members of family sharing the same technology (i.e. computer, digital camera or mobile/camera phone). The most striking findings were the camera phones being used as a new medium for initiating social interaction with strangers. It was conveyed that people take photos of others (who they like) to show their interest, introduce themselves, or simply start a new social relationship.

The comments from one of the participants' (E) support this claim:

> 'I was at the Harvester, a restaurant/pub thing, …and there was a small window with glass between it looking like a fake door and the guys were looking through that doing (mimicking facial expressions) and then I saw one holding his camera phone against one of the window things and there was a picture of me going (shows facial expression) and I didn't know that they were taking it … I didn't really mind. It's a good humour… it was kind of friendly, sort of vague flirting without talking … just taking pictures.'

or another remark by participant M:

> 'We were in the bar … having fun and there was this guy dancing [laughing] kind of a very funny dance … almost like an American Indian kind of dance … and one of the girls from our group took a photo of him because she liked him and she was showing it to us so instead of looking at him we could see his picture … and when he saw her taking pictures of him he did the same to her… the whole situation was funny … at least we had fun watching them two taking pictures of each other instead of talking …'

This kind of behaviour typically occurred in public spaces such as pubs, bars, or clubs where people usually gather for social events and interaction with others is a part of entertainment. In our study, the social interaction took place through digital photos. Though, this was not always appreciated by those involved. Some participants felt uncomfortable and annoyed with those taking photos without permission or agreement, as participant L noted:

> 'I don't know if I would be offended so much. I think it depends what for … sometimes you get photographers going like around pubs and clubs … and I never said yes to the photo. The other night when I was there with my friend and this group of guys we met before errr … this guy said: 'Oh yeah, lets get a picture' but we went like:' no, we really don't want to'. And they had one done anyway and this kind of annoyed me a bit because … it's fair they wanted the picture of us but we didn't really want to be in it. … I think it depends how much choice you are given as whether or not you want a photo taken'.

It seems that communication does not only take place via technology but also alongside it, which is consistent with Stelmaszewska's et al. findings [11]. Moreover, Van House et al. [9] argue that technology (e.g. online photo blogs) is used to create new social relationships. Although this study is at its primary stage and further evidence is required, we suggest that camera phones provide new channels of social interaction within co-present settings.

3.2 Interactional problems

In general, the data illustrates that although camera phones are becoming a part of our social lives there are interactional problems that hinder people's experience. When using camera phones for 'sharing a moment now' activities sending photos from phone to phone is a common practice. However, several participants encountered difficulties when using MMS feature. In addition, using Bluetooth facilities involved a lot of settings and it was not easy to find the function on a phone.

Another important issue revolves around the lack of compatibility between camera phones. People do not send pictures to their friends because they will not be able to view them was commented by the participant E:

'… none of my friends are really doing this … you have to have the same phone or something to be able to send it and for them not to just say: 'message not being able to deliver' or whatever. Some people tried to send pictures on my phone but I never got them.'

Another highly valued property for the majority of participants was the quality of pictures. They claimed that with better quality pictures they could print and exhibit them in their living environment instead of storing photos on their phones or transferring them on a computer, or the Internet.

A quick access to photo image features was a further crucial issue pointed out by participants; one remarked:

'… one of my friends helped me to set it up so I can us it by pressing just a couple of buttons instead of going through menus and stuff. It was horrible. I missed so many great pictures because of that and I was very upset about it. … it's very important. I could have so many great pictures but couldn't find the camera function on my phone … it was very frustrating.'

Finding archived photos that is a predominant activity in the context of 'sharing a moment later' appeared to be another concern. As observed during the field studies, people do not want to spend too much time looking for pictures when engage in social interaction. This caused frustration and dissatisfaction as said by participant J:

'Where is it?!!! S… Hrrrrrrrrrr.'

So providing functionality that is transparent to users might reduce the number of interactional problems, which is of paramount importance when designing systems. It might also enhance the use of camera phones creating pleasurable experience. This could be a part of user requirements that clearly indicates what is required from camera phones design to satisfy not only functional purposes but also generate experience that would evoke pleasure, joy and fun mentioned by participants as an essence of social interaction.

4. DISCUSSION AND CONCLUSIONS

This paper has described distinctive practices of camera phones users occurring in co-present settings. We have argued that camera phones enable new ways of social interaction through taking and sharing photo imaging and these activities are inseparable from social relations and context, which is consistent with Okabe's [5] and Scifo's [6] work. However, system designs for camera photos need to overcome challenges of photo transfers, quality of photos, and quick and easy access to required functions, to name just a few.

More generally, when designing camera phones that are used for social interaction it is crucial to develop an understanding of emerging uses, practices and social activities that are supported by camera phones. Moreover, identifying interactional problems within existing systems might be a good staring point for discussing user requirements allowing designers to develop systems that would fulfil utilitarian as well as user experience needs.

REFERENCES.

[1] Kato, F. (2005, April 28-30). *Seeing the "Seeing" of Others: Conducting a Field Study with Mobile Phones/Mobile Cameras.* Paper presented at the T-mobile conference, Budapest, Hungary.

[2] Kindberg, T., Spasojevic, M., Fleck, R., & Sellen, A. (2005). An in-depth study of camera phone use. *Pervasive Computing, Vol. 4* (No. 2), pp. 42-50.

[3] Kindberg, T., Spasojevic, M., Fleck, R., & Sellen, A. (2005, 2-7 April). *I Saw This and Thought of You: Some Social Uses of Camera Phones.* Paper presented at the CHI'05, Portland, Oregon, USA.

[4] Ito, M., Okabe, D. (2005). Technosocial Situations: Emergent Structurings of Mobile Email Use. In Ito, M., Okabe, D. & Matsuda, M. (Ed.), *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life.*

[5] Okabe, D. (2004). *Emergent Social Practices, Situations and Relations through everyday Camera Phone Use.* Paper presented at the International Conference on Mobile Communication, Seoul, Korea.

[6] Scifo, B. (2004). *The Domestication of Camera-Phone and MMS Communication: The Early Experience of Young Italians.* Paper presented at the T-Mobile Conference, Hungary.

[7] Frohlich, D., Kuchinsky, A., Pering, C., Don, A., & Ariss, S. (2002, 16-20 November). *Requirements for Photoware.* Paper presented at the CSCW'02, New Orleans, Louisiana, USA.

[8] Balanovic, M., Chu, L., & Wolff, G. J. (2000). *Storytelling with digital photographs.* Paper presented at the SIGCHI 2000.

[9] Van House, N., Davis, M., Ames, M., Finn, M., & Viswanathan, V. (2005, 2-7 April). *The Uses of Personal Networked Digital Imaging: An Empirical Study of Cameraphone Photos and Sharing.* Paper presented at the CHI'05, Portland, Oregon, USA.

[10] Sarvas, R., Oulasvirta, A., & Jacucci, G. (2005, 18-22 September). *Building Social Discourse Around Mobile Photos - A Systematic Perspective.* Paper presented at the MobileHCI'05, Salzburg, Austria.

[11] Stelmaszewska H., Fields. B., & Blandford, A. (2005). *Emotion and technology: an empirical study.* Paper presented at the Emotions in HCI design - Workshop at HCI'05. Edinburgh

[12] Counts, S., & Fellheimer, E. (2004, 24-29 April). *Supporting social presence through lightweight photo sharing on and off the desctop.* Paper presented at the CHI, Vienna, Austria.