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Editorial
Collocated Social Practices Surrounding Photos

Without doubt, digital photographs have become the primary visual medium we use to capture, save and recollect our experiences. Consequently, the ways we interact with digital photos, archive them and share them have become cornerstone subjects in Human-Computer Interaction (HCI). In particular, a growing body of research in HCI has amassed around what can best be described as the collocated social practices surrounding photos[1]. For instance, several studies have elaborated on the established ways in which people share (e.g., Frohlich et al., 2002; Crabtree et al., 2004; Van House et al., 2005), organise (Rodden and Wood, 2003; Kirk et al., 2006) and display (Drazin and Frohlich, 2007; Swan and Taylor, 2008; Durrant et al., 2009) photos, as well as drawing attention to associated activities such as computer-mediated photo sharing (Voida and Mynatt, 2005; Kindberg et al., 2005). Relatedly, empirical research has spawned numerous efforts to explore how technology influences collocated photo sharing (Lindley and Monk, 2008) and design systems that support this activity, some augmenting conventional practices (Kim and Zimmerman, 2006), and some offering innovative (Balabanoviç et al., 2000; Frohlich, 2004; Graves Peterson, 2007) and in some cases provocative solutions (Martin and Gaver, 2000; Durrant et al., 2008).

In this Special Issue on the collocated social practices surrounding photos, our aim has been to assemble a range of examples to provide a sense of how far the work in the area has progressed and provide an indication of the directions those of us in HCI are heading. In a manner of speaking, we hope for the issue to serve as a snapshot of where we, as a field, have got to in our ongoing empirical studies and the kinds of contributions being made towards interactive system design. The articles included in the issue thus range from studies of established and emerging sharing practices (Durrant et al.; Van House), to the deployments of novel photo capture and sharing solutions (Fleck and Fitzpatrick; Nunes et al.; Patel et al.; Taylor et al.), and trials of innovative interaction techniques (Kray et al.).

Rather than merely listing off the studies and projects that follow, however, we wish to introduce the Special Issue by discussing three broad themes: reflection and remembrance; performativity and expression; and connection and communication. These themes came to us in reading the assembled articles, but also offer an indication of the areas we have been pursuing in our own studies of digital photography and, more generally, our ongoing research into everyday life. What we hope they offer is an impression of not just the mechanics of how photos are shared, but also, and perhaps more importantly, *why* it is people share them and the importance sharing practices hold. In this vein, our thoughts are by no means meant as comprehensive in

[1] It is worth noting that there is a significant body of work investigating photography and photo sharing that pre-dates HCI's interest in the theme (e.g., Sontag, 1977, Chalfen, 1987, 1998; Spence & Holland, 1991). As evidenced in this introduction and the articles to follow, this corpus has shaped HCI's continuing research and design programmes.

their coverage nor, in and of themselves, complete. Instead, we use them as loci for reflecting on where we have come from and considering the new opportunities that may lie ahead.

Reflection and Remembrance

Photography has long been associated with the idea of providing new perspectives. The street photographer Garry Winogrand is famously quoted as saying *"I photograph to find out what something will look like photographed*", and theorists such as Sontag (1977) and Berger (1980) have argued that by fixing a scene, photography provides the opportunity to study and see it anew. Sontag in particular suggests that the photo has the potential to make visible additional details, with the consequence that the familiar is made to appear strange. This defamiliarisation might be understood as providing an opportunity for reflection; indeed, researchers in HCI have noted the ways in which apparent strangeness and ambiguity can lead one to reflect upon the everyday (e.g., Bell et al., 2005; Ståhl et al., 2008; Harper et al., 2008). While such ideas tend to be associated with looking backwards, for example in retrospectively sorting through photos, it is also evident that the act of photographing a subject has the potential to foster reflection. The taking of an image can encourage the photographer to look at a scene differently, through the composition of the shot and the choices made in deciding what to photograph. Here we will explore notions of reflection and remembrance both at the point of capture and afterwards, consider how they might be influenced by advances in technology, and ponder on what the implications of these might be for future designs.

Reflection at the Point of Capture

Photography, particularly professional photography, is linked to the idea of the 'decisive moment' as a means of revealing a scene as compelling or evocative. In domestic photography too, especially where photographic film is used, decisions of what to photograph are coloured by the fact that processing and developing prints is costly, with the result that people take fewer images, saving them for special occasions. Related to this, Sontag (1977) has suggested that the taking of a photo serves to honour the event in question, imparting it with a sense of significance. More recently, following the shift to digital, it has been argued that considerations of what is 'photoworthy' are being redefined (Van House et al., 2005; Sarvas et al., 2005). Photographers take many more snapshots than they did previously, and these snapshots differ in that they often feature subjects of lower import, and may be deleted immediately or stored but never viewed (Ito et al., 2006). Kindberg et al. (2005) note that the ubiquity of the camera-phone has resulted in the taking of photos to support ongoing tasks, and Van House et al. (2005) also remark upon the use of photos to support memory, not of momentous occasions, but of useful but mundane subject matter (the label of a good bottle of wine being a typical example). It seems then, that in domestic photography at least, the choices that were previously associated with image capture, and the reflective processes associated with this, are being superseded by the possibility to record almost everything.

We see in this Special Issue also how the ubiquity of the camera is leading people to adopt different collocated social practices relating to the capture of images. New roles are emerging in which people are beginning to reject the need to take photos at shared events, choosing instead to depend upon others to undertake the task. As reported by Durrant et al. (this issue), this is an established practice within families, where it is

typical for certain members to take on roles relating to the taking of photos and curatorship of them. However, it is becoming evident that this practice now commonly extends beyond the bounds of family (Van House, this issue). People are increasingly relying on their friends to take photos for them, on the understanding that the images will be uploaded to a shared resource through the internet. Interestingly then, while it might be expected that advances in digital camera technology would make it easier for everyone to take the images they want to at events of significance (technological developments mean it is no longer necessary to be a skilled photographer to take a reasonable image, and the cheapness of capture means that many takes are possible), it seems that instead (i) people feel less compelled to take photos at important events where others can be relied upon, and (ii) people capture an increasing amount of images of banal subject matter.

Issues of Authorship versus Ownership

These alterations have implications for the ways in which events are experienced and reflected upon, both as they unfold and afterwards. Outwardly, the carrying of a camera and taking of photos has the potential to change how individuals interact with others at social events and what they actually look for; clearly, the behaviours associated with searching for and composing images are not needed if the act of taking a photo is not engaged in. Perhaps more surprisingly, it seems that when reminiscing around photos, people make little distinction between those taken by themselves and those captured by others (Van House, this issue). This points to a considerable shift in the way that photo sharing is currently understood; in Frohlich's (2004) diamond framework for domestic photography, for example, the photographer serves as a key component. However, while it is obvious that if taken by someone else, photos may not accurately reflect the interests of those sharing them, it is also true to say that many domestic snapshots follow the same format, and can serve as a key to remembering regardless of who took them. Indeed, it is important to note that while photos are sometimes perceived as a means of off-loading memory, they cannot be considered a direct record of what actually occurred. They are rarely candid and, as already noted, tend to honour certain moments. We will say more on the topic of performativity below, but suffice to say here that the moment of capture is bound up with the act of creating that moment and as such, it is crafted and posed. Further, photos are generally understood and interpreted in this way; for example, Durrant et al. (this issue) report instances of photos which depict events that cannot be directly recalled (such as family gatherings), but which nevertheless serve as a representation for similar, remembered, occasions.

The borrowing and merging of collections of photos also has further social implications. Digital images are easily copied, shared and downloaded, being incorporated into the collections of others without any obvious demarcation. We see in this Special Issue how even in families, issues of ownership and authorship can arise where this occurs (Durrant et al., this issue). In the context of other groups, such as those bound by friendship, it will be interesting to see whether new roles such as 'group photographer' evolve, what the implications are for notions of obligation, reciprocity and authorship, and how these are managed in an online context. Moreover, it will be interesting to follow the ongoing development and adoption of photographic technologies to cater for these emerging social practices. Previous researchers have suggested that photo sharing sites such as Flickr are most suited to image sharing with strangers (Miller and Edwards, 2007), and online photo albums

tend to cater for individual accounts rather than those set up for groups. It seems though, that individuals are increasingly making their photos available to others and merging their collections with them. The membership of these online groups needs to be flexible, shifting according to the occasion and who was present at the time. While attempts to manage this can be achieved through tagging (Ames and Naaman, 2007), such approaches are difficult to reconcile with the idea of having an online collection for an exclusive group. Technologies that take into account proximity, such as Bluetooth, might come into play here, as could new technologies such as MobiPhos, described in this issue by Patel et al., which supports the collocated capture of images which are then shared amongst the photographers.

Emerging Technologies, Reflection and Remembrance
Other technological developments point to different approaches to the nature of photography itself. For example, wearable lifelogging devices such as SenseCam (Hodges et al., 2006), that take photos automatically, remove any notion of the decisive moment or the honouring of an occasion; with such technology the primary aim is to counter oblivescence. However, the use of SenseCam by families and couples has shown householders to be fairly selective in the images they capture and what they bookmark when organising them (Lindley, Harper et al., in press). Additionally, the narratives that are constructed around SenseCam images reflect social norms of what is typically considered 'memorable', with the focus being on content deemed to be of interest to others (Lindley, Randall et al., in press). It seems then that these householders did not wish to precisely 'log' their lives, but instead used SenseCam with the aim of creating an appealing photographic record that could be made relevant to an audience, in much the same way as images captured with a manual camera might be utilised.

Further studies of SenseCam have explored alternative uses of the wearable device. Returning to ideas of defamiliarisation and ambiguity, Harper et al. (2008) and Fleck and Fitzpatrick (this issue) have explored the ways that the visual and temporal qualities of SenseCam photos might serve as an aid to reflection. The defamiliarisation associated with traditional photography is said to be exaggerated further through SenseCam, due to the combined effects of its fisheye lens, the capture of images from an atypical vantage point, and a representation of time that is felt to be discontinuous from that remembered (Harper et al. have reported SenseCam users to be surprised at the amount of time they spend doing mundane activities such as driving, for example). These studies illustrate how the potential for reflection that photos offer can be pushed further through new forms of technology. Thus, while the use of SenseCam images as an artefact for remembering is found to emulate familiar social practices surrounding photos, possibilities for reflection are found to be altered somewhat. Taken together, these studies emphasise the importance of considering the socio-technical when exploring new forms of photography; the same device may largely reflect existing social practices in one context, while allowing for new possibilities in another.

Performativity and Expression

We now turn to consider the function of photography as a resource for self-expression and, in particular, the significance of performance in people's collocated interaction

with photos. We also reflect on the ways in which digital technology mediates performance and expression in the course of interaction.

Photography for Social Selves

Through a socio-cultural lens, the concept of selfhood is defined by our relationships with others (Bruner, 1990). Within these relationships, self-expression involves the performance or presentation of oneself to others, and, in our efforts to do this, we draw upon objects in the world around us, such as photos. Arguably, self-expression has always been at the heart of photographic practice and, in turn, photography has been used, time and again, as a vehicle for exploring the nature of selfhood. Indeed, numerous accounts of photography highlight its role in the embedding and reproduction of social norms and expectations. Many have argued that the presentation of photos to others is a means to actively construct social phenomena (e.g. Chalfen, 1987; Slater, 1995; Hirsch, 1997).

The performative element of photo sharing is important to take into account when thinking about the possibilities for collocated interaction that are offered by digital technologies. For example, digital tools afford novel contexts for presenting and sharing photos, with implications for the configuration of 'presenter' and 'audience'. A number of the articles in this Special Issue raise interesting discussion points around this relationship. We will touch on some of these in the reflections that follow. First, we shall discuss the notion of photo sharing as a dynamic performance of self and relate this to a collocated context of interaction. Second, we reflect on the numerous platforms for presenting photos that are now available, and the implications of this diversity for collocated photo sharing.

Photo Sharing as a Dynamic Performance of Self

The sharing of photos can be viewed as a contingent and improvised interaction between the presenter and her audience. As we have discussed above, people's relationships to photos may change from situation to situation and across time. It is this contingency that Van House emphasises in her article for this issue. She articulates a 'performative account' of contemporary trends in digital photography, drawing from two theories of performance, one that focuses on the enactment of self through photography, and another focussing on self-presentation and impression management. Using these theories and building on a recent set of studies, she suggests that dynamic, face-to-face photo sharing remains of central importance to people in the course of their increasingly computer-mediated lives, because it enables the greatest flexibility in dialogue between presenter and audience.

Taking this perspective, we are reminded that people don't always want to 'fix' the meanings and stories that they attach to photos. The notion of self-presentation as dynamic and changing presents a challenge to designers when considering systems for automating tagging and annotating. Captions, annotations, digital storybooks and so on, go some way to elaborating what a photo is 'doing' in expressive terms. But they may not afford the true dynamism that happens face-to-face and *in situ*.

The new capability to view a photo immediately after capture also makes for new kinds of collocated interaction and new configurations of the presenter-audience relationship. Patel et al. explore this capability in their article (also in this issue). Documenting studies of capture and share activities during a sight-seeing trip, they

describe new collocated forms of expression that are made possible through the emergence of 'mobile' and 'synchronous' sharing practices on networked mobile devices. In general, the capability to view photos upon capture seems to be a significant feature of the contemporary photographic practice, with implications for self-presentation. As Van House (this issue) points out, collocated sharing on cameras and camera-phones is found to be popular. Being able to share photos on cameras and other portable devices, including laptops, creates new ways of engaging with one's environs.

The coupling of capture and display functionality has implications for editing and exhibiting, parts of photographic practice that have traditionally been distinguished from one another (Chalfen, 1987). We suggest that this may impact upon the dialogue between the photographer-presenter and the subject-as-audience. The subject-as-audience might more actively participate in how they are represented by others, while the photographer-presenter might gain greater insight into how the subject-as-audience wants to be represented. Having mobile devices at hand also creates the opportunity for accessing photos on-the-fly, whether published online or carried locally on the device itself. The networkability and portability of devices broadens the contexts in which people can draw upon photos to express themselves, along with the audiences that people may present to (Sarvas et al., 2005). This opens up an interesting discussion about the role of 'place' in photographic presentation.

Platforms for Presentation

Sharing photos in the company of others has traditionally taken place around paper albums, slide shows, stacks of printed photos, or framed displays. Each of these modes of sharing establishes a different dynamic between presenter and audience, but, in all cases, the presenter and the audience are clearly defined. This is partially due to the fact that everyone involved is collocated.

Online photo sharing applications on social networking sites, such as Flickr, Facebook and MySpace, introduce new platforms for sharing that complement these traditional methods (Miller and Edwards, 2007). However, with the option to share photos with potentially millions of people in online communities, the roles of presenter and audience may be less clearly defined. Tagging systems allow for collections to be created by multiple authors and, using online applications, people now easily express themselves using other people's photos as well as their own (Ames and Naaman, 2007).

Certainly, photo sharing in the digital domain presents complex challenges for establishing the presenter-audience relationship in relation to place. Concerns for coordinating 'who' is viewing 'what' of photo collections has recently been explored by harnessing location-based metadata associated with photos' capture (Ahern et al., 2007). Also, online applications and the ubiquity of Internet access present new opportunities for combining collocated viewing with remote, synchronous viewing. Some members of a group could be sharing photos together in one location, huddled round a laptop. At the same time, part of the audience for the same presentation could be distributed across a number of different places.

The physicality and situatedness of photos can be important for the meaning that is created around them. For example, the forms and arrangements of photo displays on

walls and in cupboards can be central to what they communicate. Topographical and curatorial arrangements of photos in the home's 'ecology of artifacts' (Crabtree and Rodden, 2004) are explored in this issue: in relation to new technologies for augmenting physical memorabilia with digital links to photos (Nunes et al., this issue); by leveraging the traditional ritual of sharing stacks of paper photos around a table (Kray et al., this issue) and as an expression of family relationships and domestic order (Durrant et al., this issue).

Connection and Communication

The third and final theme we wish to consider revolves around the nature of communing or coming together and the ways in which developing photo practices and technologies might affect or otherwise influence this process. In a Special Issue concerned with, what we have termed, collocated social practices surrounding photos, this inter-relationship between the sharing of photos and the sense of what it means to 'come together' seems a particularly relevant issue to explore.

Photos have for many generations been thought about as something around which social practices are organised. Chalfen's (1987) introduction of the notion of home-mode photography essentially highlighted the distinction between photography as reportage and photography within the home as a socially engaged practice used to cement family values and roles. For a long time the act of collaboratively consuming photos necessitated a co-present interaction, people simply had to be together to share and interact around their photos. The digital revolution however began to question this assumption, bringing with it easier means by which to share photos remotely; many of the physical affordances of the print photo and the subtleties of collocated practices of sharing were lost in the transition to the digital medium. Consequently, much work has been done to explicate those social practices of photo sharing with a view to informing the design of "photoware" (Frohlich et al., 2002, Crabtree et al., 2004) in an attempt to recreate what might have been lost.

As photoware develops and becomes informed by a deeper understanding of social practices (as articulated through the papers in this present issue) we see two (broadly framed) social settings, wherein there will be unique developments in technologies designed to foster and support a sense of community or 'coming-together-ness'. These areas, namely, the domestic-private and the community-public, offer what Barker (1968) might refer to as instances of behavioural-milieu synomorphy. We believe that these behaviour settings (Schoggen, 1989) offer intriguing and specific affordances for technology design that resonate with specific human values. Whereas significant previous research might have focused more specifically on the articulation work surrounding photos (Crabtree et al., 2004) and the interaction design possibilities it foregrounds, we wish to briefly explore these two different interactional settings, examining the values and possibilities they afford for photo practices, highlighting work that is already happening in these spaces and suggesting avenues for further exploration. These two locations, the domestic-private and the community-public, are considered each in turn below.

Photos in the Home and Digital Hearth

The first of our behaviour settings to consider is the domestic space, given to be private in our distinction but ostensibly not always so[2]. Within this space the storage, collection and display of sentimental items has been demonstrated as significant to people (Petrelli et al., 2008, Kirk et al., in press), with photos evidently making up a large part of these collections of sentimental items (Swan and Taylor, 2008). As we have discussed above, the stratigraphy or placing of photos within the home has come under a certain amount of scrutiny and has been highlighted as an activity which is particularly demonstrative of the social relations at play within the domestic space (Durrant et al., this issue). Needless to say therefore the use of and interaction with photos in the home has become a matter of common practice and whilst digital photos have evidently begun to pervade the home, in many respects, the unique properties and requirements of the digital media are adding a layer of practice rather than distracting from existing practices.

How we orient our social practices to such digital photos within the home is however largely an area as yet to be determined. As new technologies are developed for the home-based sharing of photos, new practices will emerge and become 'made-at-home' (for an example of such socio-technical endeavours of making technology 'at-home' see Tolmie et al., 2007). Intriguingly, one class of technology that is much vaunted as *the* technology for collaboration around photos is the emerging class of touch-interactive tabletop computing devices. Over a number of years such technologies have been being developed and the canonical interface software that they present is photo-manipulation and browsing based. Whilst such systems are not readily available to home users (being largely toys of the research community) the development of commercial systems by vendors such as Microsoft (with their Microsoft Surface™ platform) make the domestic deployment of such technologies an increasingly likely outcome. As stated, much of the research concerning table computing has focused on photo sharing as an application (Shen et al., 2003; Apted et al., 2006) and in particular the incorporation of multi-touch technologies into table computing has promoted notions of collaborative interaction (Wilson et al., 2008).
In a fortuitous parallel development there has been increasing discussion of the notion of the digital hearth (Flynn, 2003). This notion builds on an understanding of homes having a focal point around which family life is centred. This focal point has purportedly shifted and become technologised over time, moving from the literal hearth to the radio and then the TV, and then more recently (and arguably) the digital games console (ibid).

"Cultural histories of the living room are articulated through the changing place of the domestic living-room hearth. Etymologically, hearth is derived from the Latin for focus, and, over time, the focus of the gaze has shifted from the fireplace to radio, to television and now to games console" (Flynn, 2003, p. 560-1).

The recent discussions of the digital hearth being centred around gaming technologies have highlighted an apparent incongruence between such technologies and the supposed value of a hearth in the home (Voida et al., 2009). Flynn (2003) talks of

[2] There are varieties of public activity that take place within the home but for practical purposes we can assume that much of the activity that takes place in the home is of a private and family-oriented nature and it is to this aspect of domestic life that we attend herein.

"narratives of identity associated with domesticity and family togetherness" (p. 565) as being integral to the concept of hearth, raising the issues of potential tension that might be caused by gaming technologies being antagonistic to this concept. Whilst work such as that by Voida et al. (2009) does a very good job of reconceptualising the role of gaming in the home to make sure these potential complaints are suitably put away, it is evident that such concepts of narratives of identity and family togetherness are exactly the kinds of social interplay promoted by photo-talk (Chalfen, 1987; Frohlich, 2002). As such the technologies of photo sharing such as collaborative interactive surfaces could reasonably be positioned as devices fitting this concept of the digital hearth. Conceptualised as focal points and centres around which shared family activities take place, table technologies may well find their niche.

Resonating with these issues, one recent study of an interactive table system, referred to as the 'Family Archive' (Kirk et al., in press), highlighted the ways in which such collaborative computing systems can be used to re-engage users with their photo collections and can become a hub within the home for collaborative interaction around digital materials. Future versions of this Family Archive system will purportedly seek to posit such surface-like computing infrastructures within a networked home environment, such that digital materials archived and created on the shared device can be woven into the material fabric of the home (assuming a proliferation of heterogeneous display devices in the typical home).

We expect to see increasing numbers of research studies appearing that take the approach of Kirk et al. in developing table computing devices for the home and specifically deploying them in these contexts for *in situ* evaluation. Whilst studies in this Special Issue, such as that by Kray et al., go some way towards realising technical advances for table-like interactions surrounding photos, detailed understanding of the complexities of a notion such as digital hearth and associated social practices are yet to appear. Using such a concept as a tool for framing the study of familial values in shared technology use will have increasing relevance for both interactive surface technologies and photoware. As such, it is the engagement with critical issues such as intergenerational interaction, shared ownership, access control and negotiation, public-private representations of content and the design of both synchronous and asynchronous collaborative interfaces (given that a shared device in the family home does not always mean co-present sharing) that will drive research in the domestic-private behaviour setting for the next few years.

Community Building through Digital Photos

The second behaviour setting we wished to consider or raise as a potential area for significant growth in studies of photoware is the community-public setting. Research concerning interactive public displays is becoming increasingly commonplace, with systems such as Dynamo (Brignull et al., 2004) and CityWall (Peltonen et al., 2008) highlighting specific attempts to explore massively collaborative interfaces for media sharing in public venues. In our own Special Issue there is a leading piece of work by Taylor et al., which has sought to explore how these kinds of public access display spaces can be developed for communities and which explores a little the issues involved in the community appropriation of such a device.

We believe that such public display devices will become increasingly pervasive. This is perhaps in no little part because of the rise in use of mobile technologies and the

convergence of functionality in mobile devices such that these tools of everyday life are now replete with media capture and sharing technology. Barriers to access to public digital displays will therefore be extremely low given that most people will find that they already own the technology for interacting with such technological infrastructure. Even in communities based in 'global south' economies, mobile technologies have become the *de facto* computing experience for most users, given their inherent affordability (Marsden, 2003). As such the opportunity for digital exchange and display is almost too rife to not happen. Coupled with this the overwhelming acceptance and interaction with social networking sites such as Flickr and Facebook is presumably priming people to accept digital photo capture and exchange often with loosely associated 'others' to be increasingly the norm (boyd and Ellison, 2007). Notions of sharing photos for public consumption have effectively been mainstreamed as a cultural practice over the last few years in ways previously little imagined.

Given this prevalence of media capture and exchange, along with changing perceptions of the role of photography to public access to photos, deployment of digital community boards, as trialled by Taylor et al. (this issue) seems likely to increase. With it however there are a variety of issues which will need to be addressed and further considered in developing research literatures. Of particular interest here are issues of ownership and control not just of the underlying infrastructures but also of the content once shared. Issues raised by Taylor et al.'s work (this issue) explore some of the problems encountered with community participation in a public display and the ways in which content can be regulated by user consent and approbation. However, with truly massively public displays (imagine if you will an interactive display at a large transport hub such as a city's central train station), where communities of users might be more transient and fleeting in their interactions with such devices, control over access and regulation of content must be considered in new ways. We would not wish to imply that these issues are irresolvable in any way, but would argue that they have yet to be significantly addressed by research.

Beyond mere access to the services in public displays there is also the issue of data ownership. If nothing else, experience of social networking sites and internet media sharing sites such as YouTube should teach us that legal issues of copyright have yet to be adequately described and accounted for. As such, more research will need to be done to understand how people will want their shared data on community displays being used. Whilst it might seem fair that people will not be opposed to the archiving of shared content (and to be honest there is a strong argument for such an approach given the rich potential for social analysis of trends in a variety of research areas should this happen) there could potentially be far more consternation if such data was then passed to corporations mining the data for business use. Such practices however would form a particularly beneficial business model for public display boards and offer a ready incentive to those who might wish to run them. These issues require interdisciplinary research from those engaged in critical debates in ethics, law and economics as well as the HCI researchers who normally would be called upon to explore the social and interactional implications of such devices.

Photo sharing activities in and of themselves are normally viewed as benign and simple areas of study. However, it is evident to us that notions of community building and the bringing of people together through photoware technologies in the

community-public behaviour setting is actually a richly complex issue. This area is much under-studied, and we assume that building on the efforts presented in this Special Issue there will be much further work to come in this space.

Conclusions

In the preceding sections, we have presented some reflections on contemporary digital photography. Our hope is that by framing the articles included in this Special Issue in terms of collocated social practices, we have demonstrated that there are a range of ways to think about what people do with their photos and why particular practices are important to them. Our aim has been to encourage further thinking about such practices as recollection and reflection, self-presentation, and the communication around photographic content. As we suggested earlier, there are of course many more ways that the included articles could have been understood. Our overall point to this introduction, though, has been to capture a feel for the changing landscape of related research. Not to survey it in its entirety, but as with photography itself, to offer a way of seeing and preserving a view onto the world.

In conclusion, we want to briefly discuss what such a framing of digital photography might contribute to HCI. Building on the ideas so far, and elaborating further on the included articles, we discuss three general issues that appear to be shaping and are likely to go on shaping research into collocated social practices surrounding photos.

The Impact Social Practices Have on Technology

The first point we wish to make is possibly the most obvious. Above, and in the articles that follow, it is evident that by examining the social character of photo-related activities, and framing them in terms of practices like remembering, self-expression and communication, we gain some useful insights into the design of the mediating technologies. When wearable cameras (Fleck and Fitzpatrick) or distributed photo-taking systems (Patel et al.) are considered as integral to remembering, for example, we discover particular strengths and weaknesses of the technologies, and consequently options for further enhancing them. The technologies come to be seen not just as cognitive prostheses designed to augment episodic memory, but also as active agents in the collective practices of reflecting on and re-imagining the past. Alternatively, when considered in terms of self-expression, such forms of photo sharing can be seen as the means by which we participate in social relations; the ways we collectively share and display our photos, either in our physical environments (Patel et al.; Durrant et al.) or online (Van House), make visible our ties to or, indeed, fractures with friends, loved ones and family. What we begin to see, then, is how things like remembering and self-expression are accomplished and, in some cases, how such accomplishments might be further supported by new technologies. More generally, it becomes clear that a deeper understanding of the social practices associated with digital photography is likely to better inform technology design.

Technology's Impact on Social Practice

Beyond thinking about new design directions, our intention has been to remark on the transformations in social practices afforded by new digital, photographic technologies. We have described how the automatic capture of photos (Fleck and Fitzpatrick), the collective participation in photo-taking (Patel et al.), the association of photos with physical memorabilia (Nunes et al.), and so on, are all practices

enabled by the increasing availability of ubiquitous computing technology. Similarly, the established practices of viewing photos together have been subject to change (Durrant et al.); novel techniques for physically interacting with digital photos (Kray et al.; Nunes et al.) and the plethora of online systems available for distributing them (Van House; Taylor et al.) bring new qualities to the photographic experience. On the one hand they allow content to be associated with personally significant objects and on the other they mean that same content can be made immediately available to an extremely large and distributed audience. Predictably, perhaps, our aim here is to draw attention to how the collective social practices surrounding photos are transforming alongside technological developments. The changes may be tightly enmeshed with many factors and thus hard to predict, but nevertheless it is evident the technologies enabling collective interaction are leading photography to be experienced differently. As we move forward, the focus for those of us in HCI might thus be to elaborate on these evolving couplings of technology and social practice. As we see in this issue, such couplings have the potential to significantly transform not just the ways we experience photos, but also how we understand being together.

Socio-Technical Configurations

The final point we wish to raise closely relates to this potential for transformations in experience. It would seem the many new and in some cases radically different ways of taking, saving and viewing photos are shaping some of those things we consider fundamental to ourselves and our relations with others. For example, we have hopefully given some sense of the impact emerging technologies are having on what it is to remember, express oneself, and communicate. We see that such things are shaped, or configured, through our technology-mediated relations with others. So the immediacy of remote photo sharing, the capacity to easily distribute photos across multiple sites and to interconnect them with others' content, and so on all alter how we think of our interpersonal relations. These possibilities have clearly had an effect on our remote communications; our relations now seem more widespread than ever, but at the same time they also seem more fleeting. Thus, we can, at times at least, feel less bound to one another. As we see from some of the included articles, however, the idea of communication between those physically together is also under pressure. The ability to 'leave' digital content with physical artefacts or instantaneously distribute a snapped photo across multiple, collocated devices changes the relationships we have with each other over time and space, even if only subtly. For instance, Patel et al.'s MobiPhos (this issue) muddies the distinction between collocated and remote presence. Using the system's distributed devices, users who are within shouting distance find themselves awkwardly positioned between being collocated and remote. In use, the technology transforms physical relations and in doing so precipitates the emergence of new spatial categories. For HCI, this highlights the importance of investigating the socio-technical couplings, and how they come to (re-)configure not just our social practices, but also, perhaps, what we think it might mean to be social.

The articles to follow demonstrate, then, that the ongoing work into the collocated social practices surrounding photos continues to grow as a distinctive research area. The assembled articles show how the area continues to draw on and contribute to the technological innovations in HCI as well as its growing corpus of empirical studies. Our aim in this introduction has been to elaborate on these strands of research through example and set out some broad trajectories for future work. By developing perspectives on the ways we remember, express ourselves and communicate through

photos, we hope to have given shape to a research trajectory that can further refine the insights made into social practice. At a more fundamental level, our aim has also been to provoke questions about the relations people have with both technology and each other.

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References

Ahern, S., Eckles, D., Good, N. S., King, S., Naaman, M., Nair, R., 2007. *Over-exposed?: privacy patterns and considerations in online and mobile photo sharing*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 357–366.

Ames, M., Naaman, M., 2007. *Why we tag: motivations for annotation in mobile and online media*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 971–980.

Apted, T., Kay, J., Quigley, A., 2006. *Tabletop sharing of digital photographs for the elderly*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 781–790.

Balabanoviç, M., Chu, L. L., Wolff, G. J., 2000. *Storytelling with digital photographs*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 564-571.

Barker, R. G. *Ecological Psychology.* Stanford University Press, Palo Alto, CA, 1968.

Bell, G., Blythe, M., Sengers, P., 2005. Making by making strange: defamiliarization and the design of domestic technologies. *ACM Transactions on Computer-Human Interaction 12* (2), 149-173.

Berger, J. *About Looking.* Vintage International, New York, 1980.

boyd, d., Ellison, N., 2007. Social networking sites: definition, history, and scholarship. *Journal of Computer-Mediated Communication 13* (1), 210-230.

Brignull, H., Izadi, S., Fitzpatrick, G., Rogers, Y., Rodden, T., 2004. *The introduction of a shared interactive surface into a communal space*. In: Proceedings of the 2004 ACM conference on Computer supported cooperative work, ACM, New York, 49–58.

Bruner, J. *Acts of Meaning.* Harvard Press, Cambridge, MA, 1990.

Chalfen, R., 1998. Family photograph appreciation: dynamics of medium, interpretation, and memory. *Communication and Cognition 31* (2-3), 161-178.

Chalfen, R. *Snapshot Versions of Life.* Bowling Green State University Popular Press, Bowling Green, Ohio, 1987.

Crabtree, A., Rodden, T., 2004. Domestic routines and design for the home. *Computer Supported Cooperative Work 13* (2), 191-220.

Crabtree, A., Rodden, T., Mariani, J., 2004. *Collaborating around collections: informing the continued development of photoware*. In: Proceedings of the 2004 ACM conference on Computer supported cooperative work, ACM, New York, 396-405.

Drazin, A., Frohlich, D., 2007. Good Intentions: Remembering through Framing Photographs in English Homes. *Ethnos 72* (1), 51–76.

Durrant, A., Frohlich, D., Sellen, A., Lyons, E., this issue. Home curation versus teenage photography: photo displays in the family home *International Journal of Human-Computer Studies.*

Durrant, A., Taylor, A.S., Frohlich, D., Sellen, A., Uzzell, D., 2009. *Photo Displays and Intergenerational Relationships in the Family Home*. In: Proceedings of the 23rd BCS conference on Human computer interaction, BCS Press, 10-19.

Durrant, A., Taylor, A. S., Taylor, S., Molloy, M., Sellen, A., Frohlich, D., Gosset, P., Swan, L., 2008. *Speculative devices for photo display*. In: CHI ‘08 extended abstracts on Human factors in computing systems, ACM, New York, 2297-2302.

Fleck, R., Fitzpatrick, G., this issue. Teachers' and tutors' social reflection around SenseCam images. *International Journal of Human-Computer Studies.*

Flynn, B. Geography of the digital hearth, 2003. *Information, Communication & Society 6* (4), 551-576.

Frohlich, D., Kuchinsky, A., Pering, C., Don, A., Ariss, S., 2002. *Requirements for photoware*. In: Proceedings of the 2002 ACM Conference on Computer supported cooperative work, CSCW '02, ACM, New York, 166-175.

Frohlich, D. M. *Audiophotography: Bringing Photos to Life with Sounds.* Kluwer Academic, Dordrecht, 2004.

Graves Petersen, M., 2007. *Squeeze: designing for playful experiences among co-located people in homes*. In: CHI '07 extended abstracts on Human factors in computing systems, ACM, New York, 2609–2614.

Harper, R., Randall, D., Smyth, N., Evans, C., Heledd, L., Moore, R., 2008. *The past is a different place: they do things differently there*. In: Proceedings of the 7th ACM conference on Designing interactive systems ACM, New York, 271-280

Hirsch, M. Family Frames: *Photography, Narrative and Postmemory*. Harvard University Press, Cambridge, MA, 1997.

Hodges, S., Williams, L., Berry, E., Izadi, S., Srinivasan, J., Butler, A., Smyth, G., Kapur, N., Wood, K., 2006. *SenseCam: a retrospective memory aid*. In: Proceedings of the 8th international conference on Ubiquitous computing, Springer, 177-193.

Ito, M., Okabe, D., Matsuda, M. *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life.* The MIT Press, 2006.

Kim, J., Zimmerman, J., 2006. *Cherish: Smart Digital Photo Frames*. In: Proceedings of the conference on Design and Emotion. Design and Emotion Society.

Kindberg, T., Spasojevic, M., Fleck, R., Sellen, A., 2005. The Ubiquitous Camera: an In-Depth Study of Camera Phone Use. *IEEE Pervasive Computing 4* (2), 42-50.

Kirk, D., Izadi, S., Sellen, A., Taylor, S., R., B., Hilliges, O., in press. *Opening up the Family Archive*. To appear in: Proceedings of the 2010 ACM conference on Computer supported cooperative work, ACM, New York.

Kirk, D., Sellen, A., Rother, C., Wood, K., 2006. *Understanding photowork*. In: Proceedings of the SIGCHI conference on Human Factors in computing systems, ACM, New York, 761–770.

Kray, C., Rohs, M., Hook, J., Kratz, S., this issue. Bridging the gap between the Kodak and the Flickr generations: a novel interaction technique for collocated photo sharing. *International Journal of Human-Computer Studies.*

Lindley, S.E., Harper, R., Randall, D., Glancy, M., Smyth, N., in press. *Frozen in time and "time in motion": mobility of vision through a SenseCam lens*. To appear in: Proceedings of the 11th international conference on Human-computer interaction with mobile devices and services, ACM, New York.

Lindley, S.E., Monk, A.F., 2008. Social enjoyment with electronic photo displays: Awareness and control. *International Journal of Human-Computer Studies 66* (8) 587-604.

Lindley, S.E., Randall, D. Sharrock, W., Glancy, M., Smyth, N., Harper, R., in press. *Narrative, memory and practice: tensions and choices in the use of a digital artefact*. To appear in: Proceedings of the 23rd BCS conference on Human computer interaction, BCS Press.

Marsden, G., 2003. Using HCI to leverage communication technology. *interactions. 10* (2), 48–55.

Martin, H., Gaver, B., 2000. *Beyond the snapshot from speculation to prototypes in audiophotography*. In: Proceedings of the 3rd conference on Designing interactive systems, ACM, New York, 55–65.

Miller, A. D., Edwards, W. K., 2007. *Give and take: a study of consumer photo-sharing culture and practice*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 347–356.

Nunes, M., Greenberg, S., Neustaedter, C., this issue. Using physical memorabilia as opportunities to move into collocated digital photo sharing. *International Journal of Human-Computer Studies.*

Patel, N., Clawson, J., Voida, A., Lyons, K., this issue. MobiPhos: a study of user engagement with a mobile collocated-synchronous photo sharing application. *International Journal of Human-Computer Studies.*

Peltonen, P., Kurvinen, E., Salovaara, A., Jacucci, G., Ilmonen, T., Evans, J., Oulasvirta, A., Saarikko, P., 2008. *It's Mine, Don't Touch!: interactions at a large multi-touch display in a city centre*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 1285–1294.

Petrelli, D., Whittaker, S., Brockmeier, J., 2008. *AutoTopography: what can physical mementos tell us about digital memories?* In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 53–62.

Rodden, K., Wood, K. R., 2003. *How do people manage their digital photographs?* In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 409-416.

Sarvas, R., Oulasvirta, A., Jacucci, G., 2005. *Building social discourse around mobile photos: a systematic perspective*. In: Proceedings of the 7th international conference on Human-computer interaction with mobile devices and services, ACM, New York, 31-38.

Schoggen, P. *Behavior Settings.* Stanford University Press, Palo Alto, CA, 1989.

Shen, C., Lesh, N., Vernier, F., 2003. Personal digital historian: story sharing around the table. *interactions 10* (2), 15-22.

Slater, D. Domestic photography and digital culture. In Lister, M. (Ed.), *The photographic image in digital culture.* Routledge, London, 1995, 129-146.

Sontag, S. *On Photography.* Farar, Straus & Giroux, New York, 1977.

Spence, J., Holland, P. (Eds.). *Family snaps: The meanings of domestic photography.* Virago, London, (1991).

Ståhl, A., Höök, K., Svensson, M., Taylor, A.S., Combetto, M., 2008. Experiencing the affective diary. *Personal and Ubiquitous Computing 13* (5), 365-378.

Swan, L., Taylor, A. S., 2008. *Photo displays in the home*. In: Proceedings of the 7th ACM conference on Designing interactive systems, ACM, New York, 261-270.

Taylor, N., Cheverst, K., this issue. Social interaction around a rural community photo display. *International Journal of Human-Computer Studies.*

Tolmie, P., Crabtree, A., Rodden, T., Greenhalgh, C., Benford, S., 2007. *Making the home network at home: digital housekeeping*. In: Proceedings of the 10th European conference on Computer supported cooperative work, Springer, 331-350.

Van House, N., this issue. Collocated photo sharing, story-telling, and the performance of self. *International Journal of Human-Computer Studies.*

Van House, N., Davis, M., Ames, M., Finn, M., Viswanathan, V., 2005. *The uses of personal networked digital imaging: an empirical study of cameraphone photos and sharing*. In: CHI '05 extended abstracts on Human factors in computing systems, ACM, New York, 1853-1856.

Voida, A., Mynatt, E. D., 2005. *Six themes of the communicative appropriation of photographic images*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 171-180.

Voida, A., Greenberg, S., 2009. *Wii all play: the console game as a computational meeting place*. In: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, New York, 1559-1568.

Wilson, A. D., Izadi, S., Hilliges, O., Garcia-Mendoza, A., Kirk, D., 2008. *Bringing physics to the surface*. In: Proceedings of the 21st annual ACM symposium on User interface software and technology, ACM, New York, 67-76.