

'Designing for Crowds' workshop proposal, Pervasive 2010

Organisers

Stuart Reeves

Dept. of Computing Science, University of Glasgow, Glasgow, UK.
stuartr@dcs.gla.ac.uk

Scott Sherwood

Dept. of Computing Science, University of Glasgow, Glasgow, UK.
sherwood@dcs.gla.ac.uk

Oskar Juhlin

Mobile Life @ Interactive Institute, Stockholm, Sweden.
oskarj@tii.se

Kenton O'Hara

Microsoft Research Cambridge, 7 J J Thomson Avenue, Cambridge, UK
v-keohar@microsoft.com

Primary contact: Stuart Reeves, University of Glasgow

Introduction

As part of the growing ubiquity and pervasive reach of technology, there has been, accordingly, expanding interest in how interaction with technology in public and semi-public places plays out [6]. Stadiums, music and performance festivals, and urban centres are just some of the spaces in which mobile phones, digital photography, large screens and other projections, and infrastructures such as RFID, are deployed by and for large congregating masses of people. The crowd formations found within these settings pose exciting new challenges for the design and implementation of technology. In this workshop, we seek to address the issues surrounding the integration of crowd action with the highly varied assemblies of technology that perhaps exist already within these spaces or will be deployed in them in the near future.

Furthermore, the distinctive nature of crowds also suggests a new conceptual domain in which, moving from single user perspectives, the crowd as a whole becomes the unit for analysis and design. Drawing upon existing understandings of tightly integrated workplace collaborations with technology (e.g., [7]), home use patterned around everyday interactions between family members (e.g., [3]), and performance scenarios in which explicit or opportunistic conduct with technology by 'performers' is spectated upon [4], the workshop aims to help build up this new domain. As part of this the organisers also hope to expand upon their own recent work on mobile and ubiquitous technology [8], situated displays [5] and public settings [6, 4], all of which involve crowd elements.

In addressing these and other issues, we intend to pick apart the nature of crowd formations and their relevance as a site for design and technology development in human-computer interaction in general. As part of this we will be interested in developing our understanding of crowds as a practically achieved social phenomena, how existing technologies are woven into this practice, and the ways in which pervasive technologies can be designed to fit or perturb crowd phenomena.

Aims and purposes

Crowds often may be formed by groups of people with some level of shared sense, purpose and togetherness. In the workshop, whilst being wary of attempting to define 'crowds', we will seek to explore the challenges unique to crowds through examining a range of different types and forms of crowds, such as groups of sports fans, crowds gathering around performers or public displays, or crowds at festivals and musical events. We note that even with more well-researched technologies, such as large interactive screens, there remain few empirical studies of how actual user practices and interaction in such crowd settings takes place [5]. As such the focus of our workshop will attempt to redress this lack of studies within the domain.

The workshop will offer for participants a forum in which to share empirical data with other researchers who are also concerned with understanding and designing technology for crowd environments (i.e., a 'data session' format, see next section). This sharing of data offers three main benefits for workshop participants:

1. *Sharing experiences of diverse settings.* Through collecting and sharing this data, we hope to examine between us novel settings which receive little attention from HCI and pervasive or ubiquitous computing. Each participant will hopefully enrich their range of experience through this. For example, we would value further experience of the relatively unexplored settings of sports crowds, clubs and festivals.
2. *Sharing experience of different crowd interaction forms and formations.* The workshop should assist participants' understandings of how crowds conduct themselves. For example, this might be obtained through analysis of localised interactions amongst subsections of the crowd, global actions coordinated across the crowd at large, imitation and cascading behaviours, examining crowd formation through attraction at-a-distance and how this relates to the spontaneity of interaction in crowds, or how bystanders transition to becoming a member of the crowd.
3. *Sharing diverse exhibits of technology-in-action.* The data we share should offer the workshop participants empirical examples of technology in action, such as interaction with large screens, mobile phones dispersed within crowds, and so on. Collective analytic work on these exhibits of technology-in-action will help highlight the differences and similarities between the settings, the interactional forms and formations of crowd types.

As part of this the workshop would seek to recognise crowds as a distinct form of public setting scenario that is of interest to design, and to situate this

within the context of existing studies of public settings (particularly audience and performer scenarios) that are present in HCI. The data session format provides an ideal way to compare commonalities and differences in crowd formations and technology deployments within crowds, and begin to piece together the ways design might be approached for these spaces. A further key goal of the workshop will be to begin the development of frameworks and recommendations for technology design.

Finally we will seek to produce documented outcomes from the workshop that derive from the data analysis we conduct together. For example, this might be a journal special issue, or perhaps collectively authored journal or conference papers based upon the analysis during the workshop.

Related workshops

One previous workshop that we are aware of which has been concerned with similar topics was the CHI 2009 workshop on 'crowd computer interaction' [1]. This workshop was organised in order to "identify[...] foundational materials, canonical examples, and key gaps in our knowledge of crowd interactions" and, practically speaking, "promote discussion and thought using a combination of hands-on crowd-based exercises and short paper presentations" [2]. We differentiate our workshop as being more data-driven, revolving around collective analysis around shared research materials, rather than featuring paper presentations or exercises.

Format of the workshop

In order to share data between researchers, the workshop would take the format of a 'data session' in which participants briefly present (e.g., 5 mins) the background and context to their data (e.g., video, audio, ethnographic collections), which is then explored collectively by those present. In doing this, each participant would bring their particular expertise and interests to the data and offer their observations on the ways in which those captured in it behave. These observations can then drive discussions on how to develop design frameworks or recommendations in order to contribute to HCI.

Typically we would favour video recordings or other primary data sources (e.g., interviews) as these offer a greater potential shared analysis. In addition to this, we would favour a fairly open format to the number and nature of the data sessions within the workshop and have scheduled slots in our programme accordingly. Each data session slot could account for either one or two presentations of participants' data, however given our desire to have a more flexible format, if a particular data set proves fruitful for analysis then more time could be spent on this.

Ideally the workshop would involve at most 15 participants (including organisers) and contain at most 6 participants presenting data submissions. Through running data sessions ourselves we recognise that these sessions are typically most useful when smaller numbers are involved, as this offers a more discussion-based setting whereas larger numbers of participants would tend towards a seminar-style present-from-the-front approach.

Approximate schedule

09:00 – 09:30 Brief introductions

Introductions by workshop organisers briefly outlining the purposes of the workshop and going through the schedule, particularly highlighting how the data sessions should lead into the discussion session at the end. Introductions by each of the participants indicating their interests etc.

09:30 – 11:00 Data session 1

11:00 – 11:30 Break for refreshments

11:30 – 13:00 Data session 2

13:00 – 14:30 Lunch

14:30 – 16:00 Data session 3

16:00 – 16:30 Break for refreshments

16:30 – 17:30 Discussion – divide into groups of 4 or 5 (depending upon numbers)

The discussion section of the workshop would involve participants dividing into smaller groups (in order to assist discussion), and addressing questions such as the following (including any which arise over the course of the workshop): What are the commonalities across the data of crowds? What are the differences between the crowd examples? Where technology features, how is crowd interaction perturbed (or repaired etc.)? Through examining these commonalities and differences in the interactional features across crowd settings, can we create frameworks to support designers in implementing crowd-based technologies?

Submissions and participants

In order to attend the workshop, participants will be required to submit a short position paper outlining their interests and work with crowds and technology. In addition to this, we would encourage participants to also present their data at the workshop, in which case we would request they submit relevant sections of their data in some form, such as outlines of ongoing analysis, video vignettes, and so on. We would also share these submissions between participants before the workshop.

We will set up a website for the workshop to detail what is expected of submissions – i.e., soliciting for participants to present their own data at our workshop. We will also directly contact existing ‘data session’ style groups within HCI and CSCW fields as well as other analysis groups with interests in technology in action. In addition to advertising the workshop on relevant mailing lists, we will seek to attract participants via direct invitations to submit their data for analysis.

Organisers

Stuart Reeves is currently a Research Assistant at the Department of Computing Science, University of Glasgow. His research work is typically concerned with interfaces and technology situated within public or semi-public settings, with particular focus upon performance and spectatorship.

His current project involves developing technology to support sports fans at and around stadiums.

Scott Sherwood is currently a Research Assistant at the Department of Computing Science in the University of Glasgow. He is interested in how individuals conduct themselves in public spaces modifying their behaviour appropriately. He is most interested in technology that can support individuals and groups adapt the façade given and given-off. His current projects include the Stadiums project and the Contextual Software project at Glasgow. His work on these projects involves the design and development of adaptive component architectures that can be used to support sports fans in and around stadiums.

Oskar Juhlin is Co-Director at the Mobile Life VinnExcellence Center. He is also Studio Director of the Mobility Studio at the Interactive Institute, Stockholm, Sweden. He is a researcher at the Department of computer and system sciences at Stockholm University and Associate Professor in applied information technology at the IT-university of Göteborg. Oskar is interested in crowd-screen interaction in public places, and in particular public sports bars.

Kenton O'Hara is Senior Researcher in the Socio Digital Systems Group at Microsoft Research in Cambridge and visiting researcher at the Pervasive Media Studio, Bristol. His research explores everyday practices and social behaviours relating to mobile and ubiquitous computing and digital displays in public spaces. He has authored 60 publications and 2 books on and public displays and collaborative music consumption. Kenton has previously worked at SIRO in Australia as Director of the HxI Initiative, HP Labs, Rank Xerox EuroPARC and the Appliance Studio. He is on the advisory board for iShed, a founding partner organisation along with HP Labs of the Pervasive Media Studio. He has worked on numerous award winning projects including the BBC's BAFTA and Royal Television Society award winning 'Coast' mobile experience.

References

1. <http://www.metamanda.com/crowdcomputing/call.html>
2. Brown, B. et al. Crowd computer interaction. In Proc. CHI (Extended Abstracts), pp. 4755-4758. ACM Press, 2009.
3. Brown B. et al. Locating Family Values: A Field Trial of the Whereabouts Clock. In Proceedings of UbiComp 2007. Innsbruck, Austria. Springer, 354-371.
4. Benford, S. et al. The frame of the game: Blurring the boundary between fiction and reality in mobile experiences. In Proc. CHI, pp. 427-436. ACM Press, 2006.
5. O'Hara, K., Glancy, M., and Robertshaw, S. Understanding collective play in an urban screen game. In Proc. CSCW, pp. 67-76. ACM Press, 2008.
6. Reeves, S. et al. Designing the spectator experience. In Proc. CHI, pp. 741-750. ACM Press, 2005.

7. Heath, C. and Luff, P. K. Collaboration and control: Crisis management and multimedia technology in London Underground line control rooms. *JCSCW*, 1(1- 2):69-94, 1992.
8. Esbjörnsson, M. et al. Watching the cars go round and round: designing for active spectating. In *Proc. CHI '06*. ACM Press, pp. 1221-1224, 2006.