

---

# Large Displays in Urban Life – from Exhibition Halls to Media Facades

extended abstract

**Uta Hinrichs**

University of Calgary  
2500 University Drive NW  
Calgary, T2N 1N4, Canada  
uhinrich@ucalgary.ca

**Nina Valkanova**

Universitat Pompeu Fabra  
C/Tanger 122-140, E-08018  
Barcelona, Spain  
nina.valkanova@upf.edu

**Kai Kuikkaniemi**

Helsinki Institute for Information  
Technology  
P.O. Box 9800, 02015 TKK  
Finland  
kai.kuikkaniemi@hiit.fi

**Giulio Jacucci**

Helsinki Institute for Information  
Technology  
P.O. Box 9800, 02015 TKK  
Finland  
giulio.jacucci@hiit.fi

**Sheelagh Carpendale**

University of Calgary  
2500 University Drive NW  
Calgary, T2N 1N4, Canada  
sheelagh@ucalgary.ca

**Ernesto Arroyo**

Universitat Pompeu Fabra  
C/Tanger 122-140, E-08018  
Barcelona, Spain  
ernesto.arroyo@upf.edu

**Abstract**

Recent trends show an increasing prevalence of large interactive displays in public urban life. For example, museums, libraries, public plazas, or architectural facades take advantage of interactive technologies that present information in a highly visual and interactive way. Studies confirm the potential of large interactive display installations for educating, entertaining, and providing evocative experiences. This workshop will provide a platform for researchers and practitioners from different disciplines to exchange insights on current research questions in the area. The workshop will focus on how to design large interactive display installations that promote engaging experiences that go beyond playful interaction, and how to evaluate their impact. The goal is to cross-fertilize insights from different disciplines, establish a more general understanding of large interactive displays in public urban contexts, and to develop an agenda for future research directions in this area.

**Keywords**

Large display interaction, public spaces, user experience, interaction and content design..

**ACM Classification Keywords**

H5.m. Information interfaces and presentation: Misc.

## General Terms

IxD Design, Evaluation, Interdisciplinary Research.

## Introduction

Recent years have shown a proliferation of large interactive displays in urban life environments. As low-cost display technologies are developing rapidly, it is likely that this trend will accelerate, and that people will become more accustomed to using media in public urban spaces. Large interactive display installations with their visual presence and their support of novel interaction techniques have the potential to enhance public spaces by promoting active engagement with the displayed content. However, urban life, with its social and cultural practices, differs from the business and private aspects of human life where interactive technology has become more common. Public urban spaces can be characterized by a broad and diverse flux of information and people, who are immersed in their own personal agendas and social interactions. People's interactions and experiences of public large displays are influenced by their distinctive contextual characteristics. Addressing these contextual characteristics within the design and evaluation of large display installations can be challenging. This workshop will address three topics of concern in particular: 1.) How can we design large interactive installations that hold people's attention past the initial 'wow factor' and novelty effect and direct their interest toward the presented content? 2.) How do different interaction models shape people's experience of large display installations in urban spaces? and 3.) What methods are appropriate to evaluate particular aspects of public large display installations, such as engagement or impact? In the following sections we describe several aspects detailing these discussion topics, including different approaches from research and practice in art, architecture, design, HCI, and media theory.

## Research and Design across Disciplines

Various disciplines are involved in the design, development, and/or evaluation of large displays in public urban spaces. Research and practice from HCI, design, and media theory has been investigating the challenges and potential represented by large interactive displays in public urban spaces [3,11,13]. Studies have focused on social aspects of public displays [2,4,6,8], and how interaction around such displays evolves in different public settings [4,5,7]. Researchers in art and media architecture have also explored the potential of large urban displays as interfaces that can trigger emotional responses and promote communication [1,10].

While insights from these different disciplines are very valuable in themselves, we as a young community still lack intercommunication that may lead to a conceptualization of these findings. The disciplines involved in public large display research have approaches of developing their projects and publishing their findings, which makes it hard to maintain an awareness of new trends in the area. A major goal of this workshop is to bring together the different communities involved in the design and evaluation of large displays for public urban spaces and share experiences, insights, and future visions. By considering an interdisciplinary approach drawing from both scientific, artistic, and design practices, we can work towards a framework that furthers joint understanding.

## Designing For Engaging Experiences

The three discussion topics this workshop will address incorporate considerations of interaction paradigms, content design, supporting individual and social experiences and evaluation. All these aspects need to consider the architectural context of the large display installation, its exposure to a diverse audience, the shared use between peers and strangers as well as the brief interaction times.

In the following we discuss these aspects in the light of our three discussion topics.

#### *Interaction Paradigms*

Engaging experiences require more than novel technology and interaction techniques. We believe that interaction paradigms need to support the discovery and engagement with content beyond playfulness. In this workshop we will discuss how to design large interactive installations that extend people's attention past the initial 'wow factor' and direct their interest toward the presented information. Also, since public displays are located in environments where passers-by encounter them in a serendipitous way the support of 'pass-by/walk-up-and-use' interaction is an important factor. Consequently, how can different interaction methods shape people's experience of large display installations in urban spaces?

#### *Content Design*

A challenging task in the urban domain is the design of content that supports the communicative goals and intentions of the display. Large urban displays require information representations that differ from those used in personal computers or static media. The architectural and contextual characteristics of the space, as well as the display-specific parameters like scale, resolution, brightness and exposure, play a vital role in the perception of the display and hence have an influential weight on the design process. A visually aesthetic, metaphoric, and/or artistic representation of content can evoke curiosity and convey meaning while leaving room for open interpretation and discussions [4, 9, 13]. Furthermore, principles of audiovisual language can be used to lead people through content and evoke emotions [10]. During the workshop we will aggregate, discuss, and invent cross-disciplinary strategies that may guide people's attention toward and

through the content on large interactive displays in public spaces and promote discussion and reflection.

#### *Supporting Individual & Social Experiences*

Studies have shown that people predominantly approach public large displays in groups and often engage in social interactions around these displays [4, 5, 7, 8]. Phases of social exploration alternate with phases of individual interaction [4]. The form factor of large displays invites for simultaneous interaction of multiple people that do not necessarily know each other. Depending on the public context and intention of the display, the potential of unintentional interferences between people interacting with the display at the same time needs to be considered through design. The question of how to support both individual and social experiences of public large displays installations will be discussed with a goal to generate new ideas about the interplay between public, private, and social interaction in context of large public displays.

#### *Evaluating the Impact of Large Public Displays*

Evaluating the success and impact of large public displays is a challenge. Controlled laboratory studies can lead to valuable results applicable in public contexts. However, they cannot accurately reproduce people's experiences in public spaces. Furthermore, factors such as engagement, affection, or immersion are difficult to measure reliably. A number of field studies have explored people's experiences with large displays in different public environments [4,5,7,8]. While these studies have led to valuable insights, it is important that we start to integrate their findings into a coherent evaluation framework. Such a framework can, for instance, help to develop low-cost heuristic evaluation methods. In the long run, adequate and effective evaluation methods will develop a fundamental understanding of how large public displays change the experience of the space they are installed in and, vice

versa, how the public space changes the experience of large public displays. Workshop discussions will address how the impact of large display installations in urban settings can be measured, what methods are adequate, and when during the design process and installation they can be applied.

### Workshop contributions

So far, research around public large displays has taken place in different communities such as art, architecture, design, and HCI that do not necessarily apply the same methods and share the same goals. This workshop will provide a platform to promote interdisciplinary discussion about the design and evaluation of large displays in public urban settings. This discussion will allow us to begin aggregating current findings, to inspire new ways of thinking, and to generalize across disciplines, working towards building a general understanding of this young research area. More specifically we will start to develop frameworks that can lead to 1.) Consolidated cross-disciplinary design strategies, and 2.) Low-cost heuristic evaluation methods for public urban large display installations. Furthermore, we will discuss future trends and research directions in this area, incorporating the ideas of the different disciplines involved in the workshop. We as the workshop organizers will summarize the workshop results in a journal publication. This workshop can be the seed for establishing a growing research community where researchers and practitioners from different disciplines can actively share information and enrich their design and research practices through a better understanding of processes and practices in use in other disciplines.

### References

- [1] Bounegru, L. Interactive Media Artworks for Public Space: The Potential of Art to Influence Consciousness and Behaviour in Relation to Public Spaces. In *Urban Screens Reader*, pp. 199-216, 2009.
- [2] Brignull, H. & Rogers, Y. Enticing people to interact with large public displays in public spaces. In *Proc. of INTERACT*, pp. 17-24, 2003.
- [3] Dalsgaard, P. and Halskov, K. Designing Urban Media Façades: Cases and Challenges. In *Proc. of CHI*, pp. 2277-2286, 2010.
- [4] Hinrichs, U., Schmidt, H. and Carpendale, S. EMDialog: Bringing information visualization into the museum. *IEEE TVCG*, 14(6): 1181 – 1188, 2008.
- [5] Hornecker, E. “I don’t understand it either but it is cool”: Visitor interactions with a multi-touch table in a museum. In *Proc. of IEEE Tabletop*, pp. 121 – 128, 2008.
- [6] Hornecker, E., Marshall, P. and Rogers, Y. From entry to access—how shareability comes about. In *Proc. of DPPI*, pp. 328–342, 2007.
- [7] Jacucci, G., Morrison, A., Richard, G., Kleimola, J., Peltonen, P., Parisi, L. and Laitinen, T. Worlds of Information: Designing for Engagement at a Public Multi-Touch Display. *Proc. CHI’10*, pp. 2267-2276, 2010.
- [8] Peltonen, P., Kurvinen, E., Salovaara, A. and Jacucci, G. “It’s mine, don’t touch!”: Interactions at a large multi-touch display in a city centre. In *Proc. of CHI*, pp. 1285—1294, 2008.
- [9] Schmidt, H., Hinrichs, U., Dunning, A. and Carpendale, S. Memory [en]code – Building a collective memory within a tabletop installation. In *Proc. of CAe*, pp. 135 – 142, 2007.
- [10] Snibbe, S.S. and Raffle, H.S. Social immersive media: pursuing best practices for multi-user interactive camera/projector exhibits. In *Proc. of CHI*, pp. 1447 – 1456, 2009.
- [11] Strupek, M. The social potential of urban screens. In *Journal for Visual Communication vol.5 no.2*, pp. 173-188, 2006.
- [12] Valkanova, N. Interface Design for Shared Spaces: towards a more affective relationship between people, places, and information. To appear in *Proc. of MediaCity*, 2010.
- [13] Valkanova, N., Moghnieh, A., E. Arroyo, and J. Blat. AmbientNEWS: Augmenting Information Discovery in Complex Settings Through Aesthetic Design. In *Proc. Of IV’ 10*, pp. 439-444, 2010