

# When Does the Public Look at Public Displays?

Elaine M. Huang

<sup>1</sup> RWTH Aachen University, Media Computing Group, Ahornstrasse 55  
52074 Aachen, Germany  
huang@cs.rwth-aachen.de

**Abstract.** This work reports on the preliminary findings of a field study examining the current use practices of large ambient information displays in public settings. By understanding how such displays are already being used in non-research settings, we offer concrete, ecologically valid knowledge and design implications about these technologies to researchers and designers who are employing large ambient displays in their work.

**Keywords:** Large displays, field studies, qualitative methods, ambient displays.

## 1 Introduction and Motivation

There is a growing body of work that seeks to take advantage of large displays for the purpose of displaying awareness and other types of non-critical information to individuals in public areas. Research prototypes such as the Hello.wall ambient information system [2], and interactive public ambient displays [3] are built upon the assumption that passersby will engage in explicit interactions with large display applications after first being drawn to them as ambient displays in the environment. Brignull and Rogers created the Opinionizer prototype that allowed party guests to post opinions to a large display from a nearby laptop [1].

The use of large displays in these and other research prototype systems embodies a set of assumptions regarding the technology and their ability to attract and hold the attention of individuals and groups in a public setting, but the extent to which these assumptions hold true in general is not well known. Much of the work of evaluating such displays has been conducted using research prototypes either in a research setting, or limited public deployment. We seek to understand how people use and react to large displays in public settings by examining *current* (non-research, non-prototype) large ambient information displays showing non-critical information in a variety of full-scale public deployments. We report on the preliminary findings of field observations of 31 large displays located in two mid- to large-sized cities in Western Europe. The aim of this work is to offer researchers and designers concrete, ecologically valid knowledge about the use of large ambient displays in public settings based on actual practices that can be used to ground and inform the design and deployment of future large display information systems.

## 2 Method and Challenges

We performed field observation in a dozen sites, some of which contained multiple instances of large displays for a total of 31 displays. We conducted observations in a wide

variety of contexts, including train stations, a bookstore, a travel agency, a library, main buildings of public universities, a cafeteria, a museum, and a department store. Each site visit lasted at least 60 minutes, and as many as 180 minutes.

Because of the public nature of the sites, we did not use video recording, opting instead for field notes and still photographs when appropriate. Conducting observations in this fashion presented several challenges and had limitations as well. For example, it was generally easy for us to determine when someone turned to look at a display or when someone was reading content. Often we were able to observe very brief glances by people who did not turn their heads or otherwise change body position to look at the displays, but it is likely that we were not able to catch all such instances of these momentary glances. In particularly crowded locations in which people tended to linger rather than pass through, such as a cafeteria, we used a “micro-shadowing” technique which entailed observing an individual or small group of individuals for 5-10 minutes at a time. In most other cases, such as retail locations, the number of people within viewing range of the displays was smaller, or people were merely passing by, thus allowing us to be able to observe all potential viewers at once.

### 3 Findings

**State of the technology:** In general, we found that the technology and content being widely used was relatively simple. The set of public displays for ambient information that we found deployed throughout these two cities consisted almost entirely of non-interactive vertical displays consisting of announcements for services, events, resources, “fun facts,” or products. Examples include a schedule of upcoming lectures in a university, advertisements for gift certificates at a department store, announcements of book signings at a bookstore, and information about financial planning outside a bank. The majority of them were plasma or LCD displays ranging from about 40” to 50” in size, as well as a few wall-projected displays. Most of the displays showed a cycle of several items with or without animation that played in a loop; items usually consisted of a still image, or an image with some minor animation, such as text sliding onto the screen. Occasionally items included short clips of video. We were surprised to find that seven of the displays showed single still images (eg. an advertisement for a newspaper at a bookstore, a picture of an animal at a museum) that did not change, animate, or update the entire duration of our observation.

**Positioning of displays:** Displays were generally either located at approximately eye height or positioned considerably above the head, sometimes near the ceiling (Fig. 1). Both of these positions seemed intended to draw attention, the former likely intended to catch the eye easily and the latter likely intended to be more visible from a distance or from a greater range of locations within the space. Our observations showed that the eye-position was far more effective at attracting glances from passersby, while people rarely looked up at displays located above the head. For example, in one department store, there were seven large plasma displays located throughout the building, mounted at inconsistent heights, all showing similar content about products and services available at the store. Though glances at the displays were all generally brief, lasting about 1-2 seconds, those items located at eye level received a fair number of glances, while we did

not observe anyone look up at the displays mounted near the ceiling at this site. In another case, projected displays high up in a well-trafficked atrium of a public university building that displayed information about upcoming talks and events attracted almost no glances from passersby, despite being very physically large. During a one-hour observation period, we watched over 100 passersby, and saw only four turn their heads up to look at the content. Only one person actually paused to read the content for more than 1 or 2 seconds.



Figure 1. Large displays positioned well above passersby's heads in a museum and university building attract few glances.

**Brevity of glances:** In nearly all cases, we found that users paid attention only very briefly to the displays, if at all. When people turned their heads to glance at the display, we found that they usually only looked in the direction of the display for one or two seconds. Beyond that, there were extremely few incidents of people slowing down as they passed the displays, and only a few extremely rare occurrences of people actually stopping or changing their walking path to look at the display content. Displays that showed video content tended to capture the eye somewhat longer; although passersby did not frequently stop to watch the video, many did continue to look at the display for a few more seconds as they walked past, following it with their head until they were too far past it to look at it comfortably. Given the general brevity of glancing, we found that there was a incongruity between the intent of the display content and people's actual actions. Many of the displays showed a few sentences of text at a time in the form of product description, a fun fact, a description of a service and a corresponding URL, or a description of an upcoming event. Considering what we observed, it is unlikely that passersby are actually reading the content in its entirety.

**Catching the eye:** One assumption often made about large displays is that they are eye-catching and naturally attract attention. In our observations, however, we found that people were more likely to look at them if there was something else nearby that caught their attention first. For example, a bookstore window display contained a large display with advertisements, some soccer merchandise, and a poster with some photographs of soccer players on it. In all but two instances of glancing at the display, passersby first

stopped to look either at the poster or the merchandise before turning their attention to the display. In another case, a long case facing outwards from a bank had a row of decorative household items, followed by a large display showing advertisements for bank services. We observed approximately 80 passersby and found that nearly all of the people who glanced at the display came from the same direction; they started by looking at the items while walking by and then glanced at the display at the end. We did not notice the reciprocal behavior in the other direction; while people walking in the other direction often looked at the household items, their attention was rarely caught first by the display.

## 6 Implications and Future Work

The findings presented in this work reflect the preliminary analysis of data collected in the early part of a larger field study. They suggest that the ultimate position and context of the display should be taken into account during the design phase rather than after the fact. Additionally the design of the context itself can have substantial impact on how much attention the displays receive, and when possible, it should be considered how the surrounding environment can be designed or taken advantage of to draw attention to the displays, rather than assuming that the displays themselves will attract passersby. Finally, content itself should be carefully designed in such a way that does not assume that people are willing to engage for more than a few seconds before deciding whether they are interested; non-urgent, ambient information should be able to be conveyed at a glance.

We are currently continuing analysis of this data and further site observations including other types of settings and content, such as displays for reference (eg. schedules in train stations and airports) as well as entertainment and artistic content (eg. Nova [4]). To gain further insight on the benefits, difficulties, and intended use of large displays in public settings we are planning interviews with various stakeholders, including proprietors of businesses that have chosen to use such displays, and people responsible for designing and maintaining them. Additionally, we are using the findings of this work to ground further design ideas for how to create more effective large display content and applications for public spaces.

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## References

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