
Social Networked Displays: Integrating Networked Public Displays with Social Media

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Abstract

With significant price drops of large LCD panels public displays are "painting" the urban landscape. Connected over the Internet they constitute a novel communication medium - a network of open public displays. One of the challenges with such a novel communication medium is integrating it with existing user communicative ecology - current information and communication technologies that are already well established and highly used by the general population, e.g., Facebook and Instagram. As one of the most popular activities on these networks is photo sharing a possible solution for integrating networked public displays could be in allowing users to use it as both input and output device for images, i.e., allowing them to a) post situated snapshots onto Facebook through an on-display camera and b) show images on the screens taken through Instagram. In order to replicate what is happening with the images online comments and likes posted about images are also shown on the screen. In this demo we show two applications: 1) Moment Machine - a public display application that allows taking situated snapshots through on-display camera and posting them to Facebook; and 2) Moments Gallery - a public display application that shows images, comments, and likes for photos submitted through Instagram and Facebook.

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UbiComp'13 Adjunct, September 8–12, 2013, Zurich, Switzerland.
ACM 978-1-4503-2215-7/13/09.

<http://dx.doi.org/10.1145/2494091.2494107>



(a)



(b)



(c)

Author Keywords

Public display applications, social media, social network displays

ACM Classification Keywords

H.4.3 [Communications Applications]: Bulletin boards;
H.5.1 [Multimedia Information Systems]; H.5.3 [Group and Organization Interfaces]

Introduction

Public displays are becoming a ubiquitous resource in the urban environment: we can find them at airports showing flight schedules, in bars and cafés displaying events and menus, or on the streets displaying advertisement. Although most of these displays are singular installations it is not hard to imagine that they will soon be networked, thus constituting a novel and powerful communication medium - networked public displays - a communication channel for the 21st century [5].

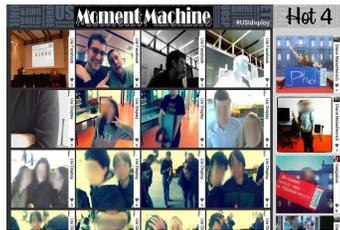
One of the challenges this novel communication medium is facing is its integration/immersion within existing users' communicative ecology [13], i.e., within information and communication technologies that are already well known and used by the general population, e.g., Facebook and Instagram. These services have a big and stable pool of users that use them on a daily basis for photo sharing: in 2012 Business Insider [1] reported that staggering 300 million images are uploaded on Facebook daily! Similarly, Instagram reports that it receives 40 million photos daily [2]. In contrast to Facebook and Instagram public displays are largely ignored by their potential users [8]. While creating content for the two social networking services (SNS) is considered "dirt cheap" creating content for public displays is expensive [16].

A possible solution for integrating networked public displays into users' communicative ecology could be to allow content interchange between the networked public displays and social networking services. In other words, 1) take photos from displays and post them to a social networking service, i.e., to Facebook, and across the display network; and 2) post photos from a social networking service to a display network, i.e., from Instagram. In order to make the networked public displays more social comments and likes posted on the images should also be displayed.

The idea of using user contributed images on public displays is hardly novel. In previous projects researchers used networked public displays to 1) show images from social networking services like Flickr [15], Instagram [14], or custom services created specially for networked displays like InstantPlaces [9]; or 2) they used networked public displays to take images and post them on social networks, e.g., Facebook [7]. None of these projects tried to use networked public displays as both *input and output device for social networking services*. Also none of the previous research tried to show one of the most important properties of the images, i.e., "likes" and comments.

In this demo we will show two applications: 1) *Moment Machine* that allows capturing situated snapshots onto networked public displays and posting them to Facebook and 2) *Moments Gallery* application that shows a) images taken through the display and posted to Facebook and b) images taken through Instagram using a predefined tag. The InstaMoment application also displays comments and likes associated with images posted on Facebook and Instagram.

Figure 1: The Moment Machine 2.0 user interface: (a) live video feed that allows image capture and (b) posting of images to Facebook or a display network



(a)



(b)



(c)

Figure 2: The Moments Gallery user interface: (a) Images taken from the displays and Instagram are mashed together. In addition (b) comments and (c) likes for images from Facebook and Instagram appear on a display network.

Moment Machine and Moments Gallery Applications

Both Moment Machine and Moments Gallery applications have been developed using the WE-BAT application template that allows for easy integration of user-contributed content [6]. The WE-BAT is a web-based client-server architecture based on Java PLAY client-server framework [3] and consists of three main components: 1) hooks to online platforms – in this case Facebook and Instagram – that allow easy collection and publishing of information, 2) application server that automatically pulls information from Facebook and Instagram and stores it the local database, and 3) application client that runs in a web browser and presents content to the viewers.

The early version of the Moment Machine [11] is deployed in London and Nottingham as part of the "Screens in the Wild" project [4] and it supports tethered content upload [10], i.e., content taken through the on-display camera is distributed only across the screen network. Users can change the look and feel of their snapshot by selecting different filters available on the screen (similar to the Instagram application). The 2.0 version of the Moment Machine that will be demoed on the other hand allows optional photo sharing from the display to Facebook, i.e., users can choose if they want to share situated snapshots a) only to a display network or b) to a display network and Facebook (cf. Figure 1). Images that are published on Facebook go to Moment Machine's Facebook page, where each location/display has its own album.

The Moments Gallery application shows images that have been submitted through the display network as well as Instagram images tagged with a predefined tag. For Instagram images and the ones taken through an on-display camera and posted to Facebook, Moments

Gallery fetches and displays user comments and likes (cf. Figure 2). To be more inclusive of the passers-by and content viewers [12] Moments Gallery also allows users to express their opinion about the content through non-personalized "liking" of the images.

The goal of this research is to investigate how networked public displays can be integrated into users' communicative ecology and how they can be used to stimulate community awareness and sense of a community. Previous research [17] shows that images uploaded to a display by community members can indeed support the two. This research extends previous research by allowing community members to express their opinion about the content through likes and comments. In addition Moment Machine 2.0 and Moments Gallery allow users to express to which community they belong to. Both applications support image stamping with a predefined community logo. For example in the context of a university community users can stamp the image with the logo of the faculty they belong to, e.g., Faculty of Informatics, Communications, of Economics.

Conclusions and future work

Public display networks are the communications medium for the 21st century [5]. In order to understand how they can fit within existing communication mediums, e.g., Instagram and Facebook, we have developed two applications – Moment Machine and Moments Gallery. Moment Machine allows easy photo taking through networked public displays via a display attached camera and sharing onto a display network and/or Facebook. Moments Gallery displays images taken through the Moment Machine and Instagram photos tagged with a predefined tag. The Moments Gallery application also shows comments and likes associated with the photos. In

the future we plan to deploy both applications at two community settings and observe how this communication medium is adopted by the community members.

Acknowledgements

The authors acknowledge the financial support of the Future and Emerging Technologies (FET) programme within the 7th Framework Programme for Research of the European Commission, under FET-Open grant number 244011.

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