The Quartier des Spectacles: developing the interactive potential of dynamic digital displays in actual public space

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ABSTRACT

Produced by a non-profit organization, this 7-minute video presents the LUMINOUS PATHWAY, one of several urban planning projects intended to develop the potential of a public space located in the downtown core of Montréal, Québec. This environment of one square-kilometer comprises an infrastructure of eight permanent digital media façades used at night to showcase interactive public art pieces and explore various strategies to enhance public interaction. It is run by the Quartier des Spectacles Partnership (PQDS), an organization that brings together borough stakeholders such as local residents, non-profit organizations, elected representatives, academic researchers, artists, cultural producers, venues and media companies. In the years to come, the PQDS will collaborate with SIAT's Making Culture Lab to conduct empirical studies around these media façades. Using design ethnography and collaborative methodologies, our goal is to generate theory and design principles to harvest the interactive potential of dynamic digital displays in actual public space.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous ; J.5 Arts and humanities: fine arts.

General Terms

Design; Human Factors; Theory.

Keywords

Dynamic digital displays; design ethnography; collaborative methodologies; urban screens, public space technology design.

1. Program of Research

Whether they are used to publicize contextual ads or broadcast news on subway platforms, the majority of dynamic digital displays (DDDs) situated in actual public space currently remain non-interactive; They are mostly used to deliver information. Yet the past decade has seen HCI research labs design a number of interactive digital displays. Often deployed in controlled private or semi-public settings, their designs are rarely grounded in a thorough analysis of how they might be used "in the wild".

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Our lab is concerned with studying and developing the interactive potential of DDDs in their natural settings. Architectural scale dynamic digital displays constitute our object of study because, on the one hand, we are interested in screens large enough to attract and retain people's attention in the built environment, and on the other hand, we are concerned with creating new forms of colocated interaction in publicly accessible urban spaces.

The increasing ubiquitous presence of DDDs in the very fabric of the city is changing the way we experience urban space. With the rise of pervasive computing and mobile HCI, we believe that it is just a matter of time before personal computing devices are routinely networked to DDDs to enhance the blending of physical and virtual worlds as we are currently seeing in the field of augmented reality. Accordingly, in collaboration with PQDS stakeholders, the *Making Culture Lab*'s program of research for the next three years will investigate the different forms that interactivity can take in the space under study shown in Figure 1.

Our research is presently still in the exploratory stages. In 2012-13, we are presenting a number of published theoretical papers proposing analytical frameworks and operational concepts to prepare for our future empirical studies [1][2][3][4].

In the fall of 2013, we will be conducting an evaluation of a crossmodal interactive dynamic digital display to be projected on the media façade identified by a white box at the upper right-hand corner of the blue square border line in Figure 1. The spoken word captured on site with microphones constitutes the input material for an interactive artifact in which sound, vision and proprioception are the senses that come into play. This PQDS and NFB interactive public art project called MEGAPHONE seeks to revive the historical concept of the "Speakers' Corner", a designated area in the city where all citizens could exercise free speech in an open forum.



Figure 1 - Bird's eye view of architectural scale digital displays located within a perimeter of 1 square-kilometer. The white rectangular shapes are some of the permanent media façades. ©2012QuartierdesSpectacles

2. Infrastructure of Site Under Study

The white boxes in Figure 1 show the eight building façades that have been permanently selected for artistic video projections in Montréal's Quartier des Spectacles public space site. This infrastructure operates as a year round digital projections site.

The façades have been digitally mapped in order to precisely define the projection areas. Projected artifacts are designed to carefully integrate each building's architectural elements. As a result, rather than using the façades as blank screens, they are used as textured ones, some of them with unusual shapes. Content is also designed to be site specific, sometimes referencing the history of the building, sometimes its contemporary function.

Content is renewed regularly and two projects – organized by the Quartier des Spectacles Partnership (PQDS) and original content creators are being developed in parallel: the LUMINOUS PATHWAY and the DIGITAL PATHWAY. The former uses architectural lighting as a visual signature to brand the Quartier des Spectacles area, guiding pedestrians to their destinations and informing them of the urban nightlife. The second regularly offers architectural scale interactive artifacts playfully created by local multimedia artists.

Artists have access to 28 projectors (Christie projectors 16K, 18K-HD, 20K+S, S+20K-J, S+22K-J) managed by the powerful Photon software by Montreal-based VYV. Thanks to this equipment, the artists can focus all their energy on content creation and R&D in the digital arts. The Quartier des Spectacles public space site has become a one-square kilometer canvas for them to showcase their talent to local and international audiences. Given its mandate to create interactive experiences in public space, it is also an open laboratory for experimentation and exploration for HCI research and public space technology design.

This technological park was built to be operational 365 days a year. It is equipped with remote control tools and automatized systems to ensure the dynamic digital displays run in a smooth and ongoing manner. Each projection site is equipped with its own servers, camera systems, temperature probes, HVAC systems, remote control projectors, automated email alerts and tools to manage content online. All of these are linked to a master control.

Figure 2 shows this master control center identified by the French word "régie". The overlaid diagram illustrates the peripheral equipment remotely monitored and controlled from this center. These include servers, the projectors, the heating and cooling systems, the surveillance cameras and pre-programmed events.



Figure 2 – Overhead view of a small portion of the public space under study (marked by blue square border lines in Figure 1) with overlaid diagram of remote control operations. ©2012QuartierdesSpectacles / Photo: Stéphane Poulin.



Figure 3 – Basic model for end user interactivity currently used for the eight media façades illustrated in Figure 1. ©2012QuartierdesSpectacles / Image: Mikaël Charpin.

As this permanent infrastructure is still fairly new, the interactive potential of the digital media façades in this public space is yet to be fully harvested. Figure 3 shows the basic model currently used to develop DDDs and interactive artifacts. The yellow surfaces represent the surfaces targeted by videoprojections. From street level, end users can interact with the DDDs through their smartphones or other interactive devices made available on the site itself. Depending on the technical requirements of the particular deployment scenario, interactivity is possible directly with the video servers either through a wire connection (fiber-optic or network cable, etc.) or a wireless network (3G/4G, WiFi, etc.). These servers, projectors and surveillance cameras are installed on a rooftop in weather proof casings as seen in Figures 4 and 5. Currently, there are a total of 28 video projectors in operation for eight DDDs media façades on the entire site.



Figure 4 and Figure 5 - Photos of equipment permanently installed on rooftops in special weather proof casings. ©2011QuartierdesSpectacles / Photos: Mikaël Charpin.

3. ACKNOWLEDGMENTS

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