

De-light-ful Cities

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ABSTRACT

Urban lighting and urban display systems shape the image of cities at night. However, they are strictly separate realms of urban design and technology development. Even though many cities regulate the use of large-scale digital displays in public spaces cities are becoming increasingly illuminated. What interaction design and urban design opportunities arise if we eliminate the distinction between urban lighting and display technology? On the one hand, programmable pixels would enable ad-hoc reshaping of urban form throughout the evening because light outlines the image of the city at night. On the other hand, responsive systems would facilitate interactions among urban residents. Together reshaping urban form and enhancing interactions could increase the de-light-ful character of cities at night without increasing overall light levels.

INTRODUCTION

At night our eyes depend on artificial light sources to navigate any environment including urban spaces. These artificial light sources can be mobile or fixed, personal or public. In some cases, lights are specifically intended to illuminate the public way; in other cases, lighting is simply a by-product of other uses such as accent lighting and advertisements. Organizations such as the International Dark Sky Association [4] are fighting to reign in these wasteful applications. Distinguishing between wasteful and necessary uses, however, is a complex matter. And in fact, it could preclude many creative and de-light-ful applications that would enhance public spaces at night. What interaction design and urban design opportunities arise if we eliminate the distinction between urban lighting and display technology?

URBAN LIGHTING

Very roughly urban spaces are illuminated at night for two reasons: safety and effect. Both uses have a long history. The first street lights in ancient cities burned olive oil [6].

The first public effect lighting with fireworks or short-lived candles were orchestrated for the pleasure of the upper classes [2]. The interchangeability of these two systems emerged by accident much later with the advent of widespread street lighting systems and early display technology. For example, the Great White Way on Broadway in New York city lacked streetlights. This fact was discovered when the theaters declined and turned off their flashing billboards. Suddenly, the streets were dark and perceived as unsafe. Today of course Times Square is one of the most brightly lit urban spaces in the world as a result of the many digital display surfaces. [5]

Trends in Lighting Design

Recently, lighting designers have been calling for more calibrated plans that take all sources of light into account over the course of an entire evening. Most urban environments are too brightly lit by a mix of street lighting, accent lighting, shop windows, urban furniture, and signage. And city governments spend a great deal of money on lighting improvements because of the comparatively lower cost and the potentially significant impact. [5]

New Technologies for Display and Light

In addition to refining the mix of light available on city streets there is an opportunity to design new technologies. Urban Pixels demonstrate a hybrid technology that spans lighting and display. Each pixel corresponds to an autonomous and addressable unit that is outfitted with solar cells, batteries and wireless capability. The units can be deployed on any surface and programmed to display varying content depending on their context. [7]

OPPORTUNITIES FOR DESIGN AND INTERACTION

New lighting design approaches and new technologies create opportunities for urban design and enhancing interactions in public spaces at night.

Defining Urban Form through Light

At night we can only see those parts of the city which are illuminated. With the help of a well-designed lighting system even the most bland building can be transformed into a spectacular gem. Lighting festivals such as the Lyon Fete des lumières [3] have exploited the sensational aspects of form giving through light. However, the every-night landscape could also be enhanced by coordinating the definition of urban spaces through light. For example,

certain plazas are centers of activity at night and lighting features should reflect the importance of these centers. In other words, the definition of urban form should be connected with the movements of people in cities at night. More responsive and openly programmable systems are needed to enable these types of interventions.

Enhanced Interactions

The previous section addressed the impact of lighting on a broader urban scale. Many small-scale interactions could also be supported through sensing-enabled lighting. Imagine the following scenario with two possible endings: You are riding a bicycle in a designated lane on an urban road at night. A flashing LED light mounted on your handlebar signals your presence on the roadway. In the dim glow of a sodium-vapor streetlight you see a pedestrian chatting happily to a friend on her cell phone. She suddenly turns 90 degrees and steps into the street. (...)

Ending 1: You start ringing your signal bell, but she does not react. You slam on the brakes...

Ending 2: A streetlight overhead has been sensing activity below and projects a red STOP sign on the street in front of the unsuspecting pedestrian. She stops dead in her tracks and you whiz by her...

This simple scenario seems banal, but it offers a new way of thinking about urban lighting at night which could redefine citizens' relationship with the urban environment. Brandi says it very elegantly, she aims to “plac(e) urban light in a special relationship to the protagonist and the spaces surrounding him” [2]. Most of us cannot remember the city before electric light, but it has not changed significantly in our lifetimes. Increasing the types of interactions facilitated through light offers an exciting space for experimentation.

IMPLICATIONS FOR THE PUBLIC REALM

The subtle weaving together of lighting for necessary applications and lighting for effect raises many issues about the ownership, management and operation of the virtual and physical public realm. Usually a public body or public-private authority manages urban lighting systems while display surfaces are privately owned. These public/private distinctions have become blurred in many cities. [1] Advertising companies such as ClearChannel and Decaux are now providing urban furniture in exchange for exclusive advertising rights. Integrating display and lightings systems would further erase the public-private distinction.

Hybrid display and lighting systems would also require a more sophisticated interface for programming and managing lighting in cities. Replacing existing systems seems unreasonable given the lifespan of lighting units and the budget constraints of cities. Instead, I can imagine a patchwork of lighting technologies that would support the ideas suggested above. And these systems could be

implemented through public and private channels.¹

CONCLUSION

Urban lighting design is dominated by highly specialized experts. And yet there are so many opportunities for interdisciplinary explorations between interaction designers, ubiquitous computing experts, urban designers and lighting experts that could still be explored. And more importantly these visions should start to be tested in real environments to ascertain which directions are the most promising to make our cities more de-light-ful – not just as a fanciful addition to public space, but as a model for future interventions.

BIOGRAPHY

Susanne is a PhD student in Prof. William J. Mitchell's Smart Cities group at the MIT Media Lab where she also completed her Masters in 2005. She is interested in the benefits of thinking holistically about urban development and new technologies. Her current research focuses on urban public spaces and lighting systems. She is developing a system called Urban Pixels. Susanne's background is in urban planning (Master in City Planning from MIT) and architecture. Born in Vienna, Susanne grew up in the United States, Australia and Austria. She is fluent in German, English and French – and just enough Italian to get into trouble.

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¹ Issues such as privacy protection and surveillance are vital in this context, but they exceed the scope of this paper.