Interaction with Media Façades

Over the last years, urban environments and public places have emerged as prime locations for deploying digital technologies, which increasingly affect daily life [16]. For example, they optimize heating systems in buildings, balance the flow of electricity through the power grid, and keep autonomous public transportation networks moving [16]. Hence, urban environments are on their way to being turned into dynamic and programmable surfaces [11].

The notion of Smart Cities has increasingly enjoyed popularity over the last decade. There are enormous efforts by the European Union, governments, and cities to make them smart in different domains by utilizing information technologies (IT). Some parts of this technology are visible, for example when long-serving artifacts such as analog billboards for advertising are replaced by digital displays. The computer chip manufacturer Intel\(^1\) estimated in a recent case study on digital signage that the number of digital public displays will reach 22 million screens worldwide by the year 2015\(^2\). As a consequence one of the main goals when planning and building urban environments is to achieve a situation where the residents identify with it [14]. Architectural principles state that an effective way of achieving identification is to focus in the design process on the communication between people and buildings [17].

Besides large-scale digital displays, an increasing number of media façades are embedded into the urban landscape (Fig. 1), becoming more and more ubiquitous. In a common sense, the term media façade describes the idea of turning the façade of a building into a very large public screen by equipping its outer shell with interactive, light-emitting elements [12, 14]. However, to date, there has been no clear definition that sufficiently delimits media façades from urban media architecture and large-scale digital displays, which are embedded into the urban environment. In this case the display appears as a second skin of the building.

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\(^1\) http://www.intel.com

Abstract

Media façades are a prominent example of the digital augmentation of urban spaces. They denote the concept of turning the surface of a building into a large-scale urban screen. Because of their enormous size, they require interaction at a distance and they have a high level of visibility. Additionally, they are situated in a highly dynamic urban environment with rapidly changing conditions, which results in settings which are neither comparable, nor reproducible. Altogether, this makes the development of interactive media façade installations a challenging task.

Media façades can be classified based on different characteristics and properties. Among others, these might include their technical composition, as well as the main principles of how content can be displayed. Along with media façades, the manifold use of light and light-emitting elements in general plays a more and more important role in the architecture of urban environments. In this sense, we have to note the differences between lighting architecture, media architecture, and media façades. Häusler [12] distinguishes these terms as follows: Lighting architecture subsumes the illumination of a building using daylight and artificial light in order to underline parts of the building to create a certain atmosphere. This also holds for media architecture, whereas media architecture also includes all aspects of dynamically displaying media, such as dynamic graphics, dynamic text and spatial movement, but with a strong focus on dynamic content. Media façades build on this by including media to transform the building façade into a communicative element. The transition between lighting architecture, media architecture, and media façades can be seamless. While media façades enable communication via technologies on a façade in the form of digital media, media architecture describes the cultural, social, and economic implications of these façades for the immediate environment [12]. The aforementioned notions of media façades are created from a rather architectural perspective. When dealing with media façades as large-scale digital screens from a human–computer interaction perspective, we can define the term media façade as follows: Media façades are digital public screens with arbitrary form factors and of arbitrary resolution, which are created by either equipping the outer surface of an architectural building with controllable, uniformly shaped, light-emitting elements or by projecting digital content onto it. They are embedded into the architectural structure of a building.

Media façades are associated with a typical set of characteristics, which lead to various challenges that have to be faced when developing interactive installations for them: in contrast to situated public displays, they are usually very large in size. The size of a media façade can vary from the very small with perhaps 50 m² like the Academy of Fine Arts’ Saar in Saarbrücken, Germany, to medium-sized ones, such as the ARS Electronica Center in Linz, Austria, with 5000 m², or very large ones, such as the Allianz Arena in Munich, Germany, with a total surface area of 25,500 m². As a result of their enormous size, media façades can be visible from great distances. This leads to wide exposure of the content displayed on the façade. In most cases, media façades also cover more than one side of a building’s façade, and in some cases even the roof of a building. This gives them a three-dimensional (3D), nonplanar form factor. A further very important aspect is their technical specification: media façades are usually individually designed and unique creations. Since media façades are created using a wide range of industrial components, they usually differ strongly in their technical configuration and therefore, in how to access and control them. Furthermore, they also provide various screen resolutions and hence, their capability of displaying a particular content.

In their ability to display highly dynamic, digital media content, media façades might be comparable to situated public displays. Conversely, because of their size and unlike situated public displays, media façades require a certain viewing distance to view and perceive the displayed content. Situated public displays are a great source of interactivity. People can interact with the display in various ways and for different purposes, like for example browsing information, exchanging content, or simply for pleasure stimulation. Media façades represent a potential gateway between the personal and the public domain.

3 http://www.hbksaar.de
4 http://www.aec.at
5 http://www.allianz-arena.de