

# Media Façades in the Wild: Some Lessons

Hai-Ning Liang, Xiaowei Dai, Nancy Diniz, Charles Fleming, Woon Kian Chong

**Abstract**—Media displays in public areas are becoming increasingly pervasive—they are used in many settings, come in different sizes, serve different purposes, and have varied degrees of interactivity. In this paper, we aim to provide a survey of how these displays, often named media façades, are used in the wild in a city in China which is undergoing a rapid growth. This survey is intended to raise greater awareness and discussion about the use and effect of these displays in public areas. Through this survey, we have been able to distill some lessons of what is good, bad, and ugly about some current examples of media displays used in a city that is transitioning into becoming a modern one and one that is located in one of the fastest growing areas in Asia. With this research, we hope that we can provide technology designers and architects with some general principles that can help them integrate these types of technologies into their architectural creations.

**Keywords**—Large displays, media façades, interaction design, architectural displays.

## I. INTRODUCTION

TWO developments are having a profound effect in our cities: One is the construction of a growing number of buildings whose designs and façades are becoming increasingly complex and intricate, while the other is the use and *attempt* to integrate media displays in these buildings. As argued by Diniz et al. [7], architecture should and could be coupled with human and societal demand for media and technology in transforming design and construction of built environments. Our working assumption is that these two processes will be further interlinked and that one will, and should, help shape the other. However, today's development has not reached that level and it actually seems quite haphazard, with the displays being an afterthought rather than being an integral part of an architectural creation from its inception.

We are witnessing the convergence of architects, urban designers, and computing engineers in exploring surface materials, surface treatments, input sensors, and all types of digital circuitry in many experiments and prototypes, developing full-scale systems that can be part of the architectural façades of many buildings [1]-[6], [8], [15]. The attempt of trying to integrate these façades onto building and

other architectural constructions is gathering pace and we see this in many modern cities. Very few places is this more evident than in fast growing cities in China, where the push to modernize the cities to make them attractive to investors and skilled people is ever increasing. This process takes different shapes and expressions, one of which is to develop buildings and public spaces that are able to provide an ambience of modernity. It is as if city planners assume that by adding a touch of technology to buildings and public places, it is possible to create this feeling of modernity that is appreciated. One type of technology that is used widely is media displays or media façades. Questions however still remain about their effectiveness and their effect on the areas they are located as well as how we can generate greater engagement [9].

Research on the use and effect of media façades appears to be lagging behind as we are witnessing a rapid adoption of these technologies in many settings. It is not certain what the effect of tying up these displays to buildings is. Giving the important role these displays play, researchers from architecture, urban planning, and computer science / engineering have now started to investigate their usage [1]-[6], [8]. The research presented in this paper is in support of this trend, and aims to make a contribution to our understanding of media displays. Given that there are many examples out in the wild, our approach is to examine some of them and see whether there are patterns as to what make them appreciated by its intended audience—that is, the people walking by or near them. This approach is used by other research with positive effects [15].

In contrast to other researchers (see [7], [15] for example) we focus our attention to different media façades within one city rather than across cities and countries. Based on our observations and interviews with people, we have been able to collect a set of broad guidelines which can help to make these displays attain its goals and in particular being valued and liked by people.

## II. SUZHOU: A CASE STUDY FOR THE DEVELOPMENT OF MEDIA FAÇADES

In this section, we present our case for choosing the site of our research. In addition, we present the main bulk of this paper which is about the selected examples of these media displays and the lessons we distill from analyzing them.

### A. Suzhou: A City Combining the Old and New

Suzhou is a mid-size, fast growing city with long historical value to China. In contrast to many other cities in China and elsewhere, Suzhou is an old city but is undergoing a dramatic transformation in its building landscape. It faces the challenge of keeping the old while moving forward to become a modern city on par with its neighbor, Shanghai. Suzhou has two main

H.-N. Liang is with the Department of Computer Science and Software Engineering, Xi'an Jiaotong-Liverpool University, Suzhou, China. (Corresponding author; phone: +86 512 8816 1516; fax: +86 8816 0442e-mail: haining.liang@xjtlu.edu.cn).

X. Dai and C. Fleming are with the Department of Computer Science and Software Engineering, Xi'an Jiaotong-Liverpool University, Suzhou, China (e-mail: Xiaowei.Dai12@student.xjtlu.edu.cn, charles.fleming@xjtlu.edu.cn).

N. Diniz is with the Department of Architecture, Xi'an Jiaotong-Liverpool University, Suzhou, China (e-mail: nancy.diniz@xjtlu.edu.cn).

W. K. Chong is with the International Business School Suzhou, Xi'an Jiaotong-Liverpool University, Suzhou, China (e-mail: woonkian.chong@xjtlu.edu.cn).

areas. One is old town and the site of its ancient city. Surrounding the old town are the new development zones, one of which is the Suzhou Industrial Park (SIP). SIP is well-connected via nearby airports to cities such as Hong Kong, Seoul, Tokyo, and Taipei, and via high-speed rail to other major cities in China. SIP is a major growth zone, including operations run by nearly one-fifth of the Fortune 500 top global companies. Greater Suzhou is now the fourth largest concentration of economic activity in China in terms of GDP (\$195 billion in 2012). The broader Suzhou area encompasses the spirit of both old and new in China, with the historic old town's canals, UNESCO World Heritage Site gardens, and the I.M Pei-designed Suzhou Museum attracting millions of tourists annually. SIP offers an excellent quality of life with high environmental standards in par with other modern cities within China and outside. The nearby lakes, Jinji Lake and Dushu Lake, provide attractive views, by day and by night, and there are a variety of shopping facilities, international and local restaurants, entertainment hubs and a great nightlife.



Fig. 1 The two sides of Suzhou: the old and new. The ancient town (represented by the square in the center of the lower picture) of the city of Suzhou is renowned for its beautiful canals, traditional houses, and gardens. The new Suzhou is an example of the fast industrialization of China where many cities are competing with one another to attract investments and skilled people to live there and help to improve their economies and living standards. One main factor of the new zones in Suzhou that is quite attractive is the presence of many lakes

As Suzhou is transforming itself into a modern city, it is seeking to be a pioneer in the use of media displays in its buildings and other public structures. The city is therefore a good example to look at when analyzing the integration of media façades into the architectural structures within the old city and the new development zones, where there are some very unique creations. We next look at some of these

examples.

### B. The Skype Canopy, Times Square

The Sky Canopy in the Harmony-Times Square development area (see Figs. 2-4) is a large scale media façade. It represents an unconventional use of media displays, blending the aesthetics and technology into a lighted fabric city landmark. It is one of the largest, if not the largest, media displays of its kind anywhere. It attempts to enhance the shopping space and experience with multimedia projection surfaces that connect the buildings (mostly retail shops) along a water canal.



Fig. 2 An aerial view of the Sky Canopy in the evening, showing in full the scale of its impressive structure and the range of colors it can show



Fig. 3 The Sky Canopy seeing from one side. Its curvature resembles the contour of a river or water canal, like the one it is located next. It is supposed to be a major tourist attraction, with people going to that area for food, shopping, and to simply stroll around. The reality, however, is that it is falling short of expectations

The projection surface is supported by air cushions together with a glass fiber structure that build up a large LED display screen (<http://specialtyfabricsreview.com>). The screen is almost 500 meters long. In terms of attraction, the Canopy is meant to be a symbol of the development of Suzhou. However, the reality is different as it does not seem to play an important role in attracting local people and tourists to the shopping area; there are not that many visitors to the canopy. In terms of technology, the canopy represents a huge developmental step in media displays. It is quite impressive the view it gives, both from above and below. Despite this, it

has some limitations. For example, the image definition and quality is not that high, limiting its use. In addition, it is not ergonomic, given that it is directly above people and to view its images people are forced to look up, and this can potentially create stress on people's necks. The biggest limitation is however in its display content. The Canopy only shows content that is very simple and in people's opinion meaningless, with the display being on during a narrow time in the evening, from 8:00 to 8:30 (see Fig. 4 below).



Fig. 3 This picture is taken below the Sky Canopy and shows the display when it is on. Its scale and range of color is meant to impress those walking by. However, people find that its content monotonous

When asked about their feelings about the canopy, people commented that it is impressive and are awed by its design and structure. However, they have also said that are somewhat disappointed that the canopy is so underused—that (1) it displays only very simple and often meaningless, non-engaging content, and (2) it is only operational for a very brief time. In other words, the novelty wanes quickly and the whole structure is seen often as a lifeless and dull piece of concrete and metal.

#### C. Suzhou Science and Cultural Arts Center

The Suzhou Science and Cultural Arts Centre's façade (Fig. 5) developed by studio 505 meets requirements of large scale architectural spaces. The main building has a continuously curved large perimeter (1.5km long) with an inner weatherproofing layer with both glazed and opaque areas, covered by an outer ornamental metal screen. The glazed areas allow for variations of color and shapes.

The building is designed by Paul Andreu, and it is inspired by the Suzhou classical gardens, considered to be important expressions of Chinese architecture, pearls, lake waves, and the ancient protecting walls of old town of Suzhou. Situated next to a lake, the architect uses some new technology and LED lights on the cover, combining the traditional culture and modern technology.

Visitors' comments about the design of the center are largely positive. They like its design and the fact that is not so flashy, or bothersome to look at, but quite pleasant to their eyes. In addition, they commented that it blends quite well with the surroundings, as it is situated next to the lake, but it does not competing with it. In other words, the designers have

attained a balance between the modern look of the building yet it feels that it belongs to the geographic location in a very natural way.

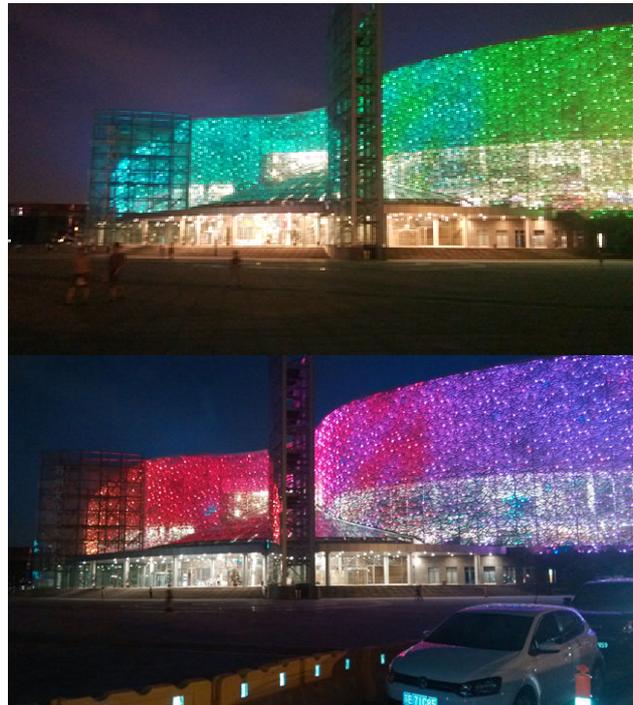


Fig. 5 Two pictures of the Suzhou Science and Cultural Arts Center showing how the LED lights embedded on its outer walls change colors, giving life to the whole area. Although having a large number of lights, people do not feel bother by them. They find that the intensity and varied color changes of the lights make the building pleasant to look at

#### D. The Moonlight Harbor Tower

Located near one of the main lakes in Suzhou, Moonlight Harbor is one of the most beautiful spots in the city (see Fig. 6). The tower is situated just on an outside corner of a village of shops and restaurants. It stands at more than 2.5 meters high and has four walls made up of bright display screens. Its design is supposed to attract the attention of people from a distance. In despite of its impressive high and luminous screens, it falls short of its intended goals because of its location and design. On the one hand, the place where it is located is almost near the edge of the village and behind a tall building. Seldom people would pass by it. In addition, because of its design and angle of view, even when people get close to it, they would not notice the displays and their content. On the other hand, the displays are simply used to broadcast propagandas for the government which many people find uninteresting. When people are asked their feelings about the content, most say that they find it quite boring and even dull and barely pay attention to it.



Fig. 6 Two pictures of the Moonlight Harbor Tower. These two pictures are taken from different angles showing how it stands out from its surrounding buildings and at the same time how it is hidden behind others. People often complain about how bright the displays are and how difficult and unpleasant it is to look at

#### *E. Displays around the City*

There is a proliferation of large displays in many public places around the city. We have also examined them to get a sense of how well they do, and have conducted some informal interviews to those passing by to see what their feelings and perceptions of the displays are.

Figs. 7-9 are all examples of media displays around the city of Suzhou, particularly in the old town. The display in Fig. 7 for example is just located outside of gate to the old city, and it uses the old Chinese architecture style in its borders. This display serves a dual purpose: To welcome people into the old city and also to promote certain commercial products. Some passerby, when asked about how they feel about the display, they said that it is not useful and they never pay attention to it. In addition, they say that it is better to be focus on one particular thing. That is, to make it either as a tool to welcome people or to sell products, but not both. They do not like the fact that it is used to advertise products, given that it is situated at the entrance of the ancient city, something which reverberates with pride with the dwellers of the old town.

The display in Fig. 8 is placed on a new building located inside the old town. This new building replaced an old-styled house, similar to the ones shown in the background of the picture. The planners have intended the building to reflect the modern branded shops that it now houses, including Mark Spencer and Gucci. The display, located well above the ground, is barely noticed by people walking on that street. In addition, people have complained that the building and the display do not fit into the environment of area. They have commented that it is better to relocate such a building and its accompanied display to an area outside of the old town, and that they would rather see the old house back. As can be seen from the picture, people walking would barely lift their heads to watch the display. When asked why, they said it is very

high. They also suggested that they would not mind the display as long as it is located at a lower height, because the street is narrow and as such they could not see its content without lifting their neck to an uncomfortable position.



Fig. 7 A large display located at the entrance of the old city of Suzhou. People have mixed feelings about this display which is situated in such a prominent place in the city



Fig. 8 A large display located on top of a new building next to old ones inside the ancient town. The display is often ignored by people walking by as it is not easy for them to look at and people feel that it does not belong to this area amongst other old, traditional buildings

The next figure (Fig. 9) shows another type of display often found now in the old town. This one in particular is actually located in the main tourist street of the old city and next to a beautiful water canal. The display is mainly used for display some messages from the city and other government institutions. When asked about what their thoughts are about this display, people commented that it is not in a good location because it interrupts the follow of people walking; the street is mainly for people to walk around and no cars are allowed to go in. The second aspect they commented is that it is used to communicate things that they do not find useful or interesting. They have said that there are too many displays already around that area displaying the same messages and are tired of seeing them everywhere. Because of such saturation, they have learned to ignore any content from the displays.



Fig. 9 This display is located in the middle of a popular street in the ancient town. It is not very appreciated by people because they have to walk around it and also because it does not display any information that is useful or interesting to them

#### F. Lessons Learned

From these examples, it is possible to distill some general guidelines and principles for how to design and make the media displays to best take advantage of their properties and also in making them more appreciated by people. Below are some lessons we can gather from these examples.

*Novelty is not enough.* As we can infer from the Sky Canopy (Figs. 2-4), novelty is good but not enough. Its effects can wane down quite quickly and fade away if there is nothing else for people to appreciate, especially in terms of innovative content. Although people feel awed by its colossal and quite impressive structure, this feeling can die down rapidly. An important element of these types of creations is for them to keep people awed but perhaps also trying to emphasizing their small details. One thing the designers can do, for example, is to create content that motivates people to follow the display and walk from one end to the other and in process letting them appreciate its intricate technological details. By doing so, it is possible to highlight some subtle components that at first can be missed or overlooked easily.

*Lack of interactivity.* Another lesson that we can take from this survey is that most public displays are non-interactive, non-responsive to people or any contextual changes. It is not easy to provide interactivity to these displays, and this is a topic of intensive research at the moment [2], [3], [7], [12], [13]. However, if there is some interactivity, albeit small, that can be added to these displays, it will make them much more accepting and appealing to people, and certainly much more interesting. For example, Fig.10 below shows a wall display made up of small screens, and when people are closed to them they flash, and it is claimed that this can bring out an element of curiosity from people passing by [11]. These displays are often referred to as *context sensitive* by [5], and are a good way to entire greater interest from people. As the picture shows, people pay attention to it and some even stop to explore further its message. It may not be practical to add interactivity to many of these media displays, especially when they are very large. Nevertheless, if designers are looking to have them to be more effective in getting people to attend to them and appreciate them, adding interactive will likely be a

positive step.



Fig. 10 A wall display made up of small screens which react when there movement. This interactive feature, though very simple, is quite attractive to people, many of whom stop to pay closer attention to its message

*Unsuitable or uninteresting content.* One of most negative aspects about the displays that people complain deals with the content of the displays. Content is one of most important characteristics of media architecture [15]. This is also expressed by the people with whom we have spoken. They often complain about the message in these displays. People have many things to attend to and would not want to waste their time and energy on something that they find uninteresting. Some of the examples given above prove this point.

*Saturation may not be a good idea.* Another factor that may help improve their appreciation is the idea of not saturating people with too many displays at once. People tend to be selective as to what they would like to attend, and may choose to ignore things if they do not have the cognitive capacity to attend to them (as for example when they need to switch from one display to another [14]). Information saturation can have a negative effect and it is perhaps best avoided.

*Lack of purpose.* Many people find some displays lacking purpose and in some cases make life difficult. For example, the display in Fig. 9 adds little value to ambience of the area it is located. Some stated that the display should not be even there. Media installations should have a meaning, and more importantly people seeing it should find that it has some meaning or some purpose.

*People-Centeredness.* In the context of computer systems, it is well accepted that they should be designed to fit people's needs and not the other way around. In the same way, media displays should be designed based on their audience and in relation to the environment they are located. For example, the display in Fig. 8 is simply not suitable for the environment and the people walking close to it—that is, its intended audience. The street is very narrow and with the display located so high above the street, it is quite challenging for people to see it and to appreciate its content. Similarly, the display in Fig. 6 is too bright for many people to look at, and they would rather prefer the display to be turned off so that we can appreciate other elements within the environment.

*Make the displays invisible and part of the environment.* In the context of indoor public displays, it is claimed that for these to be useful, they need to be integrated into the lives of the people in that community [10]. From our observations and talking with people, it appears that the best displays are also those which fit seamlessly into the environment they are located and, more importantly, they are perceived as part of it, neither attracting too much attention nor being too passive. For example, the Suzhou Science and Cultural Arts Center building, besides being beautiful architecturally, is a nice addition and complements nicely its surrounding lake view and the other geographical features. In addition, people have suggested that it feels pleasant when they look at the combination of lights coming out from it, and in particular the whole structure does not compete with other surrounding elements. Oftentimes designers are looking to make their creations stand out but in the process they can inadvertently make them look too unnatural. As with many technological creations, the best designs can be those that make them invisible and this can also apply to public media displays.

*Lack of care after installation.* Another factor that affects the quality of media displays is the lack of care after they have been installed. Because these displays are normally situated outdoors they are at the mercy of weather and other environmental conditions. It is often necessary to consider the care that these display need after its installation. For example, one obvious defect people see in the Sky Canopy is that some portions are often not working and they complain about it because it destroy the feeling of awe and fascination with it. Another example is the display shown in Fig. 11, which shows an error message and nothing more. The display actually is quite attractive, fits nicely into its surroundings, and is located in a good location. However, the message tells a not-so-positive picture about the aftercare that the creators put into it.



Fig. 11 A media display located in a prominent area frequented by many tourists. The only thing people can see is the error message

### III. CONCLUSION

In this paper, we have examined some examples of how media displays, or media façades, are used in public areas. We have look at examples of these installations in a fast growing city in China. The choice of this city is due to its unique features, one of which is that a modern city developed around

an ancient city. This feature poses many challenges to designers who would like to include media façades into their architectural designs. In this paper, we want to take a first step in assisting designers to develop a more integrative view of these technologies when considering using them into their designs. The approach taken in this work is to look at the use of these displays in the wild and in the process extract lessons from them to see the bad, the ugly, and the good of these current examples. So, in this paper, after examining a number of examples, we have been able to distill several lessons that designers can use to help them frame their designs.

In the future, we would like to examine more closely how these displays can be made more useful and functional so that they meet the requirements of designers and at the same time be appreciated by people walking near them. To this, we need to work closely with urban planners, architects, engineers, and computers scientists.

### ACKNOWLEDGMENT

This research is partially funded by Research Development Fund (grants RDF11-02-06; RDF-13-02-21) and a Summer Undergraduate Research Fellowship grant, all awarded by Xi'an Jiaotong-Liverpool University to the first author. We would also like to thank the reviewers for their helpful comments and suggestions.

### REFERENCES

- [1] Alt, F., Schneegaß, S., Schmidt, A., Müller, J. and Memarovic, N. (2012). *How to evaluate public displays*. In *Proceedings of the 2012 International Symposium on Pervasive Displays*. ACM.
- [2] Boring, S., Gehring, S., Wiethoff, A., Blöckner, A.M., Schöning, J. and Butz, A. (2011). Multi-user interaction on media façades through live video on mobile devices. In *Proceedings of the 2011 Annual conference on Human Factors in Computing Systems*. ACM.
- [3] Brignull, H. and Rogers, Y. (2003). Enticing people to interact with large public displays in public spaces. In *Proceedings of the IFIP Conference on Human-Computer Interaction (INTERACT'03)*. Springer.
- [4] Brynskov, M., Dalsgaard, P., Ebsen, T., Fritsch, J. and Halskov, K. (2009). Staging Urban Interactions with Media Façades. In *Proceedings of INTERACT 2009*. Springer.
- [5] Daiber, F., Krüger, A., Schöning, J. and Müller, J. (2012). Context-sensitive display environments. *Ubiquitous Display Environments*, 31-51. Springer.
- [6] Dalsgaard, P. and Halskov, K. (2010). Designing Urban Media Façades: cases and challenges. In *Proceedings of the 2010 Conference on Human Factors in Computing Systems*. ACM.
- [7] Diniz, N.V., Duarte, C. A. and Guimarães, N. M. Mapping Interaction onto Media Façades. In *Proceedings of the International Symposium on Pervasive Displays (PerDis'12)* (Porto, Portugal, 4-5 June, 2012). ACM.
- [8] Huang, E. M., Koster, A., and Borchers, J. (2008). Overcoming assumptions and uncovering practices: When does the public really look at public displays? In *Proc. of Pervasive '08*, 228-243. Springer.
- [9] Memarovic, N., Langheinrich, M., Alt, F., Elhart, I., Hosio, S. and Rubegni, E. (2012). Using Public Displays to Stimulate Passive Engagement, Active Engagement, and Discovery in Public Spaces. In *Proceedings of the Media Architecture Biennale (MEB '12)* (Aarhus, Denmark, November 15-17, 2012). ACM.
- [10] Mencarini, E., Giusti, L., and Zancanaro, M. (2012). An Investigation on Acceptance and Rejection of Public Displays in a Knowledge Company. In *Proceedings of the International Symposium on Pervasive Displays (PerDis'12)* (Porto, Portugal, 4-5 June, 2012). ACM.
- [11] Müller, J., Alt, F., Michelis, D. and Schmidt A. (2010). Requirements and design space for interactive public displays. In *Proceedings of the international conference on Multimedia (MM '10)*. New York, NY, USA, 1285-1294. ACM.

- [12] Müller, J., Walter, R., Bailly, G., Nischt, M. and Alt, F. (2012). Looking Glass: A Field Study on Noticing Interactivity of a Shop Window. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI '12)* (Austin, Texas, USA, May 5–10, 2012). ACM.
- [13] Ojala, T., Kukka, H., Lindén, T., Heikkinen, T., Jurmu, M., Hosio, S., and Kruger, F. (2010). Ubi-hotspot 1.0: Large-scale long-term deployment of interactive public displays in a city center. In *Proc. of ICIW'10*, 285–294. IEEE.
- [14] Rashid, U., Nacenta, M.A., and Quigley, A. (2012). Factors Influencing Visual Attention Switch in Multi-Display User Interfaces: A Survey. In *Proceedings of the International Symposium on Pervasive Displays (PerDis'12)* (Porto, Portugal, 4-5 June, 2012). ACM.
- [15] VandeMoere, A. and Wouters, N. (2012). The role of context in media architecture. In *Proceedings of the International Symposium on Pervasive Displays (PerDis'12)* (Porto, Portugal, 4-5 June, 2012). ACM.