AUGMENTED SPACES, A LOOK BEYOND ADVERTISING

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Abstract. From billboards to urban screens and now to media facades, the augmentation of our cities has expanded, changing social behaviours and public space consumption. Smart buildings are being developed and, much like the smartphones, these hybrids are not only in sci-fi movies anymore. One of the main promoters of media facades and media architecture has been the advertising industry. But artists and designers showed the potential of different approaches, experimenting with digitally augmented spaces both indoors and outdoors. Going beyond the commercial aspect of being an advertising and branding tool, these hybrids offer a variety of uses. Questions of how and where we use them and how they can improve our life quality are discussed here emphasizing that we developed a media behaviour, adjusting our relation to the physical and information environments. I examine some of the most notable experiments outside of the advertising sphere, offering a base for future development of augmented spaces and opening the discussion over the language of new media architecture.

Key words: new media, hybrid spaces, media architecture.

1. The augmentation of space

The term *Augmented Space* was first coined by Lev Manovich in 2002 defining it as "the physical space overlaid with dynamically changing information. This information is likely to be in multimedia form and it is often localized for each user" (Manovich, 2006a).

The augmentation as we know it today represents a paradigm change from the virtual reality of the 1990s; we are no longer emerging ourselves in a virtual environment facilitated by the use of special equipment travelling through space while physically confined to a small area (if not pinned in a fixed location), instead we embedded the virtual in our physical world, we took it outside the box and made it join us in our physical travelling. Wireless networks and mobile technology have blurred the boundaries of the virtual and physical worlds, enabling us to move seamlessly between them. Smartphones, tablets and laptops help us take the Internet on the move, changing the way we experience places and redefining interactions. "The

option to interact and participate belongs to the pivotal attributes of digital media" (ag4, 2006). In the same time, buildings and urban public spaces become infused with media transforming their presence and changing perceptions.

"Of course, physical space has long been augmented by images, graphics, and type; but replacing all of these with electronic displays makes it possible to present dynamic images, to mix images, graphics, and type, and to change the content at any time" (Manovich, 2006b).
Urban screens have multiplied and evolved, fusing with the buildings and generating a new hybrid form of architecture: media architecture. Futuristic images of the city from movies like *Blade Runner* (1982) or *Minority Report* (2002) are more and more resembling reality; we are living in a highly mediatized society and we are all about the visual.

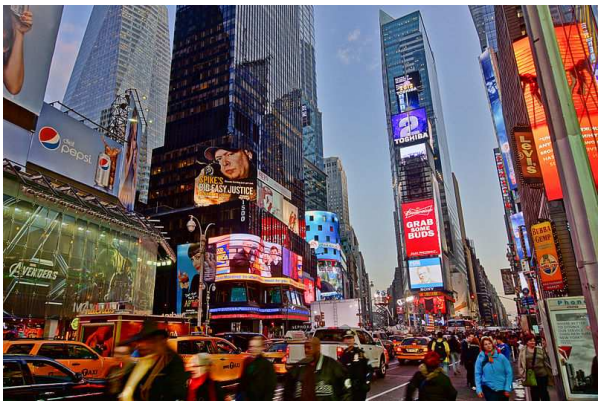

Fig. 1. Advertising in Times Sqaure, New York, April 2012, © Jean-Christophe Benoist, Source: Wikimedia Commons (2012a)

The way architects and designers approached this paradigm shift shows a large variety of responses: from Robert Venturi who treats media installations as an ornament, a highly advanced billboard (Venturi, 1998), but just a decor for architecture, to Toyo Ito who considers that architecture today must be a form of media suite in relation with natural and informational environments (Ito, 2005), or to Lars Spuybroek's vision of a metamorphosed ambient, an architecture "swallowed up by technology so that it becomes completely capable of absorbing and enhancing the body's rhythm" (Zellner, 1999).

Recent advancements in LED technology, projection mapping and computational capacities have brought a new wave of hybrid spaces, affordable (sometimes sustainable) and easy to develop from design to implementation, making them fit for experimentation and thus moving them further from the advertising industry into the art sphere and broaden their audience (although advertising itself is not considered an art form, some of its products could arguably be considered artistic). In a constant race for attention, the advertising industry has been the main promoter for media architecture development, bringing creative and unique installations to life and providing new expressions for urban public spaces.
"Never before was there an interface between the physical and the digital world, which was public to such an extent, that it appeals not only to individual users, as in the case of a personal computer, but also to whole groups or even to a whole urban population and that furthermore also allows to "reply", i.e. to interact with a façade or to design its content" (Tscherteu, 2010).

The evolution of technology in the recent years (both in hardware and software) promoted the sprawl of augmentation in the city, generating a large variety of manifestations, from conventional large screens (wrapped on the buildings) to media architectural hybrids where the pixels become architectural elements.

Augmentation of space can be also on a much smaller scale, achieved through smartphones, tablets or the latest prototype of glasses developed by Google called *Google Glass* (glasses that provide dynamic information in close relation with what you see). This type of space augmentation is highly individualised, can be customised by each user and it is more private than the large scale version. While the small scale augmentation has great influence in the way we experience public (and sometimes private) space, I will focus on the large scale augmentation, because it is responsible for a powerful transformation of space, a transformation that anyone can perceive.

The definition provided by Lev Manovich has two aspects: it describes a technique (overlaying dynamically changing information) and it describes the content (multimedia form that is often localized for each user – emphasis on *often*). While both large and small scale contemporary space augmentations are in multimedia form (thanks to the digital revolution), small scale augmentation is more localized for each user. Achieving user customization in large space augmentation is not that often, due to its dedication to larger audiences. However, user interaction with the content of a media wall or media facade (both in physical and virtual way) can be considered a form of localizing the content to its users, but not all augmented spaces are interactive.

Considering that the current mobile technology offers the possibility to virtually augment every space (at a small scale, using GPS and the Internet), I will consider from now on an augmented space only the large scale cases, where the augmentation is visible to anyone in that space.

2. Advertising & branding – novel techniques in space augmentation

Urban screens have become associated with advertising from their early stages, so when they started to merge with buildings they transferred this association to the media facade. "The majority of current urban media installations are unimaginatively cobbled-together arrangements of television monitors in XL format" (Edler, 2010). But media facades, even if developed for advertising purposes, are not large screens on a building, they are a hybrid of architecture and media where the screen is no longer a parasitic entity on a building but instead developed a symbiotic relation to various degrees up to the point where they are so infused with one another that there is no possible separation between the two (without damaging the other). Taking into account that some technologies and techniques developed for commercial purposes have been also used for artistic experimentation, I consider noteworthy a quick look over some of the most notable advertising and branding productions of media architecture (in a chronological order).

2.1. The Chanel Ginza Tower (2004)

The biggest Chanel boutique is located in the Ginza district in Tokyo, one of the most luxurious shopping locations in the world. Designed by architect Peter Marino, the 10 floor building was meant to become a landmark in the region, presenting the brand in a novel yet elegant way. It was the first media facade developed with an integrating LED system inside its glass curtain wall and it is the largest black and white video wall. Although the display is integrated in the building, during its active time (from dusk till dawn) the inside blinds are engaged automatically to provide a black background for the video images. During

the day, the blinds are retracted and the facade is mostly transparent. The positioning of the LEDs and their aluminium casings resembles the famous Chanel tweed pattern, which becomes visible during the day. The novelty resides in the use of a media facade for branding, without using conventional opaque urban screens and usual commercial ads, while maintaining the image and silhouette (both during the day and night) associated with the company.

Fig. 2. Chanel Tower at night, Tokyo, Japan, 09.2007, © Tony Wu, Source: Flickr.com (2007)

2.2. T-Mobile headquarters (2004)

The first transparent media façade was realized by *ag4 mediatecture company*© in 2004 for the T-Mobile campus in Bonn, consisting of a steel mesh and aluminium capsules with LEDs over the glass façade. The commission brief consisted in finding a novel way of placing the T-Mobile brand on their new building facing the plaza, without destroying the transparency of the architecture,. Unlike most screens that cover a building's façade to the point of annulment, dominating and unflattering the architecture, the transparent media façade from ag4© has the subtlety of blending with the architecture. A powerful phenomenon appears in the black areas of the image (where there is no light) making visible the architecture "behind" and putting it into the foreground. In a similar way, if the space behind the image has the same degree of lighting (artificial or natural) as the one from the LEDs then they are both visible. These effects transform the system in a true media architecture, where the building and the layer of images are interwoven, simultaneously readable, thus generating a new aesthetic that resembles the Photoshop technique of stacking layers with different transparencies on top of each other. At the same time, the view from inside out is mostly unhindered, one key aspect for the quality and comfort of the interior space and for the activities held there.

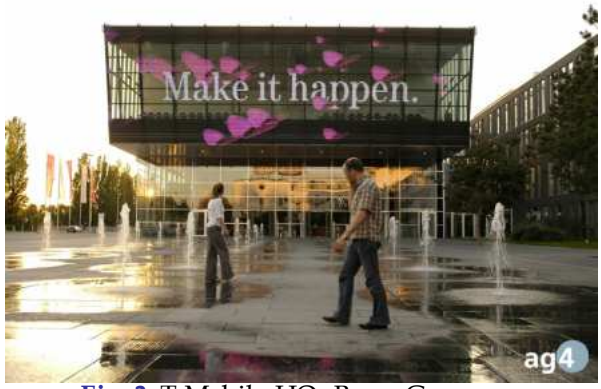

Fig. 3. T-Mobile HQ, Bonn, Germany, 2005, © ag4 mediatecture company, Source: ag4.de (2005)

Developed as a branding tool, the transparent media facade brought a new way of merging media with architecture, maintaining high resolution images

whilst playfully moving back and forth with the architectural transparencies. The company developed the transparent media facade installation further, with the GKD Company and now two products with similar properties are available: the Mediamesh® and the Illumesh®. Besides the hardware, ag4© also developed a software for the display with special alternation algorithms providing a non-repetitive succession of images and film.

2.3. SPOTS (2005-2007)

Placed in Postdamer Platz, Berlin, the project realised by *realities:united* studio was a temporary installation (18 month starting with November 2005) whose purpose was to draw customers for renting the empty building in one of the most exclusive areas in Berlin. The commission brief was designing the largest media art display in an urban space. Financed by HVB Immobilien as part of their marketing campaign, the media content was devised as mainly artistic (six out of seven days) and only on Mondays to run advertisements to ensure income. A curatorial program was implemented inviting artists to use the unique platform for their own works and also to create adaptations of ads for prestigious companies.

The starting point was the BIX technology used at the Graz Kunsthaus – fluorescent lights controlled individually. The team devised a grid of large scale pixels (approximately 40cm in diameter with an 82cm pitch) grouped asymmetrically. On top of this grid they placed the glass curtain layered with semi-transparent colored films providing a better diffusion of the artificial light thus enhancing the image readability. The entire installation of light pixels and colored screens variously shaped and positioned is a constant presence in the urban space, regardless if it's turned on or off. Besides, one of the main requests was to provide an adequate aesthetic look during the day, when the program was not running.

The project researched aspects of screen borders, transitions between building and display, the aesthetics of the visible elements of the installation as well as the expressive qualities of low resolution images. The endeavour may seem outdated compared to the overwhelming spread of large LED screens with high resolutions and high definition images rivalling the cinema, but the curator Andreas Broeckmann revealed the expressive potential of this large installation that had significant artistic sensibility while being simpler and non-intrusive.

Among the noteworthy programs was the work of Nicolai Carsten called Sensor which though the use of various sensors in the area, feeding data (such as movement and density in the square, noise and light levels etc.) to a processing software, generated abstract images that reflected life in Postdamer Platz. Sensor is graphically representing the pulse of the area it addresses on its display.

The success of *SPOTS* comes as a confirmation of the importance for an architectural approach in such projects in urban spaces and the need for architects' involvement in their development from the early conceptual stages also including media content.

These projects opened up possibilities for different, more artistic and creative approaches for the design and usage of media facades, showcasing two distinct preoccupations: abstraction and

transparency, where one doesn't exclude the other. While the design of *SPOTS* is oriented towards the deconstruction and the reinterpretation of a typical display (the shape of the frame, screen and pixels), the T-Mobile Headquarters building and the Chanel Ginza Tower are more concerned with adapting high resolution images within the facade and also maintain a required level of transparency.

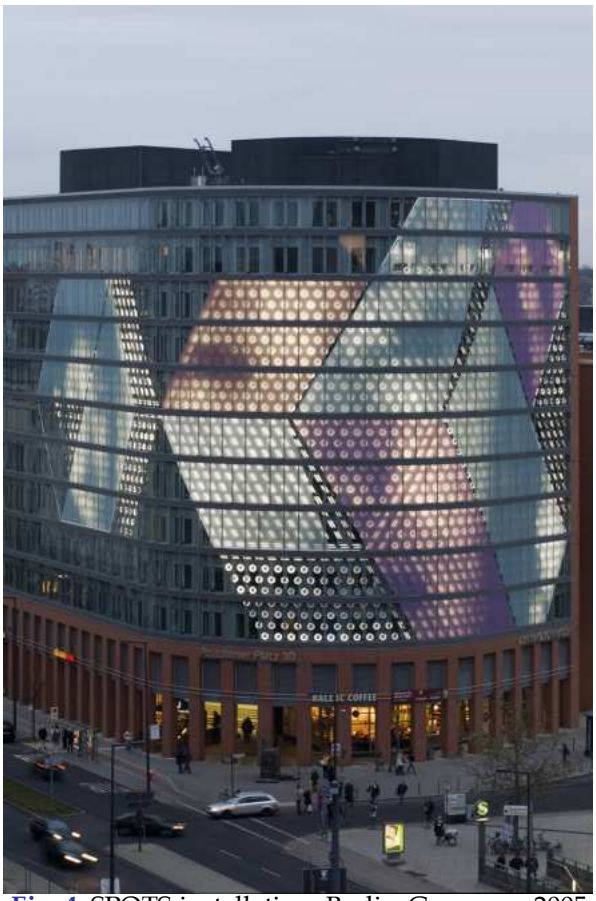

Fig. 4. SPOTS installation, Berlin, Germany, 2005
© Bernd Hiepe/Bernd Hiepe Fotografie, courtesy of realities:united
Source: realities-united.de (2005)

3. What's there beyond advertising?

At the first *Urban Screens Conference* in Amsterdam in 2005, Mirjam Struppek defined the urban screens as "various kinds of dynamic digital displays and interfaces in urban space such as LED signs, plasma screens, projection boards, information terminals but also intelligent architectural surfaces being used in consideration of a well-balanced, sustainable urban society - Screens that support the idea of public space as space for creation and exchange of culture, strengthening a local economy and the formation of public sphere. Its digital nature makes these screening platforms an experimental visualization zone on the threshold of virtual and urban public space" (Struppek, 2006). This definition shows the strong concern toward the social aspects of public space augmentation, underlining the cultural potential of this technology.

In the past several years these tendencies have been explored, resulting in a large array of installations from small exhibition spaces or cafes, towards high office buildings or museums, being temporary or permanent, inside or outdoors; some aimed at raising social awareness, others devised for joyful experimentation in public space and others for entertainment purposes. Technologies vary, from one production to the other, each customised for its specific demands, adapted or invented altogether, eluding clear dassifications. Under these circumstances I will illustrate cases that have brought novelty to this area, from different programs and with different aims, attempting to form a wider image of uses and techniques, outside the advertising or branding sphere.

3.1. Touch (2006)

In the case of the project *Touch* developed by Lab[au] for the Dexia Tower in Brussels in 2006, anyone passing through the square could change the colour, patterns and movement of the lights making his own show over the city night sky. Using individually controlled RGB-LED lamps the installation could

illuminate each of the 4200 windows of the tower.

Fig. 5. The Dexia Tower and the pavilion with the control interface, Brussels, Belgium, 2006, © LAb[au], Source: lab-au.com (2006)

Touch used these lamps with a custom software and interface aiming at transforming the office tower in an urban light sculpture during the night, distancing the façade association from the corporate design and bringing it closer towards urban art and performance (Abendroth, 2010). For this purpose a special interface was implemented (a touch screen) inside a pavilion in the Rogier Place (at the base of the tower). Each point on the interface was linked to a window, the entire contact surface representing the unfolded façade of the tower. The interface detects touches and can interpret gestures to generate points, lines and surfaces assigning positive or negative values depending on the orientation of the gesture. In the same time anyone using the interface could take an instant photograph of the building with the animated composition and email it via the interface (there have been recorded over 3000 user snapshots each month). The tower height of 145m makes it visible throughout Brussels and the custom, user generated look on the night sky has a visual influence over the city. This project transforms experiences and the way we identify with and within the public space – it defines architecture as interface.

3.2. BMW Square (2008)

Part of the integration of a new museum in the signature BMW headquarters building in Munich was the implementation of a media installation within the entire exhibition. The main focus was to apparently continue the outside street on the inside of the building by using the existing spiral ramp. But the centrepiece of this refurbishment is the BMW Square – Mediatecture installation by ART+COM and Atelier Bruckner that became the vibrating core of the permanent exhibit.

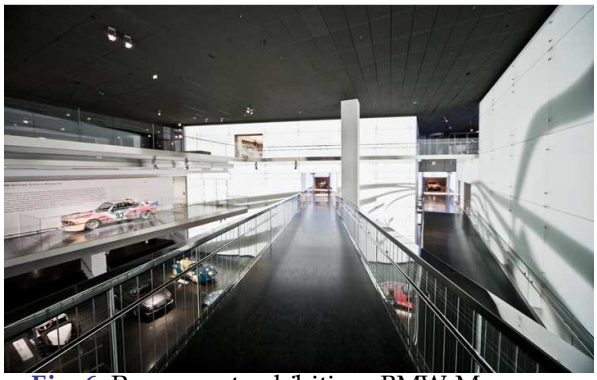

Fig. 6. Permanent exhibition, BMW Museum, Munich , Germany, 2008, © Marcus Meyer, Marcus Buck, Source: atelier-brueckner.com (2008)

The exhibit benefits from an open space of 13m in height, being crossed by walkways allowing the visitor to admire

the cars below. The installation covers the entire interior walls (spanning over 700 square meters) and consists of two layers of white satin glass mounted over a display made from more than 1.7 million monochrome LEDs. The purpose of the satin glass is to create a diffusion medium for the light emitted by the diodes and to generate a continuum and translucent space, surrounding the entire exhibition and sets it in motion. The media content is either an abstract or themed animation creating an effect of softness and dematerialized architecture. In the same time the display responds to the presence of visitors, engaging them in its scenery.

3.3. La Vitrine Culturelle (2008)

Designed by Moment Factory Company (in collaboration with Steven Bulhoes, Marc-André Baril and PHOTONIC Dreams) for the Montreal information centre, the installation aimed to create a unique urban experience. The facade is dynamically responding through various animations to the presence and movements of people in the street outside.

Fig. 7. La Vitrine Interactive media facade, Montreal, Canada, 2008, © Moment Factory, Source: momentfactory.com(2008)

Enticing and playful, the installation invites passersby to interaction and discovery of Montreal culture (by entering). Initially devised as a temporary installation, *La Vitrine* became permanent due to its success with a larger audience, including tourists and residents, also winning the Grand Prix Créativité Montréal 2008 in the category "urban integration urban planning". The 23 square meters display is made from a low resolution matrix of light bulbs (around 35,000 LEDs) and is linked with movement tracking devices. The animations include text and abstract graphics in a multicolour display, drawing attention and inviting to play; the dynamic behaviour somewhat resembles pinball machines.

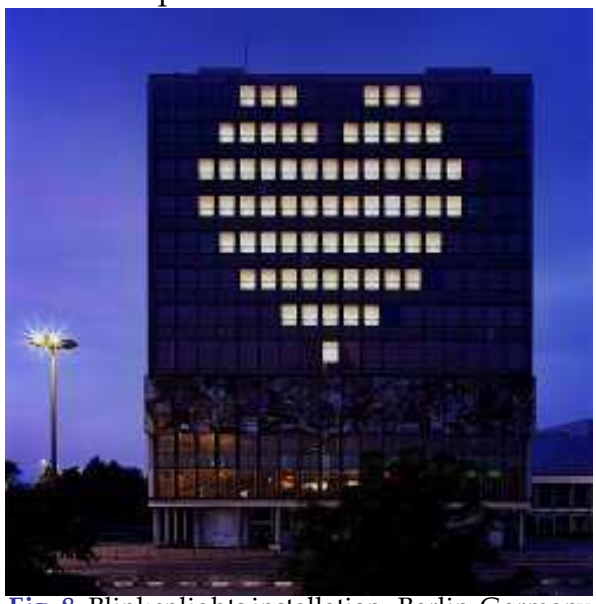

Fig. 8. Blinkenlights installation, Berlin, Germany, 2001, © Dorit Günter, Nadja Hannaske, Source: blinkenlights.net (2001)

3.4. Stereoscope - Blinkenlights (2001/2008)

Project Blinkenlights started in 2001 with the temporary installation in the Haus des Lehrers, Alexanderplatz in Berlin, celebrating the 20th anniversary of the Chaos Computer Club. The principles of interaction and display behind this first installation were also used in the groups' latest production, in Toronto's City Hall. Active for only a week in October 2008, the installation called Stereoscope used the 960 windows of the two curved buildings as monochrome pixels and invited the public to generate the

graphics and animations through various platforms. One characteristic of the Blinkenlights projects is the transformation of the facade to a game interface, users being able to play classic computer games via their mobile phones. Also, this installation allows anyone with Internet access or mobile phones to send and thus display their art work on the large screen, transforming the facade in an urban canvas for static or dynamic graffiti made of light. The low resolution of the medium (both in the first and latest projects) generated symbolic images with a large impact, some of them becoming iconic for the digital culture today.

3.5. The Crystal Mesh (2009)

The installation developed by *realities:united* studio was created as a décor and media façade for the ILUMA complex in Singapore. The building was the first part of a larger government funded project aimed at shaping the nightlife of Bugis district. The working principle was to provide a certain shape to the light source, moulding the pixels so that the façade would also have an expressive look during the day, not only during the night. The novelty resided in the creation of a crystalline polycarbonate structure for each light source, which rather than being placed behind a transparent smooth wall, shattered it and wrapped it around.

The result was a three-dimensional fabric with a specific topography that explores the aesthetics of a light bulb as decorative element. Taking into account the development forecast for the district, more buildings being scheduled for construction in the next ten years, the aim was for a simple but powerful image for the complex that maintains its strong presence even after the completion of the newer buildings that can benefit from the latest LED display technologies. The media content had to be custom made for this installation; the resolution and the display technique don't allow the creation of homogenous images but rather a "medialized" feeling of the building. This appearance becomes an important architectural ingredient for establishing a visual connection between the hosted architecture programs (cinemas, theatres, pubs, restaurants and retail shops) and the urban scene.

Fig. 9. UEC Iluma construction site with active media facade, Singapore, 03.2009, © Jan Edler, courtesy of realities:united Source: realities-united.de (2009)

3.6. Balance Tower (2009)

One of the first sustainable media architectural projects was realised by *ag4 mediatecture company*© in Barcelona for the water reservoir of a newly developed pumping station. The installation is made out of metal, photovoltaic panels and LED stripes emphasizing the vertical silhouette of the building. The installation was devised with the purpose of raising social awareness towards environmental issues of energy and water consumption. The LED display is active during the night time, using energy stored during the day and distributing the rest of the accumulated energy in the public network. With a simple, minimal and monochrome design, the media content evokes water movement patterns in all its

three states. Typography elements are also included, but in a smaller doze. The abstract and figurative animations cover the entire cylindrical building and unlike most productions from ag4© do not hold a narrative sequence nor high resolution images. The presence of the water reservoir has been transformed into an aesthetic and message bearing sleek installation, drawing attention to "green" design and sustainability issues.

Fig. 10. Transparent media facade of the Balance Tower water reservoir, Barcelona, Spain, 2009, © ag4 mediatecture company, Source: ag4.de (2009)

3.7. 555 Kubik (2010)

A very different take on augmentation of public spaces is the technique developed by the German company *Urbanscreen* called 3D projection mapping and is the successor of the 19th century *son et lumiere* spectacles. This very particular type of media architecture is noteworthy because it allows a non-intrusive approach to urban space, especially when monuments are involved, and allows a playful reinterpretation of the architecture in both volume and details. One of the best examples is the *555 Kubik* project (also entitled "How it would be if a house was dreaming") where the projection completely transforms the stone grid of the facade, giving it various depths and textures while accompanying the process of transformation with sounds of moving stone blocks. The technique is not just a simple image projection; it is site specific, mapped to perfection on the architecture of the building and requires digital technology for surveying and 3D modelling.

Fig. 11. Sequence of the 555 Kubik projection on the Hamburg Kunsthalle, Germany, 2010, © urbanscreen, Source: urbanscreen.com (2010)

This is a technique that allows a complete makeover of the building for a short time; it is entertainment and performance oriented and aims to generate an emotional response. Even if the main effect is that of distortion and playful machination, the after effect is that the public starts to see the building and its architecture with renewed interest and perceives its presence in the urban context with new emotional associations. This short-lived, event based and non-intrusive augmentation captures and fascinates its audience but it is meant to be temporary and preferably a one-time show. "Such interpretations are naturally dependent upon a certain amount of artistic freedom and [...] they cannot really be considered as part of the architecture" (Kronhagel, 2010a).

3.8. London 2012 Olympics ceremonies

Danny Boyle, the artistic director of the 2012 Olympic Games in London declared: "Every Olympic Ceremony aims for a major technical breakthrough. Our remarkable audience pixels have opened up amazing new images, effects and spectacle, but most of all they have

enabled our live stadium audience to be part of the ceremony in a way that's never been possible before" (Etherington, 2012).

Fig. 12. Closing ceremony of the Olympics, London, 2012, © Philip Pryke, Source: Wikimedia Commons (2012b)

The installation devised by Crystal CG, called "pixel", was made out of 70,500 small panels with nine LEDs each, held by the audience and thus generating a 360 degree multicolour digital display. The animation was in resonance with the music show, being in fact a stage design. Nonetheless, this installation is worth mentioning not only for its scale but for the transformation it brought to both TV viewers and participants to the festivities. This kind of integration and transformation of the space by means of immersing the audience and blending virtual dynamic images with live-action performance is a unique form of space augmentation. The dynamic images were also helped in some moments by the movement of the people holding the panels, thus becoming the largest cyborg video display, in which humans and pixels merged imprinting motion to the already animated images.

3.9. Spine (2012)

Kollision design office was commissioned to devise an interactive installation for the Media Architecture Biennale in 2012 held in Aarhus, Denmark. Made from twenty individually computer controlled cubes with lights inside, the dynamic installation is moving (accompanied by different sounds) in response to its environment. The fluid motions, degrees of lighting and atmosphere sounds are controlled by behavioural algorithms in relation to its surroundings (people, noise, movements etc.) generating different moods, varying from curiosity to shyness and avoidance.

Spine is but one of the many "living sculptures" realised in recent years, aimed at transforming spaces and interacting with their users or environments. These can be kinetic art works in exhibitions or light installations for public or private spaces, either way they present a growing preoccupation for "smart objects" augmenting our physical world.

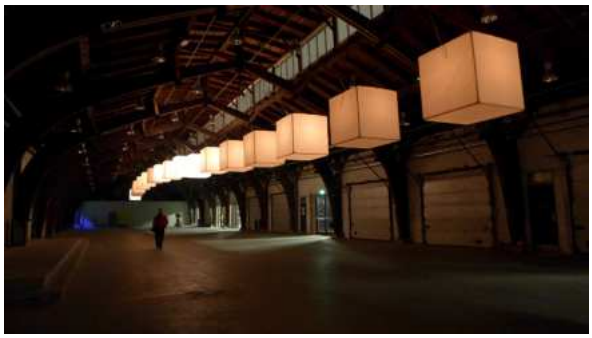

Fig. 13. The Spine installation displayed at Godsbanen in Aarhus, Denmark, 2012, © Kollision, Source: kollision.dk (2012)

4. Traces and perspectives

From the previous examples emerge three main directions of space augmentation (apart from the advertising industry, which include corporate branding): one is for entertainment purposes, another is focused on artistic endeavours and sculptural objects and another is preoccupied with making a statement with its presence. These

directions are not divergent neither very distinct from one another; they intertwined in most of the cases but one of these three main features is more prominent than the rest.

The entertainment direction is usually the most dynamic visually, looking for capturing the attention and fascinate its audience for a determinate period of time. The media content is usually highly graphic and benefits from high resolution images. Much like in the case of television or cinema, it usually has a well-structured program and requires a viewing behaviour (less movement or interaction and more watching). This space augmentation approach is mostly destined for events and festivals and it is an attraction point in itself. Light and sound shows, cultural festival, sport event or different ceremonies or fashion shows are all benefactors of the latest media and space augmentation technologies.

The artistic and object oriented approach is more prone to experimentation and interaction, sometimes offering only a platform without any previously structured content, switching the power to the users to control the media (this resembles the logic of Web 2.0 and its social networks where platforms like *YouTube, DeviantArt* or *Instagram* have only user generated content). The Blinkenlights Project is probably the most famous in user generated content, but interactive media facades such as *La Vitrine Culturelle* can also be included in this category, since the displayed output is variable depending on the human actions (or inactions). In this category two main areas can be observed: the ones where the object itself is the focus point (the case with Lab[au]'s *Touch* installation, or the *Spine*) or the one where the augmentation itself is not the central piece and it aims to be more an ambient generator, drawing less attention. This second direction is very interesting to architects, because it is a medium to achieve different adaptable or responsive environments and improve the quality and experiences of the spaces they configure. This kind of augmentation is likely to be used in exhibition spaces, mostly indoors but not exclusively (the largest one to date is the BMW Square installation in the BMW Museum in Munich). Also, various pavilions at recent World Expos have employed means of space augmentation through media facades (the African Pavilion in 2008 at Zaragoza, Spain or the Danish Pavilion in 2010 at Shanghai, China to name just a few).

Object oriented augmentation includes medium sized "smart" items but also larger ones, like the vast majority of media facades. Most media facades (if not used for advertising or corporate branding) are artistic installations designed to offer a specific presence to the building but also to enhance the adjacent public space (usually a square, a large intersection or a boulevard), functioning as an art piece. Cultural buildings are the dedicated benefactors of this technique: Graz Kunsthaus with its BIX media facade – developed by realities:united (the same technology used for the SPOTS temporary installation), C4 installation realised for the Cordoba Contemporary Art Centre (also realised by realities:united) or the Ars Electronica new building in Linz to name just a few. Characteristic to this approach is the abstraction of the medium, most of the media facades have low resolutions (sometimes monochrome) and custom made media content, usually of a non-figurative nature like in the case of the *Crystal Mesh* or the *Alliantz Arena* in Munich, Germany.

„Social infrastructure has long involved architecture, but has also more recently included network computing. The latter tend to augment rather than replace the former; architecture has acquired a digital layer. As with past layer of technology, such as electrification, mechanical equipment, and transportation, so now digital technologies extend architecture's reach" (McCullough, 2005).

Most of the permanent installations (including the ones dedicated to advertising) can be reprogrammed to accustom special campaigns destined at raising social awareness in addressing different issues (such as community identity, urban values, environmental problems or various social and cultural aspects). That's one of the many advantages of the digital media augmentation of space – it's content is not necessarily permanent, it can be adapted to respond to the current society needs, it can be turned off entirely (sometimes as a solidarity sign) or turned into an information platform as was the case with the recent tragedy in Japan.

Apart from the art and entertainment (and their ability for adaptable content depending on the demand), space augmentation can be designed from the very beginning as a statement making presence. Be it environmentally oriented or addressing identity issues or any of the previously discussed aspects of urban and community life, media architectural augmentation can be a useful tool. Such installations are usually less posh and more focused on the message. The media content is very specific and in most cases the type of content generates the design of the installation. This area is sometimes overlapping with the arts, most dynamic art objects also aim to create urban or community identity and to have a social and cultural meaning. One such example is the Project Hope in Munich that created a unique piece of dynamic art by the installation of LEDs on a wind turbine. Consuming less than a hair drier, this low resolution installation is still able to generate stunning visual effects, combining the artistic program with a deeper meaning about sustainability and environmental issues.

Given the large variety of approaches, techniques and purposes contained in the development of augmented spaces, their effects and impact on architecture are difficult to comprehend entirely (still being actively explored).

"It is now apparent that mediatectural work has primarily established itself in two fields: first, in the scenographic charging of interior spaces such as trade fairs and exhibitions or forums and lobbies; and secondly, in the hype of media facades. However, it seems to be valid in both cases that the technological seduction is often in the foreground and the sustainable usage remains to be seen" (Kronhagel, 2010b).

For architects, this presents a new challenge, on one hand the seduction of a new technology where "the medium is the message" (McLuhlan, 2001) and on the other the need to understand and control a different language: the one of new media. Architecture deals with subtlety and a certain degree of secrecy (this is a rough and debatable generalization but it is useful in making a comparison) while new media is quite franc and explicit; one is solid, stable and lasting, the other is evanescent, active and very fragile; but both are meant to achieve an emotional response and maybe this is why they can be blended to various degrees (resulting different levels of abstraction).

But no matter how concrete or abstract the media content of augmented spaces is, the effect is dramatization of architecture. Of course it can be easily argued that architecture has developed its own tools for dramatic achievements, but the result is still static; animation is suggested, not displayed.

"Beyond the statics of the normal facade or simple light-facade a la Las Vegas with their rather stereotypical patterns, the contemporary, digital-technology-based mediatic facade allows of more and indeed subtler means of expression" (Wasserman K. and Buhlmann V., 2010). Even if this statement is referring to media facades, it is also valid for interior augmented spaces, proven by installation like *Spine*.

But what about the long term implications of this expanding phenomenon? The risk is an overflow of information and an oversaturation of stimuli that in the long run leads to an indifference towards both information and space. The cases of Times Square in New York or Shibuya Crossing in Tokyo with their overcrowded displays stand as proof that collages of screens (and commercials) if not attuned create only white noise and discomfort. Of course, these places function now on a very different premise, they have become attractions precisely because of this congestion and continue to draw attention (not to individual elements, but as an ensemble).

Another (quite different) risk to which augmented spaces are exposed is the misuse of their installation. A faultily media content can determine discomfort and angst in the way space is experienced. To avoid this as much as possible, architects and media artists must collaborate and the information stream must be designed in strong relations to the needs of the space, in order to have control over the effect. "Images and fixed image sequences can quickly become subject to mental wear-out, and repetition can rapidly lead to oversaturation and repulsion from the viewer" (Lusche, 2010).

5. It is only the beginning

"The human world is becoming richer, and the richer world will become much more capable of being affected by art. An artist is a person who has developed those capacities to be affected by things as well as capacities to affect things" (DeLanda, 2009). The presence of dynamic images in the urban space gives a major advantage in drawing attention; we are a society fascinated by the visual and new media has become a constant in our lives (be it on the computer monitor, a smartphone, on TV or in a bus station, on or in buildings), digital images have become ubiquitous. "The computerization of culture not only leads to the emergence of new cultural forms such as computer games and virtual worlds; it redefines existing ones such as photography and cinema" (Manovich, 2001). Bringing new media in architecture will not replace the way architecture is understood and practiced, it just offers an alternative, much like all media technologies that appeared did not meant the end of previous ones – television did not permanently replaced radio or written press, the Internet did not mean the end of books and synthesizers were not the end of classical music; the effect is to open new ways of thinking, new approaches and a reconsideration of the paradigms, it brings the challenge of redefining the things we used until then, be them spaces, telephones or design techniques. "Following the viral

dissemination of music through its digitalization, there will probably also be a similar development in the field of visual, digital art. Perhaps it is no coincidence that in turn the performance as live act undergoes a revival in contemporary art. Here, everything is "genuine" and "real"- "live" art" (Lieser, 2010). New media augmented spaces are now used in exhibitions and commercial buildings, indoor and in urban public spaces, addressing the passersby and are almost inexistent in residential spaces. Nonetheless, the technology tends to become invisible and it is quite possible to whiteness the proliferation of intelligent objects in our homes. Under such circumstances it becomes vital that architects collaborate with media and interface designers to ensure the desired behaviour of such smart spaces. The potential of architecturally integrated electronic media to augment spaces is to generate interfaces towards virtual worlds. The architecture's native "virtuality" is amplified by the use of new media and leads to the development of new expressive techniques; in other words, the need arises for coordination between architecture and media, not only on a technical level but also to study the effects of these hybrids over human perception and to avoid an oversaturation with stimuli of our environment.

"The artistic possibilities for architecture that arise from this are still hard to grasp. Therefore many architects see the integration of pixels into the façade as a threat to architecture instead of seeing it as an expansion of architecture" (Tscherteu, 2010).

Augmenting interior or outdoor spaces, with or without a commercial end, is another way contemporary architecture breaks from the modernist tradition. What is seen by some as an ornament and by other as a means of adapting to the demands of the digital society, has brought a new approach in design; interfering and blending time variables, dynamic adaptable behaviours, interactivity, communication and architecture transforming stability in movement and dematerializing solids. To some extent this is the promise of the early digital architecture experiments, reaching for changing every constant with a variable and creating adaptable environments.

Fig. 14. i-City/Russian pavilion at the 2012 Venice Biennale © Patricia Parinejad, Source: archdaily.com (2012)

Augmented spaces, regardless of the means or the purpose are by excellence performing spaces, where artistic endeavours are pursued and aesthetic aspects play an essential role. Small scale objects or large spatial installations embed communication with individual or multiple users, with their environments (digital or physical ones), even with each other in a continuous "space of flows", and "reconceptualise new forms of spatial arrangements under the new technological paradigm" (Castells, 2004).

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