Otherwise Engaged

New Projects in Interactive Design

What are the possibilities of interactive technologies delivering a new level of social engagement in architecture? Taking 2002, with the ETH Ada project and Diller & Scofidio's Braincoat project, as an important watershed, Mark Garcia reviews the advances that have been made per se, and with four projects in particular, in socially interactive spatial design.

Man's specific humanity and his sociality are inextricably intertwined. Homo sapiens is always, and in the same measure, homo socius.

From Peter L Berger and Thomas Luckmann, *The Social Construction of Reality,* 1966[1]

Human life is interactive life in which architecture has long set the stage. The city remains the best arrangement for realising that human nature.

Malcolm McCullough, *Digital Ground,* 2004[2]

Since 2002 and the launch of two benchmark projects – ETH Zurich's Ada and Diller + Scofidio's[3] Braincoat – at the Swiss Expo, the promise of a socially engaged interactive architecture has begun to move from the realm of science fiction to reality. How interactive architecture should function in society, how interactive technologies should operate in more social and socially enabling ways, and how the general public, the public realm and public space should interface with these new design types are just some of the questions raised by current works in this emerging and burgeoning new field of design.

Humankind can now create lots of interactive and spectacular spaces, but are the relative social costs, benefits and risks justifiable? How do we evaluate the social impact of interactive (or for that matter any) architecture? How do we assess its social effects with respect to more conventional or more inanimate types of architectures? Can interactive architecture make space more productive, sustainable, social or meaningful? Can it create a public realm that is more flexible and adaptable to different users, activities and feelings? How do we create its content and who should maintain and manage it? What kinds of social life and social exchanges and transactions should the public realm encourage? Are these types of spaces significantly more interesting or desirable than other ways of being social, for example in bars, public squares or via the internet? What does 'social' in this context mean anyway? These types of controversial and pressing questions in the field of interactive spaces have unfortunately only been addressed in one major theoretical publication (McCullough's *Digital Ground*, 2004), and by a handful of avant-garde, conceptually driven and high-tech architecture and design schools such as the AA, ETH Zurich, Domus Academy, MIT, the Bartlett, Technical University of Delft and the Royal College of Art (RCA).

Many publicly funded academic practitioners have built or designed interactive spaces for multinational corporations (sited in private lobbies, offices and as special event features), yet these fashionable projects are generally installed for just a few weeks or months, and thus the extent to which they are useful experiments for more socially engaged works is impossible, at present, to predict. In 2004 Malcolm McCullough argued in his book *Digital Ground* that interactive technologies and design could best serve humanity and society through the design of interactive and public spaces that bore some relation to the specificity of the real places in which they were located. Many recent interactive projects in public spaces have attempted to engage the social realm and generate social interactions in the way McCullough describes, illustrating the current state of affairs in this field and addressing in very different ways the shifting issues and ideas surrounding socially engaged interactive space.

The four new projects featured here are among the most socially engaged works in their field. So how do they compare with benchmark projects such as the ETH Ada project and Diller + Scofidio's semi-realised Braincoat project for their realised Blur building? How far have we come since 2002? If, as McCullough claims, 'only when technology makes deliberative and variable response to each in a series of exchanges is it at all interactive',[4] then both Ada and the Braincoat project might seem to be as yet unsurpassed in the degree and quality of both embodied deliberation and the variety and complexity

Diller + Scofidio, Braincoat, Swiss Expo, 2002
This unrealised component of the Blur building on Lake Neuchatel proposed a wearable WiFi person-detection and identification system in which levels of affinity between personality types in individuals meeting in a blur of fog were identified through vibrating pads and a wearable electronic wireless device implanted in the plastic raincoat given to each visitor as they entered the building.

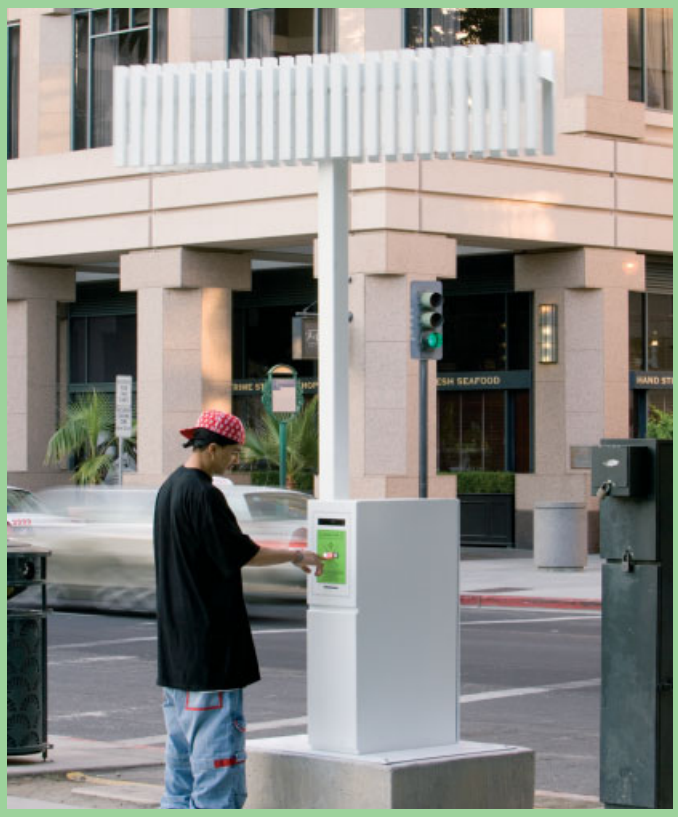
of the socially enabling, spatially embodied responses these spaces are able to create. Ada, considered to be the most intelligent real space designed to date, featured the highest levels of behavioural integration and time-varying and adaptive functionality into a single space. Ada was able to balance the flow and density of visitors as well as to identify, track, guide and group and regroup individuals and sets of people. She had a sense of vision, sound and touch and could baby-talk and play different types of games with the inhabitants as well as express her behavioural mode and emotional state using a continuous ring of video projectors.

The Braincoat project, though sadly rejected by potential corporate sponsors and thus only ever partially realised, remains an equally significant contribution to this field of research. In the proposal, visitors to the Blur building, suspended over Lake Neuchatel, would complete a detailed questionnaire before entering. Information from the questionnaire would then be fed into the Blur building's computer systems which, via a wearable electronic wireless device, would alert individuals to the proximity of other visitors with whom their personalities and tastes might compatible. Using speakers, luminous displays and vibrating pads, those in the Blur building would be able to perceive, directly and in real time, the likelihood of finding a friend or lover moving towards or away from them through the mist.

The Braincoat element of the Blur project did not achieve sponsorship and therefore could not be realised. However, as the four projects below demonstrate, the potential of this new field of design is now beginning to be realised. Not only have socially interactive projects begun to move into the public realm, they are now also receiving the financial support of both national governments and big business.

DataNatures, San Jose, California, 2005–06

Ben Hooker and Shona Kitchen



The downtown ticket installation in use. The everyday utilitarian look of the ticket printer was intended to help it meld seamlessly into the street furniture of its urban context, making this public art project an accessible, inclusive and surprising intervention into an innocuous part of city life.

The DataNatures installation produced a unique personalised ticket for each and every user shortly after they pressed the button.

DataNatures by interaction designer Ben Hooker and architect Shona Kitchen was a double site-specific electronic installation commissioned by the San Jose Public Art Program for 'ZeroOne San Jose: A Global Festival of Art of the Edge & The Thirteenth International Symposium of Electronic Art (ISEA)', 2006. It included two installations: one inside the domestic arrivals terminal inside Mineta San Jose International Airport, the other in Cesar Chavez Park, in downtown San Jose. Described by Hooker and Kitchen as an 'electronic artwork', the project was intended to 'reveal and celebrate the interconnectedness of seemingly disparate natural and manmade aspects of Mineta San Jose International Airport and its environs'. The installations took the form of 'ticket machines' linked up to a series of remote cameras placed around the airport.

On pressing a button, visitors were issued, in real time, with tickets resembling airline boarding cards that had been compiled by DataNature's custom-built software. These were a combination of a photograph of the user and both real-time and archived data (text and images) transferred via wireless systems to a PC encased within the installation. The resulting montage of information was unique to each person each time the button was pressed, and each ticket was a custom-made souvenir of that moment in San Jose. The data and images juxtaposed on the ticket were collated from websites which delivered data relating to the airport and the city of San Jose, such as flight times, weather, noise and acoustic mappings, news stories, historical facts and narratives. Cameras located around the homes of the protected burrowing owls that live on the airport site also added images of these nocturnal residents to the tickets, highlighting concerns for their disappearing grassland habitat and focusing attention on the environmental aspects of the airport.

DataNatures was designed to identify the airport as the gateway to the San Jose community. The twin locations of the installation represent San Jose's role as the birthplace of Silicon Valley, the interconnectedness of seemingly disparate sites and the role of new technologies in bringing together formerly separate but otherwise linked places. It resulted from interviews with airport employees, research into the otherwise hidden operations of the airport, and personal observations during visits to the FAA control tower, the security communications centre, baggage processing and inspections, noise-monitoring stations, parking management systems, airport concessions, rental car and shuttle bus operations, and maintenance and cleaning routines.

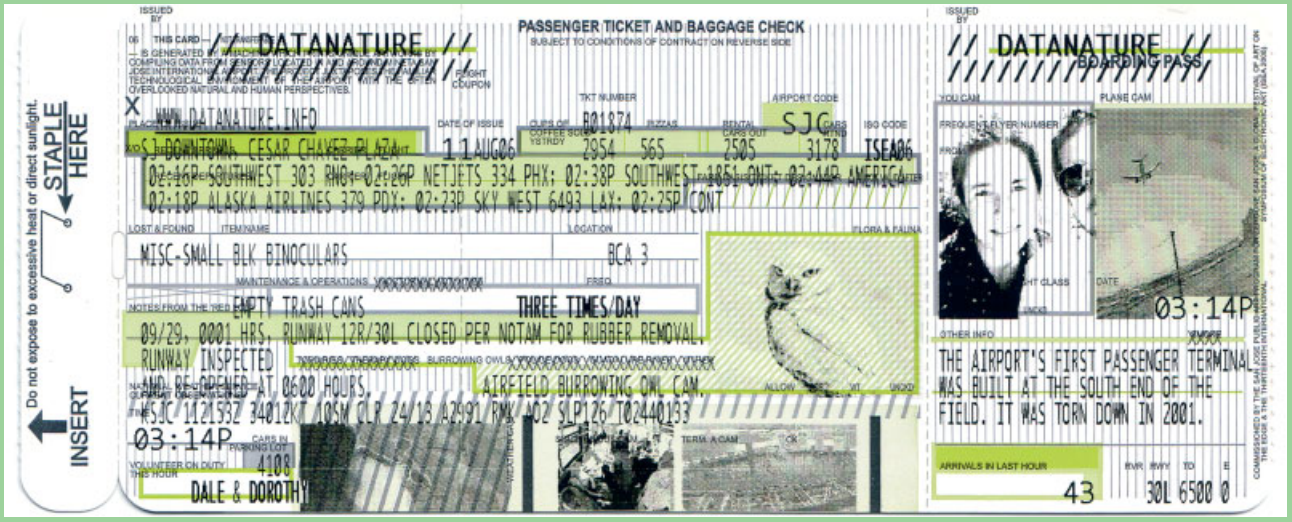
The social aspects of the project lie in its value as a critical, dissenting, site-specific work of art that is active across a number of social, cultural and environmental dimensions. As an informative tool for visitors to San Jose's local and natural communities it

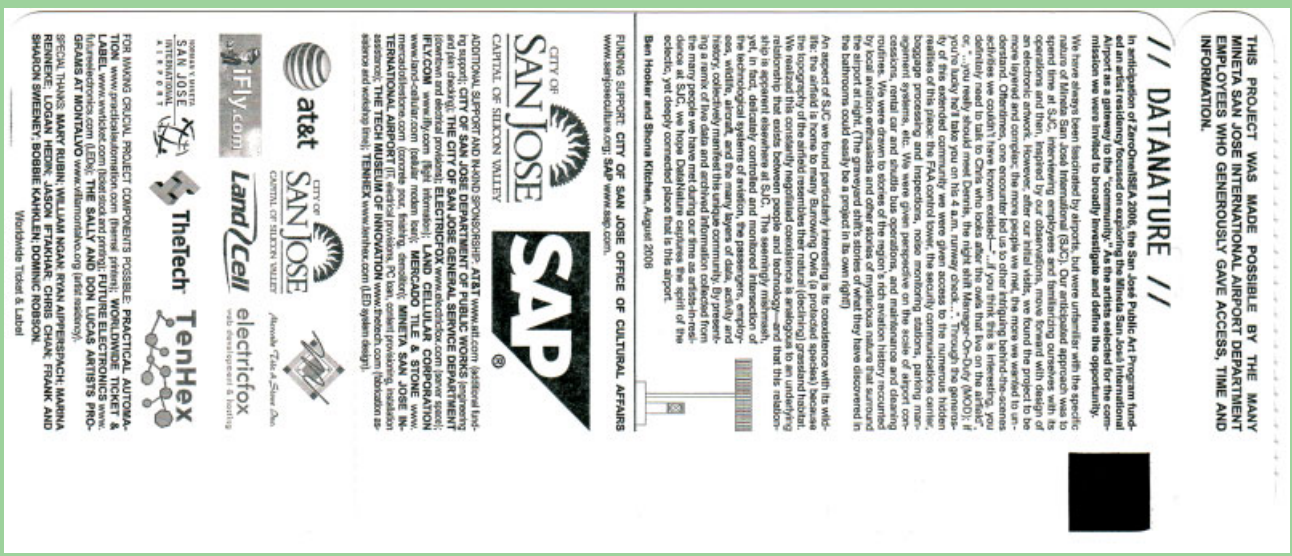
provided a multilayered and complex, though condensed, picture of the key factors, issues and events that have made the city what it is today. More creative and sophisticated than the bland tourist pamphlets usually available at tourist kiosks, it was on the one hand a modest souvenir machine, and on the other a complex and sophisticated critique and investigation into San Jose's history, its relationship with nature and its inhabitants. As a tool to generate social interconnectedness through artistic practices, it has undoubtedly helped to raise awareness of the local natural environment and the urban pressures upon it.

However, Hooker and Kitchen agree that some data they wanted to include on the tickets was denied them. Despite all our vast, detailed and real-time information feeds and databanks, and the complex data-mining, sensing, control and communications technologies that are now available, much of the dark underbelly of the life of the city and the more sinister activities and effects of corporations, groups and of individuals remain dangerously overprotected, confidential and maliciously obscure.

While this project may not be 'traditional' architecture, Kitchen sees these smaller-scale spatial experiments as indicative of the possibility of larger architectural ideas in which spaces have layers of telematic and informational content designed into them. Their recent speculative, unrealised project Electroplex Heights (2006) is another in Hooker and Kitchen's series of ongoing projects that examine the complex and disregarded poetics of telematic living. As part of the Vitra Design Museum's 'Open House: Intelligent Living by Design' travelling exhibition of 2006, it demonstrates, albeit on a larger architectural scale, the same approach to the design process and some of the phenomenological sensibilities and ways of perceiving and managing space as those implicit in the DataNatures installation.

Electroplex Heights provides a new vision for a technologically enabled community in which residents can deploy a variety of electronic objects that can sense, communicate and control elements of the larger physical and electronic footprint of the Electroplex Heights building complex site itself. Large external display screens (wirelessly linked to cameras and other sensors positioned and controlled by the residents) take CCTV out of the security rooms and into the art world of the 21st century. This exercise in Ballardianism would, according to the designers, 'encourage a community spirit that is not entirely dependent on physical proximity (as in conventional apartment buildings), nor entirely divorced from its immediate surroundings (as in Internet chat rooms)'.

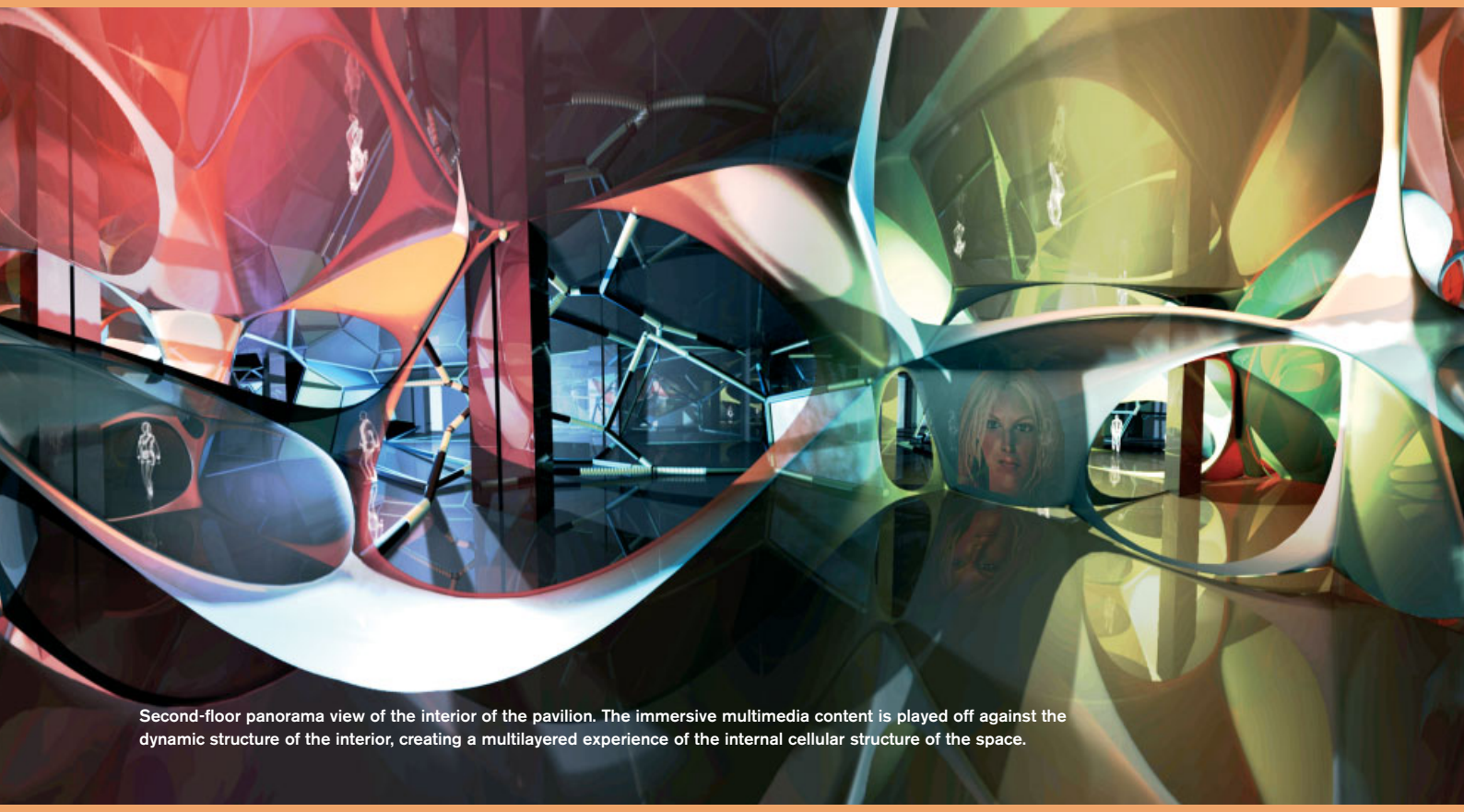




Each ticket was unique to an individual, a place and a time, the multiples representing a montage of information about the airport.

Digital Pavilion Korea, Sampang-dong, Seoul, South Korea, 2006

ONL



Second-floor panorama view of the interior of the pavilion. The immersive multimedia content is played off against the dynamic structure of the interior, creating a multilayered experience of the internal cellular structure of the space.

Digital panorama of the second floor. The Voronoi cell structure of the pavilion is controlled and kinetically manipulated using actuators in the beams of the structural system. The cell system breaks up into smaller, more dynamic and flexible components and spaces at key points (see centre of image) of the installation.

Kas Oosterhuis and Ilona Lenard (ONL) have designed and built some of the most famous interactive architectures in the world. As theorists, senior academic researchers and global architects they are precise about the nature of interactive spaces and the role of people within them: 'Interactive architecture is not simply responsive or adaptive to changing circumstances. On the contrary it is based on the concept of bidirectional communication, which requires two active parties. Naturally communication between two people is interactive, they both listen (input), think (process) and talk (output). But interactive architecture is not about communication between people, it is defined as the art of building relationships between built components in the first place, and building relations between people and built components in the second place.'[5]

For Oosterhuis, interactive architecture is not possible without an understanding and use of nonstandard architectural design and manufacturing processes where all the components are specific and unique to the building. Not content with buildings that are responsive or adaptive, he stresses the need for interactive architecture to be proactive and propositional (proposing and anticipating new building configurations or actions) in real time.

Interactive architecture for Oosterhuis is the 'art of conceptualising the CAS (complex adaptive system) and the art of imposing style and social behaviour on the active building materials, being aware of the fact that many of the constituting components are programmable actuators. The architect becomes an information architect … People relate themselves easier with dynamic structures than with static ones. It simply is more fun to watch live action than watching the paint dry.'[6]

This conceptualisation of interactive architecture is compelling and has been borne out in a series of immersive interactive architecture projects by ONL in conjunction with the Hyperbody Research Group, the unit for interactive architecture at the TU Delft, where Oosterhuis is a professor. The latest reincarnation in this series of projects is the Digital Pavilion Korea, located in the Digital Media City in the Sangam-dong district of Seoul. The project is an attempt by the South Korean government to produce a set of buildings to showcase the future of the country's new media, IT, software and electronics companies, and its technological strategies and economic policies . The pavilion is intended to be a five-year installation with the possible replacement of old technology on remaining hardware.

Designed as a series of interacting installations claimed to represent 'ubiquitous computing at its full potential',[7] its parametric morphology is derived from a 3-D Voronoi diagram algorithm. The surfaces of the interior are of darkened, LED-backlit glass to give the impression of an infinite, media-rich or translucent space. The beams of the Voronoi cell structure feature built-in linear actuators, able to alter the lengths of the beams in real time. The actuators, controlled via the handheld devices given to visitors, mean that users can actively control the building's internal form in real time (using the WiBro/WiMax technology embedded in the devices).

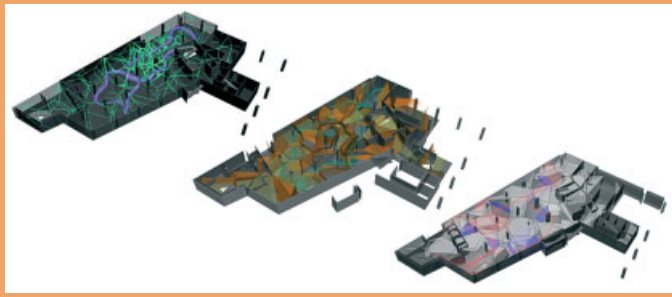
Visitors interact with the installations and the personalised, virtual content by using a handheld 4G/WiBro device into which they program personal details which are then used to configure the content they are exposed to. The handheld devices also provide dynamic maps of the positions of visitors in real time and can be used to browse through lists of exhibitors, products and embedded information about the product or information being used, which can then deliver a real-time information feed as a guide to the items selected or being viewed/experienced at the time. RFID tracking of individual visitors throughout the building is also used to build up unique profiles of the interactions of people as they wander through the pavilion. The device then stores a record of the whole trip and all of the related media content, ready for remote retrieval, via the Internet, at a later date.

Visitors can also engage in four different types of socially interactive experiences that result in alterations to the structures of the pavilion. In the middle of one of the floors of the installation, the hard kinetic pneumatic structure becomes a soft organic structure reminiscent of ONL's earlier Trans-Ports project. The interior skin of this area is composed of a point cloud of tens of thousands of programmable LEDs of variable densities in order to create a spectrum of effects for visitors ranging from low-res ambient qualities to high-res streaming text and graphics.

The four types of 'experiences', or 'game-play', offered in the interiors of the pavilion were derived from an analysis of Asian popular cultural entertainment and were selected to actively target different pavilion user groups. They are an action/shoot-em-up game, a social chat game, an adventure/mystery game and a strategy/board game, which are being developed with the help of Korean massively multiplayer, online role-playing games design companies to create dynamic and immersive team-based, as well as individual, social experiences.

The success of such highly social and interactive computer games (the Second Life game now has more than 3.3 million international 'resident' players online) seems to offer a compelling, popular precedent and model for spatially embedded and enabled social interaction, not just for the Digital Pavilion Korea but for social, interactive space design as whole.

The Digital Pavilion is an architectural hybrid between online multiplayer games and the new urban games that utilise GPS, GIS, RFID and wireless technologies (such as Geocatching and Noderunning). The question of whether this fusion of augmented reality with animate and interactive architectures will catch on as a new social pastime (a deep cross-programming of playing and shopping) remains to be seen.

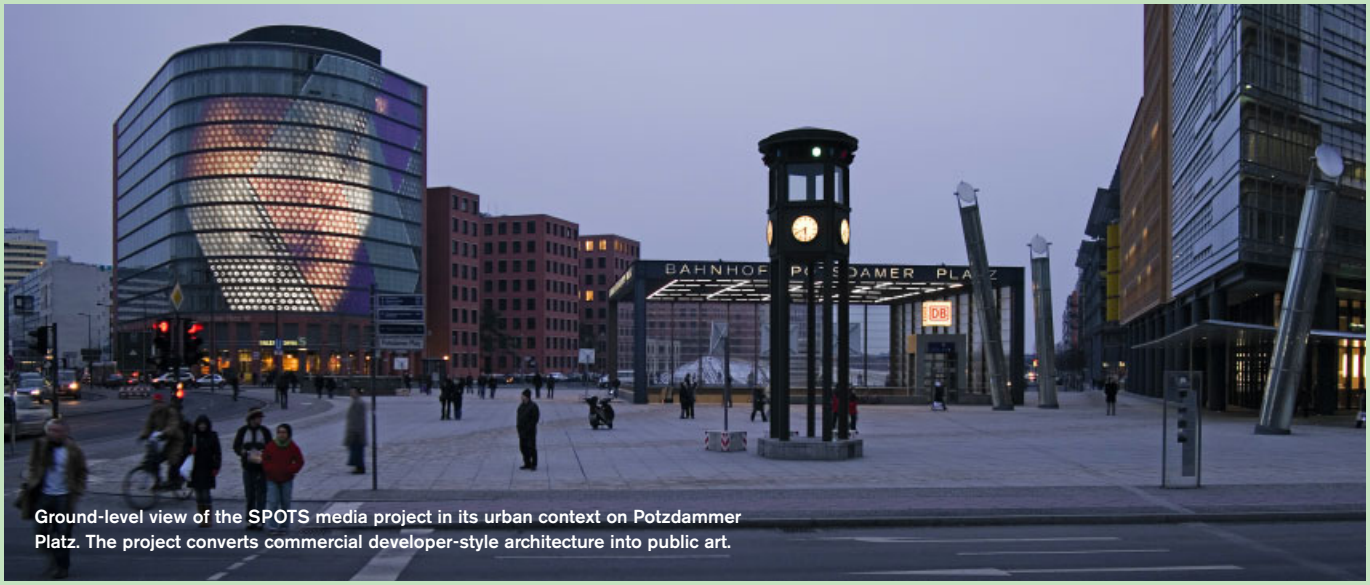


Exploded axonometric of the three floor plans showing the Voronoi cell-like structure of the building's tectonic system across each of its three storeys.

Digital image of the interior of the first floor. Made up of large, darkened, LED-backlit glass panels, the interiors of the first floor provide the perception of an infinite, media-rich or translucent space. This Postmodern fragmentation of space provides a kaleidoscopic experience of inhabiting an information-rich play-shopping crystal, a showcase for the South Korean government and entertainment and IT companies.

SPOTS, Berlin, Germany, 2005

Realities United



Ground-level view of the SPOTS media project in its urban context on Potzdammer Platz. The project converts commercial developer-style architecture into public art.

Standing in front of the Realities United SPOTS project on Potzdammer Platz in Berlin recalls the Archigram Instant City project as well as later film versions of giant, urban moving-image screens such as those which have now become stock clichés in science-fiction films like *Blade Runner* and, more recently, *Minority Report*. High-resolution screens such as in Piccadilly Circus in London and Times Square in New York are privately owned and controlled despite their dominating corporate presence in the world's most significant public spaces. More interesting are the buildings such as the Lehman Brothers' headquarters on New York's Seventh Avenue, which sports a multistorey wraparound screen across a number of the lower storeys on its facade. Sadly, though, almost all of these big public screens carry bad advertising that is mostly neither socially engaging nor at the very least aesthetically innovative. A more arts-based, democratic and populist driven content for media facades in more everyday urban settings seems more likely, however, with the launch of second-generation hypermedia skins such as the SmartSlab system by Tom Barker (www.smartslab.co.uk).

The hope afforded by these new types of more flexible, big-screen technologies is that we could all be producing and seeing more projects that come somewhere between SPOTS and the jumbotrons of Piccadilly Circus. The salient question here is more to do with whether we actually want such Las Vegas-like, Christmas-decoration style homes and streets in our cities all year round?

It seems a shame, then, that out of financial necessity, SPOTS – one of the world's few arts-content-driven, media-facade architectural projects – is such low resolution. But then pixel size is not everything. Realities United has certainly made the best of the site's limitations, and there is something poetic about this low-tech digital pointillism after all. SPOTS is dramatic in scale and fascinating in its non-intrusive simplicity and (despite its low-res nature and low-lux power) it is, as a project, arguably aesthetically superior to its high-res cousins. Its seductively self-conscious critical rejection of the full-power razzmatazz retinal circus that comes with the in-your-face high-res of jumbotron screens and its tailoring of public-arts content to the constraints and aesthetic opportunities of its low-res medium is certainly a significant and sensitive achievement in this field. This temporary installation should therefore be made permanent.

A development on their BIX media facade for Cook and Fournier's Kunsthaus Graz in Austria, SPOTS (one of the largest media facades in the world) is scheduled to be installed for 18 months (since June 2006) on 1,350 square metres (14,531 square feet) of the facade of a converted office block. Commissioned by the Café Palermo Pubblicità agency for the client HVB Immobilien AG, the screen is made up of a large-scale matrix of 1,800 conventional fluorescent lights installed into the glass curtain wall of the building. A single computer controls the entire system and can isolate and control the brightness of each individual lamp. Text and animations can be communicated across the facade and, unusually, the underlying architecture remains largely visible through the display. Realities designer Jan Edler locates the work precisely on the boundaries of 'the transitional zones between architecture, design, art and marketing. What we are doing is the continuation of architecture by other means.'[8] Which comes as no surprise considering its location in Berlin's cultural and commercial centre, alongside such enterprises as the Neue Staatsbibliothek, Neue Nationalgalerie, Philharmonie concert hall, German parliament and the headquarters of numerous multinationals.

Though the intention is clearly to market the city as a whole, the public nature of the work is explicitly stated by the designers who explain that 'the complex needs to enrich the city more than it exploits it … it needs to satisfy the proprietary interests of the owners and likewise the public's interest in the city and in having a functioning public space'.[9] As a result, the screen broadcasts an artistic programme six days a week, with only Mondays given over to advertising with which to finance the arts-based content.

With a maximum luminous output of 67,920 watts and a maximum 'image' refresh rate of 20 luminous intensity values per second, SPOTS is not a distinctly high-tech or technically advanced system. However, its thoughtful and carefully designed content means it knocks spots off of the high-res advertising that is digitally projectile-vomited out over the public in Times Square and Piccadilly Circus.

Moving giant faces are among the most striking and recognisable content of the public arts programme broadcast via this low-res digital-media facade. The grainy, digital Benday-dot pointillism of the media screen has a poetic and critical force that contrasts effectively with most of the commonplace high-resolution advertising screens that preside over many of the world's most important public spaces.

Colour by Numbers, Stockholm, Sweden, 2006

Erik Krikortz, Milo Lavén and Loove Broms

The multicoloured lighting system being controlled via mobile phone.

An even more minimal, low-tech, urban public-arts-based interactive-lighting project reminiscent of the work of Dan Flavin and James Turrell is Colour by Numbers in Stockholm. The project is located on the facade of a converted 10-storey tower, which used to house LM Ericsson's laboratory, the site of groundbreaking experiments with microwave technology. A slim, clear landmark in the local Stockholm cityscape around Midsommarkransen, the Ericsson Tower on Telefonplan has been refurbished by designers Erik Krikortz, Milo Lavén and Loove Broms with a multicoloured set of illuminated windows. The patterns and colours of the tower vary constantly in response to numerical SMS messages sent in by the public (an acknowledgement of the history of the tower), by mobile phone or via the Internet.

The designers are explicit about the public and social nature of the project: 'Inscriptions on a publicly owned area are judged differently from signs on privately owned areas. A billboard is in a certain sense an area for sending a message in the public space, but the person paying for it controls it. Private citizens rarely get the chance to send their messages high above the houses and subway, as now at Telefonplan.'[10]

Describing their project as a form of graffiti, the apologist for this project Charlotte Bydler (a lecturer in art history at Södertorn College and Stockholm University) is modest about its impact, effects and status, noting that the public 'can't use the tower for political or commercial purposes. What remains is a playful communicative process that takes over the public space as the colours change. The tower at Telefonplan sends out a message, and for most people the message is "art" … Colour by Numbers raises issues about what democratic architecture could look like and starts a critical discussion about city planning and the use of the public space.'[11]

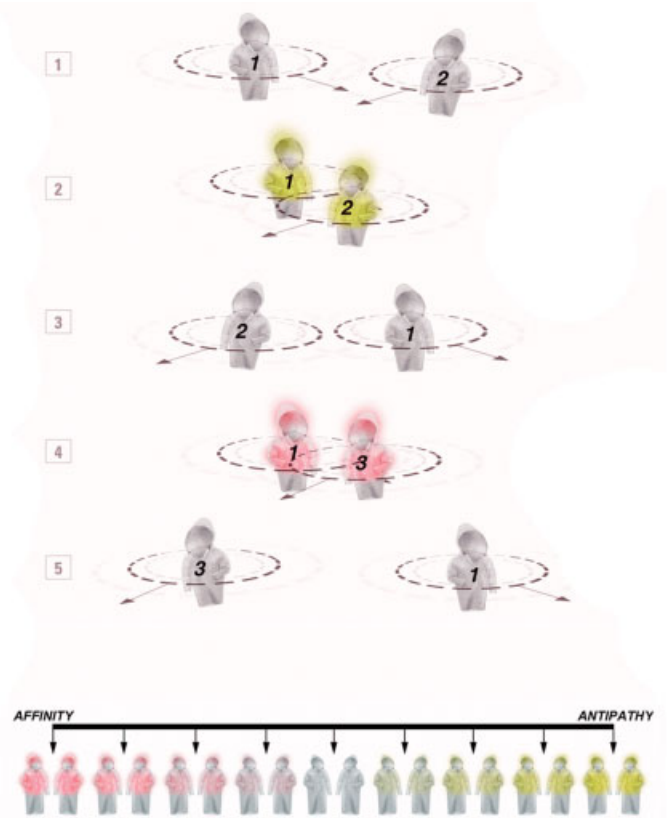
The sense of control in this project is intended to provide a sense of ownership. Though questions might be asked about its true social impact, about whether its low-tech systems really do count as truly interactive rather than simply 'responsive', and about for how long it is able to keep locals amused, there is no doubt that it is an improvement on what was there before. On this level the social benefits of this interactive work are purely aesthetic and fit one of the popular contemporary models of public urban art (supported by a mix of public and commercial interests) as a catalyst for regeneration.

Conclusion

While each of these four projects has undoubtedly produced new forms of poetic experience, the electronic epiphanies and techno-transcendentalism they inspire are complicated and unusual pleasures. Their 'newness' and 'strangeness' is especially compelling for those members of the public who are not exposed to interactive spaces and non-static, technologically enabled public art on a regular basis. The often low-tech, gadgety and low-budget nature of most of the projects also portrays an unfortunate aspect of this new trend in socially interactive design – the fact that this is a grossly underfunded area of research. Public bodies and research funding organisations are neglecting these types of projects in favour of less risky, less expensive ones, leaving rich multinationals to skew the capabilities of interactive architecture towards sometimes bland and barely disguised next-generation 3-D billboards and other advertising and promotional spectacles. What might a very (as opposed to a slightly) socially engaged architecture look like anyway? Is a more specifically targeted form of social engagement something these projects should or could aspire to? What might (for example) a socialist, Marxist or communist interactive architecture look like? Is (for example) a disabled, feminist, black, gay or African interactive architecture possible, or even desirable? Could interactive architecture work in the poorest residential districts of cities? Where are the critical, dissenting and interactive architectures that attempt to engage with poverty, war, bioethics, nuclear weapons, crime, drug abuse, disease, unemployment, the environment, human rights and other content?

If only corporations and public funding bodies would sit up and take notice we might all get off our sofas and, even if just for a while, enter a new type of social world.

Arguably the most sophisticated types of projects in this field are yet to be built: speculative projects such as Hooker and Kitchen's Electroplex Heights, and the work in schools of architecture where studios like Unit 14 at the Bartlett and ADS4 at the RCA in London regularly produce visionary and socially engaged architectural projects of the highest international calibre. But almost all of these 'research'-based projects remain sadly neglected and never see the light of day beyond end-of-year exhibitions and esoteric small-scale show catalogues. If only corporations and public funding bodies would sit up and take notice we might all get off our sofas and, even if just for a while, enter a new type of social world.



Diller + Scofidio, Braincoat, Swiss Expo, 2002
Diagram illustrating the range of possible response types across an affinity–antipathy spectrum in wearers of the Braincoat.

Whether these new worlds turn out to be more socially engaging for all of us is, as yet, too soon to tell. The most ambitious projects currently in development in this area (such as the Zaragoza Digital Mile, the multidesigner-based digitally interactive urban design project initiated by the city of Zaragoza for Spain's Zaragoza Expo of 2008) provide the opportunities to imagine that shortly, public projects will surpass the social powers of Ada or Braincoat. AD+

Notes

1. From Peter L Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, Anchor Books (New York), 1966, p 5.
2. Malcolm McCullough, *Digital Ground*, MIT Press (Cambridge, MA), 2004, p xiv.
3. Now Diller Scofidio + Renfro.
4. McCullough, op cit, p 20.
5. Kas Oosterhuis, personal communication, 29 January 2007.
6. Ibid.
7. ONL, Digital Pavilion Korea Vision Document, January 2007, p 2.
8. From www.spots-berlin.com/en.
9. Ibid.
10. www.colourbynumbers.org.
11. Ibid.