Playing with Art

During the last decade and a half, a revolution has been under way in London's public museums and galleries. Lucy Bullivant explains how the digital has emancipated institutions from their previous physical constrictions, enabling artworks to break out from behind glass and liberating artefacts from their sealed cabinets. The perception of permanent collections is being transformed, as visitors are encouraged to make new connections between objects and break down physical distances between separate gallery spaces. Another new level of interaction is being encouraged by specially commissioned installations that encourage the user to physically engage with art.

Line Ulrika Christiansen, Stefano Mirti and Stefano Testa (with Studio Ape), Tune Me, V&A, London, 2004

Museums are increasingly active microcosms of cultural life. Their accessibility has grown in the last decade and exhibitions of the outfits of style icons – Kylie Minogue at the V&A in 2007, Jackie Kennedy at the Met in New York in 2007 – or dating evenings are now part of their populist repertoire. It is their early adoption of digital media that has given them a golden opportunity to expand definitions of art, learning and above all, who makes culture, an opportunity the UK leaders in the field have seized with both hands.

The drive to broaden the museum-going public was made easier after entrance charges to all UK national museums and galleries were scrapped by the Labour government's Department for Culture, Media and Sport in 2001 after a lengthy lobbying campaign. Tate Modern, which opened in 2000, has been such a runaway success of this open-door policy, achieving 4.1 million visitors a year, that it is now building an extension to accommodate the diversification in visual arts media as well as provide more cafés and shops for its expanding audience. This upsurge is not just physical – it is mirrored by a growth in the use of Tate Online, the Tate's website, which from 2004 to 2006 received a 56 per cent increase in traffic.

For their audiences museums compete with all forms of public entertainment providers, a key factor in the incremental shift in definitions of their role as custodians of cultural authority over the last 15 years, illustrated by the innovative proactivity of Tate, the V&A, the Science Museum and others in the evolution of handhelds, multimedia catalogues of art, and interactive installations that colonise galleries. This move to a more hybrid museum and gallery culture can be set in the wider contextual reality of the mediating impact of digital technology as a proliferator of means to learn and a customiser of content. Playing games as a means to mastery has seemingly become a ruling cultural *modus operandi* across all sectors.

By encouraging content to be customised, and art to be mediated, museums have precipitated new paradigms of informal learning and reinforced the widespread value of their public spaces as places to freely explore the personal significance of cultural value. Exhibitions using interactive elements have moved on from being hermetic, to adopting physical, experiential tactics and strategies based on the testing of visitors in their use of interactive and audiovisual elements. Event-based artworks such as Carsten Höller's Test Site, installed in Tate Modern's Turbine Hall in 2006, focus on what Höller calls the 'inner spectacle' of delight and anxiety of sliding experienced by the more intrepid visitors who elect to hurtle down his giant spiralling tubes.

The tools and the narratives now being applied by curators to amplify themes more closely both reflect and test wider cultural activities in society. In their use of digital media, participatory installations draw on longer established forms of popular culture archetypes that require physical involvement. Why make a video game playable just by pressing a button? Why not make it physically manipulable by riding a bicycle?[1]

Works parallel, mirror and build on media, old and new. A new cultural symbiosis in digital media intentions has emerged as curators actively draw from the ways in which people are already trying to develop the role of digital technologies in their lives and harness the potential they now enable for user-generated content.

By informalising their environments through innovative programming and a wider use of digital technologies, the most forward-thinking museums are addressing their rich potential as public spaces and overcoming the proprietary associations of their institutions as guardians of cultural authority as a given. The curatorial voice is still present, but the curator now acts far more as an enabler of a wider range of viewpoints and perspectives on the art being presented, which is not a static phenomenon in any case. Even a painting on a wall can now be technologically mediated. Introducing interactive works to museums and galleries raises audiences' expectations. When they work well they can be extremely popular, regarded by all ages as valuable and fun, informal educational tools, helping to broaden visitor's notions of what art – as well as the spatial identity of the institutions with responsibility for its wider mediation – can be.

The museum sector has regarded digital media as a vital weapon in advancing its public service ethos. Innovation in new resources in this field was spearheaded by the National Gallery's Micro Gallery, launched in 1991 in time for the opening of the Sainsbury Wing designed by the multimedia consultants Cogapp,[2] which immediately became regarded as a benchmark of its kind internationally. A highly effective tool for understanding in the form of a multimedia hypercard stack catalogue of the paintings with interpretative text, it was easy, responsive, fast to use – and fun. 'It encourages you to explore, to play and thus make new connections and gain new insights,' said one commentator.[3]

Eleven years later, in 2002, Tate won two BAFTA Awards for its own groundbreaking digital media adoptions. I-Map, created by Caro Howell, Special Projects Curator at Tate Modern, and Web author Daniel Porter, was the first Web-based resource for visually impaired people. It incorporated text, image enhancement and deconstruction, animation and raised images. The Multimedia Tour (July to September 2002), by contrast, was the first pilot project in the UK to use wireless technology to deliver content – videos, still images and text – to museum visitors. Developed by Tate Head of Interpretation Jane Burton in association with Antenna Audio, it enabled visitors given a wireless handheld computer to see videos and still images providing additional context for the works on display, or listen to an expert talk about details of a work that were then highlighted onscreen. Interactive screens encouraged them to respond to the art on view, for instance by answering questions or by layering a collection of sound clips to create their own soundtrack for a work.

Multitracking with the pilot's handheld was easy: visitors could record their own messages and create their own soundtracks to specific works, and the content of prepared

Jason Bruges Studio, PSP Image Cloud, V&A, London, 24 February 2006
An unconventional form of chandelier was suspended from the ceiling of the V&A's main foyer for the one-night-only Friday Late event. By splitting the video data from a Play Station console, Bruges enabled the 50 small TFT screens hanging from the ceiling to screen changing content fed up from it. This took the form of bespoke animations, but also visitors' own video material and games, giving the power to orchestrate the visual appearance of the space.

messages was there to be chosen from, not imposed. A porno-movie style soundtrack by the Chapman Brothers inevitably entertained some visitors but alienated others. According to the Multimedia Tour focus group findings, a message about Damien Hirst's *Pharmacy*, which used a 360-degree panorama of the installation as the interface for audio messages about the work, including interviews with the artists and a pharmacist, was particularly popular. Now this form of 'free choice learning' via handhelds is much more common, and virtually every major or middle-sized art museum in the world at least has an audio guide for its permanent collection, often in several languages, and many use MP3 players or PDAs. The Tate's Multimedia Tour pilot has galvanised the future development of handhelds. Its impact also supports curatorial interests in letting visitors absorb ideas and connections at random, based on their own personal interests.

The advance of museums and their relationship with art has also broken down boundaries between museums and galleries and the outside world, leading to institutions placing faith in the kinds of social evenings involving one-night-only installations that five years ago would have been customary only in nightclubs, private firms or galleries. A form of cultural club night with DJs, these events have not only nurtured new audiences, but transformed assumptions about art and design. In 2003 the V&A created the atmospheric Friday Late events, a regular series of evenings featuring live performances, guest DJs and hands-on art and design activities, and a bar in the public areas, with a sequence of some of the institution's main ground-floor galleries made open to visitors. A focus on the communal has gone hand in hand with a greater focus on the live event. The Friday Late transvision held on 24 February 2006, staged by the V&A with digital video festival directors and producers onedotzero, featured motion graphics, music videos, interactive installations by Jason Bruges Studio, Neutral, AllofUs, D-fuse, Usman Haque, United Visual Artists (UVA), the Light Surgeons and others, specifically 'to extract new meanings from museum objects and lead you through familiar and unfamiliar environments'.

If the curatorial agenda is spurring active visitor participation, it is appropriate as well, given the improvisational nature of the context, to include art engaging play or a form of 'mixing' (to use the musicians' verb). It was at one of the Friday Late evenings that Jason Bruges, an architect who has been responsible for more cutting-edge spatial interactive works for major British museums and galleries than any other individual, created PSP Image Cloud, an interactive 'chandelier' with an organically arranged array of 50 small TFT screens dangling from it in the museum's main foyer close to the DJs' turntables. Emitting a constantly changing environmental aura, it introduced into the museum the leisure-based technologies of Sony Play Station (promoting the firm as sponsor and facilitating manufacturer of artistic works). As an installation Image Cloud defied any division between rarefied museum environment and a domestic living room. Bruges hacked a portable Play Station console, and created bespoke video content that he fed into a computer, where Isadora software split the signal into components through multiple outputs up to the chandelier. Visitors were encouraged to upload their own video material and content to the PSP controlling the chandelier and experience their control of the environment through the work.

'We designed it to be accessible to an audience that may not normally engage with architecture and design in such a way,' explains Bruges. 'We overlaid the language of gaming on to the piece in the same way that Phillips AMBX technology would, utilising the idea that your gaming environment can bleed on to the environment near you. You could upload texture and mood from your PSP on to the chandelier in very much the same way you can customise your environment with something like Quake.'[4]

Another playful work commissioned by onedotzero for the V&A Friday Late transvision evening gathered visitors in the decoratively panelled 18th-century Norfolk House Music Room of the museum around a glowing table. Plink Plonk, created by digital design consultants AllofUs, used small mechanical musical boxes as playful input devices. Producing their own sound output (the tune 'You are my sunshine'), they could be moved around the table, provoking different visual narratives to respond by producing sound-reactive effects, including a glowing star scene, water drops and a sun that grew and gradually disappeared leaving a total eclipse.

Not only do interactive installations shift cultural satisfaction away from solely the static and untouchable, but as Lauren Parker, Curator of Contemporary Programmes at the V&A, where digital media has been utilised since 1999 when the contemporary programme was founded, remarks, it adds a different level or layer of communication that acts as a 'hidden colonisation' of galleries.[5]

AllofUs, Plink Plonk, V&A, London, 24 February 2006
Like an interactive board game, this installation, in the Norfolk House Music Room at the Friday Late transvision evening, had people clustered around a table. On its glowing surface they could play with small sound-input devices disguised as mechanical musical boxes. Moving them around the table provoked a range of decorative, sound reactive light effects.

UVA, Volume, V&A, London, 2006–07
Situated in the Italianate courtyard of the museum for a period of months, 46 2.5-metre (8.2-foot) columns form a grid of LED lights rigged up to an audio system, computer and separate synthesiser network for each column, which plays its own piece of music. Walking up to it increases the volume; no movement deactivates it. This simple system of rules generates complex emergent patterns as the number of people increases. The arrangement each person hears depends on his or her path through the installation, as well as the movements of the people around the individual.

Claire Wilcox, the V&A curator responsible for the 'Radical Fashion' exhibition in 2001, commissioned musician David Toop to create a collage of digital musical tracks by 12 different composers, setting a precedent at the museum for sound to intimately support the meaning of an exhibition. 'Shh! ... Sounds in Space' (2004), which Parker curated with Jonny Dawe, was not an exhibition but a personal journey that visitors embarked on through galleries of their choice, featuring a series of tracks written by artists including Jane and Louise Wilson, David Byrne, Roots Manuva and Elizabeth Fraser for particular spaces, galleries or exhibitions. Visitors were simply given a set of headphones and an MP3 player with recordings of the sound works before they set off. Trigger locations rigged up with an infrared transmitter would alter the volume, or cause a repeat or even the end of a piece. This enabled visitors to have personal, unmediated experience as well as individually chosen routes through the galleries, though complementary to those of other visitors, which could be shared on completion. While Fraser, known for her melodic singing voice on tracks by the Cocteau Twins and Massive Attack, chose the cathedral-like space hosting

the Raphael Cartoons, Cornelius, the Japanese composer, sited his electronically experimental music in the hushed enclave of the Glass Gallery.

The most recent and highly successful interactive installation in the Italian courtyard of the V&A, as a museum built in 1909 to a design by architect Aston Webb, has been Volume (2006–07), designed by UVA with sound by the band Massive Attack: 46 2.5-metre (8.2-foot) high columns that are in fact a grid of LED lights that form an 'orchestra' with modulated colour to match the changing mood of the overall piece. A digital camera with its own image-processing computer, placed high up in the courtyard, analyses the installation and figures out where people are. Walking up to a column increases the volume of its sound; walking away decreases it. If a visitor stopped moving for long enough, he or she became invisible and the column deactivated until they moved again. 'The arrangement you hear depends on your path through the installation, as well as the movements of the people around you,' explains Ash Nehru from UVA. 'It was important that the installation work as an experience on different levels.' Nehru calls it responsive rather than

Christian Moeller, Particles, Science Museum, London, 2000
One of the first works by German-born Moeller, this projection creates silhouettes of observing visitors in the form of glowing, animated particles they can manipulate to move around the screen and change in an ongoing relationship between this technologically mediated space and the people visiting.

Tessa Elliott and Jonathan Jones-Morris, Machination, Science Museum, London, 2000
A giant banded computer screen above visitors' heads responds to their presence by interpreting it according to what it has in its memory, transmuting details into other associated objects from its neural network of domestic objects.

interactive: 'The design goals do not require that people understand the interaction model.' Physical reactions ranged from the reserved to the exuberant, trying to see what elicited a response, and people negotiating each other's space.

Jane Burton at Tate agrees that digital media is encroaching on the otherwise reserved physical world of museums. Lauren Parker points out that 'what technology is doing is enabling visitors to have individualised and more intimate experiences of museums – from audio and PDA guides, to Podcasts, to the use of RFID tags to personalise their journey through the museum'.[6]

Hannah Redler, Curator of Art Programmes at the Science Museum, also sees the potential of communal, digitally enabled experiences in museums, and argues that the coming of RFID or Bluetooth-enabled, locative pervasive technology is enabling a form of augmented reality, and moreover a seamless relationship between specialist and nonspecialist content. Networking culture, she believes, has spearheaded a growing focus on a multiplicity of voices, pushing dialogue and discussion to the forefront of art and design displays. 'Everyone is making their own media now, in control of their own data,

while subject to huge systems of control,'[7] she adds. She is aware that the challenges mounted by visitors to museums require curators to create robust internal editing processes now we all have a hand in constructing visitor experience. 'Scientists and artists layer different data sets, generate, order and use data and build complex relationships between data, but so do laypeople. Static information is dead,' she says.

The Science Museum in London was one of the earliest UK adopters of audience-focused information technology, interpreting content and communicating stories, but it has, like all of the best science museums, had an interactive – albeit more low-tech – approach to exhibition design since the 1950s when visiting children would find themselves invariably pushing buttons or turning dials. In 2000, Redler commissioned a group of new artworks for the Science Museum for a new display called 'Digitopolis'. With an overall design by Casson Mann, it examined the ways digital technologies were affecting human experiences of the world, and included Christian Moeller's Particles, a swarm of glowing animated particles projected on a screen creating a silhouette of the visitor in front of it in motion. Machination, by Tessa Elliott and Jonathan Jones-Morris, was a giant computer screen with a poetic impact that interpreted what it saw of passing visitors according to information in its custom-designed 'neural network' of domestic and decorative objects. It searched for a resemblance in its memory, thus a hand placed on the hip was relayed visually as a china cup, and the weave of a jacket as the edge of a bird's wing.

'Early interactive design really drew on the real world. To do something in the early 1990s that was an interactive display, a designer had to be a software coder, while Hypercard wasn't that accessible,'[8] observes Redler, who had her own interactive design company before becoming a curator. At this point, 'most of the small companies consulting in the field engaged a mix of people good at coding, and others who were good at graphics and animation,

Energy Ring, Energy Gallery, Science Museum, London, 2004
Above and right: The 40-metre (131-foot) long Energy Ring, a suitably
Newtonian symbol announcing the permanent Energy Gallery (designed by
Casson Mann), was a white LED screen wrapped and mounted in a 13-metre
(43-foot) aluminium circle to form a suspended ring of dynamic white light.
Four interactive terminals in the adjacent gallery, with software designed by
AllofUs, allowed visitors to send their own responses to questions on energy
to be displayed on the ring's screen, for which Soda, another consultancy,
designed the text display software. They could also 'zap' the ring from their
touch-sensitive screens, causing it to emit small flashes of light. It was a
classic of its kind: large-scale, simple and with high production values, yet
capable of engaging people at terminals in the gallery itself.
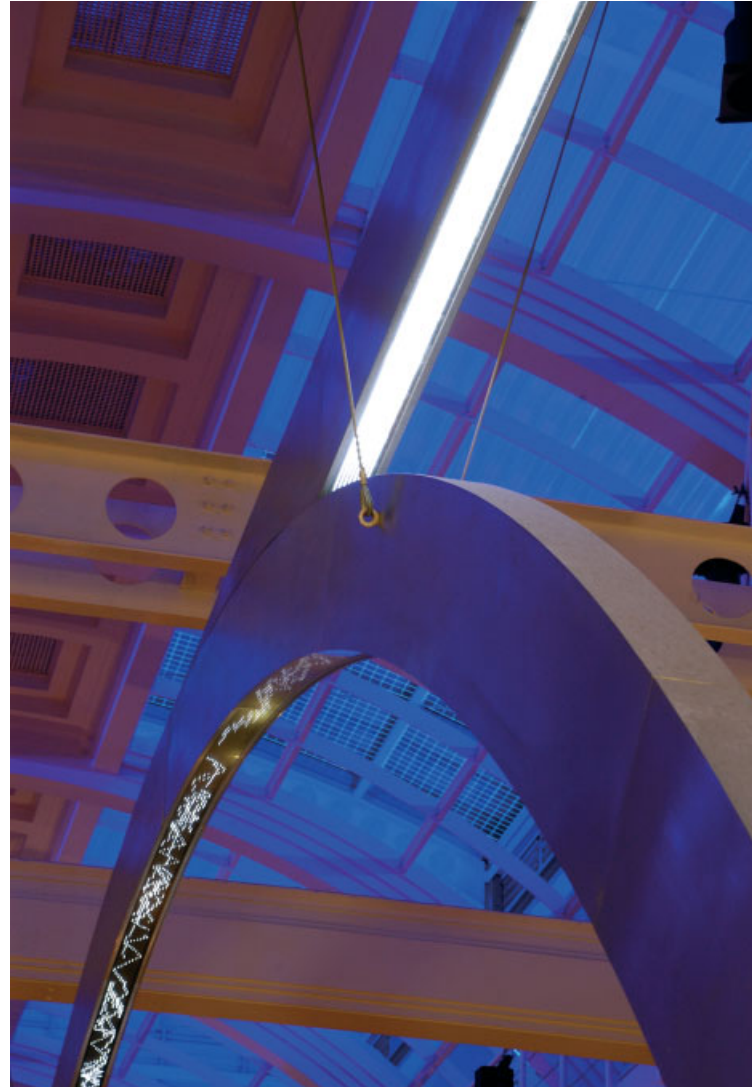
but the early interactive installations they made conformed to
a certain orthodoxy in terms of where the buttons went.'
Specialist courses in interactive design started to emerge such
as the multidisciplinary MSc course in the subject at
Middlesex run by artists John Latham and Tessa Elliot with a
team of computer scientists, interaction designers, human
factors specialists and product designers.

In museums, as new interaction projects began to be
written in Director script, more research went into content
and scripts. Interior design by specialists such as Casson Mann
was introduced to structure results. As interactive exhibits
became successful in going beyond the screen, a more
compellingly experiential breed of interactive installations
emerged that brought people together on a physical level in a
more spontaneous way. Curators like Redler advocated
'stealth' learning, so that in order to become better
acquainted with concepts, they engaged visitors in physical
activity rather than gathering them passively around a kiosk.
The Energy Shutdown installation in the interactive Energy
Gallery, curated by Redler and designed by Casson Mann,
which opened in 2004, exemplified this mix of aspiration for
intellectual stimulation and physical activity. Designed by
Kitchen Rogers Design (KRD) and Robson & Jones, it was a
four-player table-top digital interactive exhibit with a 3-D
model cityscape. The game was based on the challenge of

**Kitchen Rogers Design (Shona Kitchen and Ab Rogers) and Robson &
Jones (Crispin Jones and Dominic Robson), Energy Shutdown, Science
Museum, London, 2004**
This was an interactive exhibit for four players in the permanent Energy
Gallery. When visitors approached, they found a flat surface that transformed
into a rising 3-D model of a cityscape but then experienced a power cut when
all the lights on it switched off. The players had to complete a series of
games to help engineers restore power to the city, and reignite the lights.

Fairground: Thrill Laboratory, Dana Centre, Science Museum, London, 2006
Curated by Brendan Walker, this interactive installation in place on specific days over a two-week period was based on three classic fairground rides: the Miami Trip, the Ghost Train and the Booster. During the day, before the rides were open to those with tickets, visitors entered a competition and the winners were eligible for the ride, for which they had to be hooked up to monitoring devices to collect data that was beamed around the room in the form of telemetric ride projections for audiences to see.

restoring energy to a city under blackout, which would zap back into life when the power returned.

Interactive installations are frequently based on gaming technologies or games of a more traditional kind, creating a kind of museum 'theme experience' with various related activities to take part in. Fairground: Thrill Laboratory (2006), curated by Brendan Walker for the Science Museum's Dana Centre, drew not upon computer games, but classic fairground rides like the Miami Trip, described as 'a party in motion'. The ride was a classic marriage of technological innovation and popular culture for audiences ready for a gravity-defying, carnivalesque thrill. Only lucky winners of the Thrill-Lab-Lotto braved the rides, whereupon they were initially hooked up to monitoring devices capturing physiological data and facial expressions. These were then beamed around the walls of the museum's lab via a wireless telemetric projection system for audience analysis.

Works also appeared in other, everyday parts of the museum, for instance sound artist Scanner (Robin Rimbaud)'s Sound Curtain (2000), which visitors discovered as they passed through the lobby area of the ground-floor toilets. Here, sensors hidden in the ceiling triggered a series of amplified sounds integral to everyday life yet scarcely registered, including the humming of a light bulb, the pulsing of sunlight or blood rushing through the human body.

Being able to sense a space more profoundly as a kinesphere is one of the chief benefits of interactive installations. Jason Bruges' Anemograph (2006), a work commissioned for the main entrance area of Sheffield's Millennium Galleries and designed to last for two years, is an artistic seismograph of changes in the weather. Its changing nature breaks down the visitor's sense of the boundaries between internal and external space as 25 balls made of polyethylene suspended in transparent acrylic tubes at the end of a long walkway gently fluctuate in height according to the speed and direction of the wind blowing outside. LED lights illuminate the colour of the balls according to their height. It is the first time the museum has commissioned an installation of this kind using light, and will also act as a wayfinder as well as a catalyst for spontaneous responses. 'While the word "interactive" can raise expectations', says Kirstie Hamilton, Head of Exhibition Programming, 'the interactive aspect of the work needs to be integral to it rather than additional.'[9]

Now that museum educators have more than 15 years' experience of realising interactive installations, and public assumptions about multimedia's role in society are constantly advancing, these new paradigms can be drawn on in a more sophisticated way. As interactivity becomes par for the course as a presentation tool, museums must demonstrate that they have the means to amplify themes readily yet imaginatively via intuitive uses of interfaces, or visitors will not pay attention.
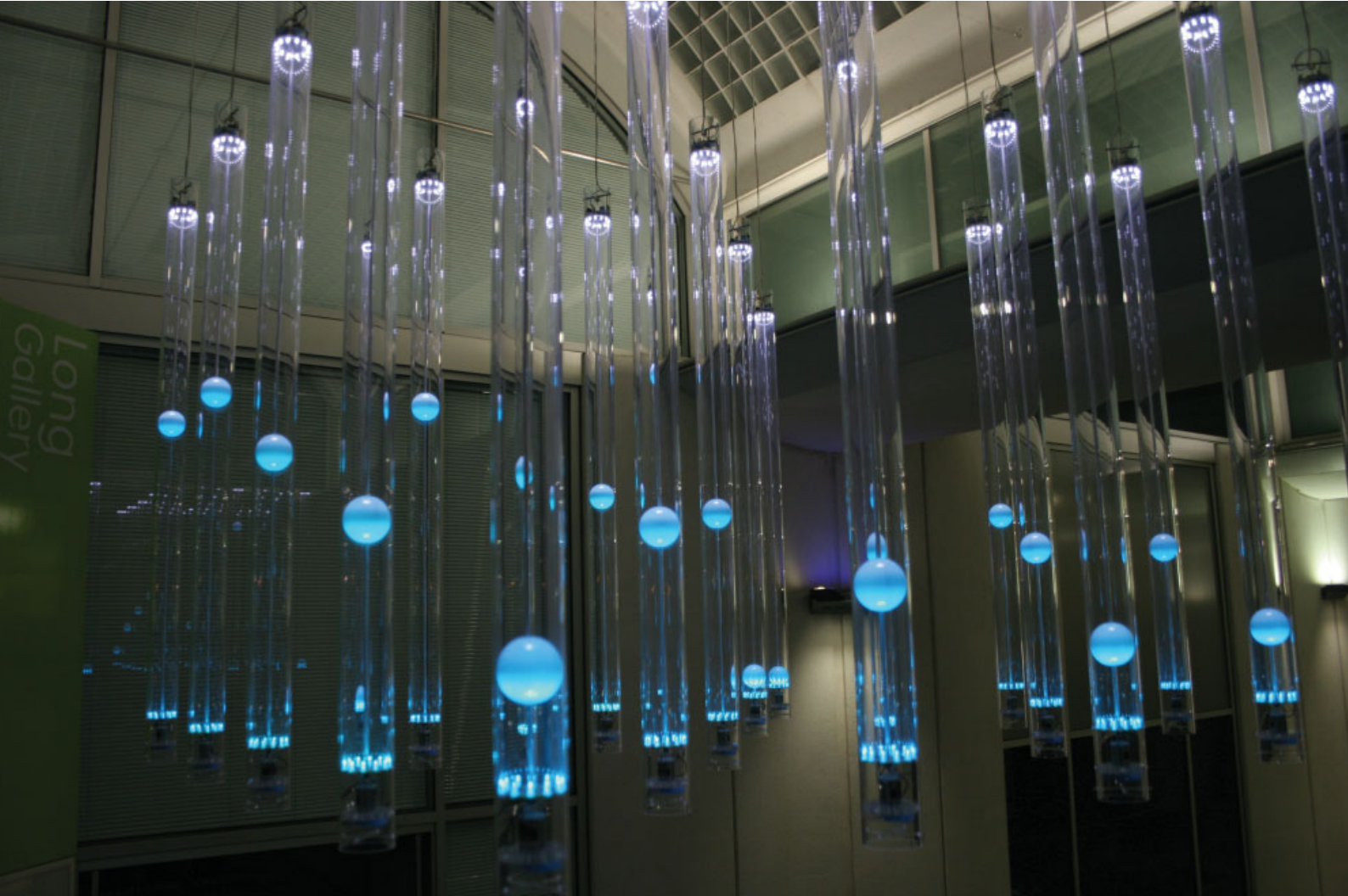
Jason Bruges Studio, Anemograph, Millennium Galleries, Sheffield, 2006
In this suspended interactive work responding dynamically to changes in the weather, balls suspended in acrylic tubes rise and fall depending on wind speed and direction. In turn, their changing height triggers LED lights to glow more brightly.

The V&A's 'Touch Me' exhibition (2005), a collaboration with the Wellcome Trust attended by 25,000 visitors, was a bold attempt to present a range of designs that engage with the touch senses, many via unexpected narratives of use. Around 80 per cent of the exhibition was touchable and included some surprising sensory experiences. By pushing on the Drift Table, and looking through a peephole, visitors could feel as if they were floating over the English countryside. Intimate Memory clothes by Joanna Berzowska of XS Labs (see also Despina Papadopoulos's essay on wearable computing in this issue) betrayed evidence of a whisper or a grope. And Tomoko Hayashi's Mutsugoto/Pillow Talk was a device to communicate in a more personal way long-distance messages to a lover lying on his or her bed far across the world. This required a bit of bodily organisation, as the message was relayed effectively only when the visitor's body, lying on a bed in the exhibition (having taken his or her shoes off), matched the alignment of his or her lover's silhouette.

One of the most ambitious installations free of such ritual at Touch Me was Tune Me, a screened immersive space designed by a leading group of Italian designers working in the Exhibition Unit at the Interaction Design Institute Ivrea,

who now work together in Turin as a practice – the Interaction Design Lab.[10] Inspired in part by multisensory therapy rooms designed for use by the visually impaired, deaf, blind and people with learning disabilities, it was a conceptual radio set in an egg-shaped double-layer shell to create the Faraday effect of preventing other frequencies entering the space. The radio was activated by touching silicone areas in the seating bathed in coloured light, over which long strands of tactile fabrics hung. Each interaction triggered a different experience through a pulsation from the surface of the seating.

This was an intuitive and engaging interface. Line Ulrika Christiansen of the Lab explains that people warmed to it as it was free of direct commands or buttons to press.[11] Changing the radio's channel by physical touch altered the light, sound and vibrational qualities of the overall space, creating different moods. The lighting could be adjusted to suit the tone of the FM station discovered. Although perhaps erring a little on the side of ambient without a wider application of usage, Tune Me enabled visitors to have exploratory experiences of touch as well as of the other senses, including, for this reason, people with a form of visual impairment, which was a plus. Visitors making brief visits sensed the effect of the light: more time

AllofUs, Grid, Constable exhibition, Tate Britain, London, 2006
This was one of two interactive exhibits at the exhibition using conservation x-ray techniques that illuminate an artist's working methods. The visitor's presence in front of a painting casts a shadow over it, revealing an x-ray of paint layers beneath. In this case, she can see Constable's process of 'squaring up', or starting with a small pencil sketch and ending with a 1.8-metre (6-foot) oil painting.
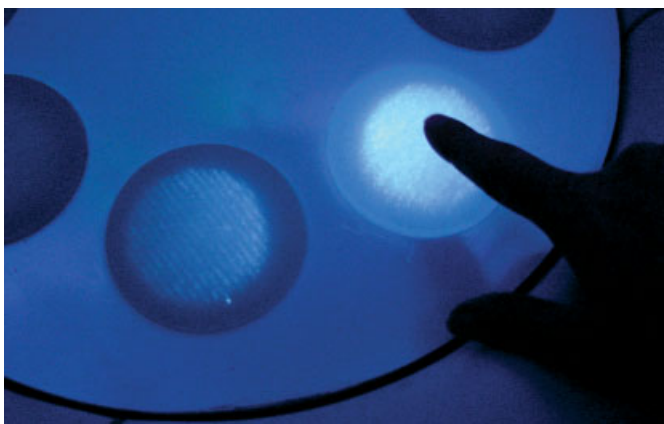
Line Ulrika Christiansen, Stefano Mirti and Stefano Testa (with Studio Ape), Tune Me, V&A, London, 2004
An immersive interactive installation at the museum's 'Touch Me' exhibition, this womb-like ambient space was based on therapy rooms for the visually impaired, and designed as an immersive 3-D radio that reacted to the visitor's touch and stimulated the sonic, visual and haptic senses through pulsations.

was needed to engage with the sonic and haptic senses. Above all, people could engage in a non-didactic way in understanding something Parker describes as having been 'neglected in so many products. Even with the newest electronic gadgets, the interaction is often primitive, brutalised, reduced to the prod of a screen or the tap of a keyboard.'[12]

The V&A's 'China Design Now' exhibition (to be staged in 2008) will feature online gaming, chat rooms, foot massage machines and a gaming parlour, establishing a smooth interdependence between physical spaces and virtual tools. While this has become an established practice, the active participation enabled by interactive technologies also allows visitors to more conventional art exhibitions to 'deconstruct' layers of the surfaces of artworks in order to better understand them. This virtual presentation of the work renders it a playful tool, a medium to enlarge interpretation of the art medium it is symbiotically entwined with. At Tate Britain, AllofUs created two interactive exhibits based on the conservation techniques already being used to analyse an artist's methods for the museum's major Constable exhibition (2006). By merely walking in front of the projected painting, the visitor casts a virtual shadow over the image, revealing a conservation x-ray of the painting underneath. The movement is the interface. A second installation, Grid, illustrated Constable's process of 'squaring up' an image in the journey from early sketches to finished work.

The evolution of sophisticated immersive experiences at one end of the scale is being matched by the policies of museums and galleries to honour their environments as public spaces for a wider social demographic, making them not just more family friendly, but developing new identities for galleries as participative art workshops. Interactive installations in their own right are not going to forge a more spontaneous environment in which social behaviours become more diverse, but rely on curatorial strategies to bring about alternative ways of thinking about museum space.

Jason Bruges Studio, Dotty Tate, Tate Britain, London, 2005
In the Octagon, 25 2-metre (6.5-foot) tall interactive wands with glowing spheres at their top turned only when touched. Bruges made a 'live painting' tracking the patterns of audience Interaction during the day.

Tate has hybrid educational resources that do this. At Tate Modern there is a new Learning Zone designed by Ab Rogers Design, a playspace made up of geometric structures in red fibreglass equipped with a range of interactives including touchscreen documentary film footage, games and quizzes on art. Tate Britain's Art Trolley, a mobile art unit on wheels equipped with a variety of materials, which sits in the middle of the gallery space near the artworks, was in fact first introduced 10 years ago. Frances Williams, Curator for Informal Activities at Tate Britain, says 'visitors not always approving responses' to this intervention 'speak so loudly about relationships towards "correct behaviour" and authority'. Yet when special days, such as BP Saturdays, are designed with drop-in workshops and interactive displays, they offer 'the possibility to experiment with different forms of social relationships to art and the environment in which it is usually shown'.[13]

Williams commissioned Jason Bruges to create a bespoke, one-day interactive installation in the Octagon, the central domed space in the middle of the Duveen Galleries. She knew that children are as affected by architectural space at Tate Britain as they are by any individual work of art, and this sometimes leads to them, and adults, feeling intimidated. Addressing an overall theme of Dottiness centred on looking for various circular motifs in works of art and in the gallery environment, Bruges made a minimal 'field' of blue LED lights set atop 25 plastic poles set 1.5 metres (5 feet) apart and

attached to the floor by vacuum suckers. As families passed through this space, they were able to touch the 'stalks', causing them to light up and gently oscillate. This movement was caught on a camera set up on the bridge above the gallery. Visitors could watch the motion their movements had created on a live monitor set up at the side of the gallery.

A mimetic work that engages touch, something that is usually prohibited in the rest of the gallery, Dotty Tate was, as Williams describes it, 'not only a "friendly" work of art that responded to being touched: in fact, it was its entire reason for being there and it would only "come alive" upon contact'.[14] She observed the particular ways in which children interpreted the piece. Many spent time watching to see how the poles worked before making their own use of them. Some children devised rhythmic games involving one or more poles to create patterns between each other. Others used them to test the limitations of the technology; how far the poles would bend, how securely they were stuck to the floor, how much violence they could withstand.

Its concept echoed that of another one-day, site-specific work Bruges created for Tate Britain that filled a gallery with 2,000 helium balloons tethered to the floor by different lengths of ribbon and light weights, with LED lights that sparked as people tested out the light patterns, giving it an unusual spatiality to be negotiated. With the day's educational theme of Fireworks, the work explored what it would be like, spatially, to have exploding light. Children's

Jason Bruges Studio, Sparkle Park, Tate Britain, London, 2006
A one-day installation in the form of a cloud of tethered interactive balloons with LED lights on their strings that sparked.
The concept here was to capture the patterns of the sparks, and as children attempted this their movements were
mapped on to a global projection as a thermal image visualising the layer of heat the whole proceedings had emitted.

movements investigating this were mapped on to a global projection, becoming one overall thermal image revealing a layer of heat over the installation.

It remains unclear how the further imaginative fusing of digital and analogue space will continue to reconstruct the social model museums and galleries represent as places of cultural authority towards one of a more participative nature. They are evolving into places where the active 'leisuretainment' of visitors, if not on a 24/7 basis then daily over a full 12-hour period, is a primary consideration. As public spaces of a particularly 21st-century kind offering both communal and individualised experiences that enjoy private-sector sponsorship, and even as social laboratories, they are attractive as they are so manipulable – unlike the wider world. However, they remain democratic places of free choice learning. Visitors are becoming attuned to touching exhibits, and this use of the senses for cultural stimulation may be on the rise. But observation in a museum or public gallery just by tuning into one's personal senses, turning off the stream of increasingly prosthetic handhelds' user-generated messages, and free of the need to add commentary of one's own to a public resource, is still also possible. ∆

Notes
1. A travelling exhibition on physics designed by AllofUs for the Science Museum and the Institute of Physics, 2005.
2. The trading name of Cognitive Applications.
3. 'The Sonic Hedgehog's Guide to Art', in *Museums News*, May 1993.
4. Interview by the author with Jason Bruges, 20 September 2006.
5. Interview by the author with Lauren Parker, 15 December 2006.
6. Interview by Line Ulrika Christiansen in *idCAST* online magazine, Interaction Design Lab, Turin, January 2007. www.interactiondesign-lab.com
7. Interview by the author with Hannah Redler, 28 September 2006.
8. Ibid.
9. Email interview by the author with Kirstie Hamilton, 1 October 2006.
10. Designed by Line Ulrika Christiansen, Stefano Mirti and Stefano Testa with Daniele Mancini and Francesca Sassaroli, and soundscapes by Rafael Monzini. These designers left the Interactive Design Institution Ivrea after its dissolution in 2005 and together established the Interaction Design Lab in Turin, Italy.
11. Email interview by the author with Line Ulrika Christiansen, 1 February 2007.
12. Lauren Parker and Hugh Aldersey-Williams, *Touch Me* exhibition guide, V&A (London), 2005.
13. Interview by the author with Frances Williams, 20 December 2006.
14. Ibid.