



3DVisA Bulletin

Issue 1, September 2006

3D Visualisation in the Arts Network

www.viznet.ac.uk/3dvisa (URL PENDING)

- ▶ **JISC 3D Visualisation in the Arts Network**
by Hugh Denard
- ▶ **Editorial** *by Anna Bentkowska-Kafel*
- ▶ **Message from JISC** *by Andy Wistreich*
- ▶ **Featured 3D Method** *The Artist Christian Nold Talks to Anna Bentkowska-Kafel about BioMapping*
- ▶ **Featured 3D Project** *OAKLAND BLUES. Virtual Preservation of Seventh Street's 1950s Jazz Scene by Yehuda E. Kalay and Paul Grabowicz*
- ▶ **3D Resources** *PHIMAI, THAILAND. A review by Michael Greenhalgh*
- ▶ **News and Events**
- ▶ **Who's Who in this Issue**
- ▶ **URLs included in this Issue**

Edited by Anna Bentkowska-Kafel

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JISC 3D Visualisation in the Arts Network

by Hugh Denard

The 3D Visualisation in the Arts Network was established in May 2006. 3DVisA is part of the UK Visualisation Support Network funded by the Joint Information Systems Committee (JISC) and hosted by King's Visualisation Lab in the Centre for Computing in the Humanities, King's College, London.

The Network exists to support those interested or actively engaged in the creation and use of digital 3D visualisations in Arts and Humanities contexts by conducting targeted research, creating opportunities for community-wide debate of key issues, widening understanding of methods and standards, and facilitating the exchange of skills and knowledge.

3DVisA comprises Richard Beacham (Director) and Hugh Denard (Director and Manager) Anna Bentkowska-Kafel (Research Fellow) and Julie Tolmie (Network Development Officer).

The launch of the Network at the Digital Resources for the Humanities and Arts (DRHA) Conference in Dartington, Devon, UK, on 3 September 2006 will be followed by a series of events and activities, details of which will be announced on our website and posted to VISA-3D list (www.jiscmail.ac.uk).

3DVisA also provides the Secretariat for *The London Charter*, a proposed international benchmark for the use of 3-dimensional visualisation in the research and communication of cultural heritage which is now open to consultation (www.londoncharter.org).

The Network is currently carrying out a survey of 3D projects and soliciting views on the needs of the 3D visualisation community. Your participation, comments and suggestions will be greatly appreciated. ■

Editorial

by Anna Bentkowska–Kafel

Welcome to the first issue of the 3DVisA Bulletin. The Bulletin is intended as a forum for a community-wide debate on key and topical issues in the use of 3D visualisation within Arts and Humanities subject areas. It will be published every six months and will profile projects and people, so that we know better who we are and what we do within the 3D community; where to look for inspiration, expertise and models of good practice. As this issue already proves, we promise not to shy away from difficult issues and polemics. Contributors to this issue place themselves on opposite sides of representational and non-representational visualisation. Your responses, suggestions and contributions to the forthcoming issues of the 3DVisA Bulletin are most welcome.

The overarching theme of this issue is *place*. “Place is as much a *psychological* phenomenon as it is a physical one”, write Yehuda E. Kalay and Paul Grabowicz. How does this affect digital visualisation, and how the latter changes our relationship to real places?

Dartington College in Devon, the venue of the 3DVisA Launch, is renowned for its contribution to the visual and performing arts. In this context, it seems appropriate also to look at the use of 3D visualisation techniques in these domains. Scholars and students from the University of California at Berkeley are recreating the jazz club scene of the 1950s in West Oakland, California. The challenges this project represents will be familiar to many.

BioMapping, a 3D method featured in this issue, is notable for its participatory character and wide appeal to various audiences. The artist, Christian Nold offers an alternative view to ubiquitous surveillance and biometric controls.

As we embark on new projects we must not neglect the work which has been done in the past, paying particular attention to created electronic resources, their use and preservation. Drawing on his work on the digital reconstruction of the Buddhist stupa at Borobudur, Java, Michael Greenhalgh casts a critical eye over the models of the Phimai Temple site in Thailand, and assesses the limitations of VR technology. The expectations of online resources often go beyond their original purpose. The Internet opens up digital reconstructions of heritage “to people who otherwise would never be exposed to these cultural sites” (Kalay and Grabowicz). Phimai demonstrates the importance of such resources for broadening the understanding of other cultures and religions. ■

Message from JISC

by Andy Wistreich

The Joint Information Systems Committee (JISC) is committed to the promotion of digital technology in UK Further and Higher Education. We support new environments for learning, teaching and research, and access to electronic resources. We have recognised the needs of those involved in 3D visualisation and are delighted to be able to support the 3DVisANetwork and hope that together with VizNET, it will develop into a full Advisory Service for the UK research community. ■

Featured 3D Method

*The Artist Christian Nold talks to Anna Bentkowska–Kafel about **BioMapping***

BioMapping is a participatory methodology for people to talk about their immediate environment, about their locality, about their communal space. It's not representational. Instead of recreating something, I'm trying to use 3D visualisation as a way of talking about the space. As part of this method I have a device, which can be used by lots of people. It consists of a lie detector connected to a GPS unit, which measures your location and your arousal at the same time. By combining the two I can talk about the arousal in certain locations. A Galvanic Skin Response sensor in the form of finger cuffs measures the sweat level. Geared with this device, which logs data, people go for a walk. When they return data are visualised and annotated.

There are two kinds of visualisations. In the older visualisation I used a colour scale from green to red; green being a low arousal, i.e. a calm area, and red being a high arousal. It was dot-based and 2D. I built it in Macromedia Director. Now, in Google Earth I visualise height as indicator of arousal and use different colours for different walks.

Annotations are done after the event. People comment about the space or about the experience, such as commenting on “crossing the road Italian style”, or trying to think what happens when they ‘peak’.

Nothing is more interesting than if you ask people to think about their walk and then show them the map. It allows people to remember things they would not otherwise think about. There are many things we forget about when we go for a walk, so many things simply get lost. Some people say this is a kind of paranoia or schizophrenia technology. It makes us constantly reflect on our experience, constantly makes us aware of ourselves.

There is something very performative about *BioMapping*. People can go where they like. Sometimes people go to re-explore where they go for a walk everyday; sometimes people take their walk to work; sometimes people go to places they really love. It's quite interesting when people have an agenda. It's a performance where I'm directing their life in a strange way, thinking how technology could be used on a larger scale. We constantly perform for CCTV cameras every day.

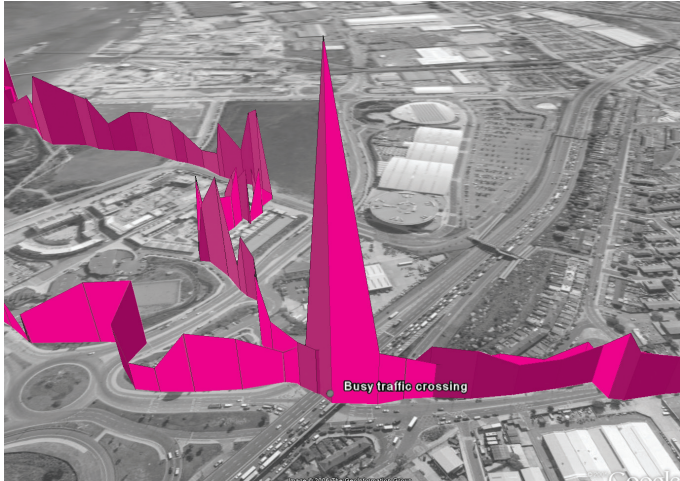


Image © The GeoInformation Group 2006

BioMapping is almost like a three-dimensional diary drawn across Google Earth. There are no people visible on Google Earth: you can spin the whole world but you won't see a single one of two billion people living there, which is quite bizarre. Suddenly, with *BioMapping*, you can see these very detailed tracks of somebody's experience.

Visually, it has a certain authority. Maps all have authority and the 3D quality gives this authority to the project. You see a peak and people almost need to talk about this peak; it becomes a discussion point.

Visual representation is important but it is not for aesthetic reasons that I've chosen maps. I've chosen maps because they talk lots of languages we are familiar with. We are familiar with scientific visualisations such as cardiograms. When doctors look at a cardiogram they look at pathology, they try to see what's wrong about it, looking for the one missing bit. So the idea of *BioMapping* is of almost a cardiogram put across the landscape. I'm interested how people deal with these mixed languages: the language of maps—which is about power—and the scientific language of cardiograms. I want people to find their own way of negotiating between the two.

I teach New Media Histories at the South Bank University, London and I do Electronics Clinics at the Bartlett, Faculty of the Built Environment, which is part of University College, London. We teach architectural students how to deal with interactive environments. They want to walk into a building and for their presence to transform the buildings. So they want a bunch of

sensors to manipulate motors to move the walls and change lighting levels. There is a lot of thinking going on at the moment about physical computing: the idea that our bodies interact with computers in a very transparent way. We won't be using computers any more. We'll be interacting with 'stuff'.

It's the opposite of Augmented Reality. It's also a big reaction against the 1980s idea of Virtual Reality. The idea was that the real world suddenly goes into a computer. Now computing is becoming invisible. Nobody talks about Virtual Reality any more. The idea that computing is every object we touch is where we're going right now. We are not talking just about mobile phones anymore, we are talking about Radio Frequency Identification (RFID) tags; about things being embedded everywhere; about pervasive or ubiquitous computing. We will be using doors that are going to recognise who we are and why we are opening the door. Some will open for us, and some won't. Biometrics is crucial, because this is the future of technology. Technology is becoming invisible.

BioMapping is different from architectural simulations that predict how new buildings will be used, and is also very different from recreating historic spaces. I think you can't recreate spaces. I personally find it bizarre to try to recreate a historic space. It seems to me the most illogical use of technology. When people apply technology to the past they are actually creating something else. It's a new product. Recreating atmosphere is a dubious concept. Atmosphere is about people. How can we recreate people to achieve this? By using avatars? Technology should not be used to simulate. Simulations are terrible. Simulations are 'a crime' in many ways. The idea of simulating human experience is really problematic. Unless we see it as being very weak simulation; unless we accept that this is a simulation in order to engender future different behaviour.

It is really interesting to simulate storms and the greenhouse effect, but the idea of simulating the everyday life to that kind of minutia level becomes a way of transforming our experience in a way that isn't very helpful for social relationships. It becomes very hermetic.

It reminds me of *Star Trek*, for example. When they go to the simulation suite and they suddenly appear in a wild-west town or a jazz salon. These are very weird, sanitised visions of a particular era that miss out people's actual experience. Every time I go to a club my experience is different. It's never universal. Simulations become sealed, static, hermetic, and restricted to a particular experience. In one space there are always multiple stories happening. ■

Featured 3D Project

OAKLAND BLUES. *Virtual Preservation of Seventh Street's 1950s Jazz Scene*

by Yehuda E. Kalay and Paul Grabowicz

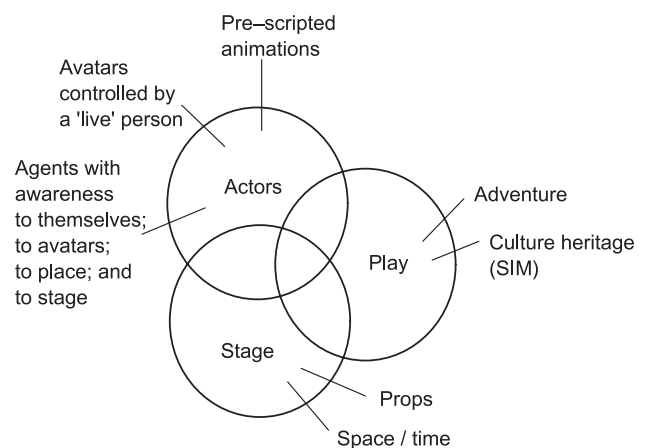
Places have *history*: past, present and future. They grow, flourish, and decline, along with the site and the culture in which they are embedded. Digital media can be used to re–create cultural content through modelling buildings, people, and their activities; sophisticated video–game engines can be used to let people virtually 'inhabit' the digitally recreated world; and the experience can be made accessible via the Internet, opening it up to people who otherwise would never be exposed to these cultural sites. Yet, like every medium ever used to preserve records of cultural heritage, digital media are not neutral: they impact the represented content and the ways the audience interprets it. Perhaps more than any older technology, digital media have the potential to affect the very *meaning* of the represented content in terms of the cultural image they create. This article examines the applications and implications of digital media for the recreation and communication of cultural heritage, drawing specifically on the lessons learned from a Virtual Reality project to recreate the thriving jazz and blues club scene in West Oakland, California, in the 1940s and 1950s. The project was a joint effort by graduate students in the University of California Berkeley Architecture Department and students in a class at the University of California Berkeley Graduate School of Journalism.

In the 1940s and 1950s, Seventh Street in West Oakland earned a reputation as a West Coast rival of the Harlem music scene. Most of the legendary blues and jazz singers and musicians, as well as soul and rhythm and blues artists, performed at the clubs, including Jimmie Witherspoon, Sugar Pie DeSanto, B. B. King and Aretha Franklin. By the mid 1960s this remarkable part of Oakland's heritage was all but destroyed, the victim of a number of different urban redevelopment schemes over the years. The story of Seventh Street has been told in bits and pieces over the years in a variety of different media: press reports, photographs, audio and film recordings.

The convergence of the desire to re–tell the history of Seventh Street and the advent of new media has provided us with the opportunity to develop an immersive, interactive, non-linear narrative that will help visitors experience Seventh Street's cultural heritage as it was in the 1940s and 1950s. But the question of which exact type of new media technology to use, and what is the

appropriate manner of using it, became immediately apparent. Digital gaming—the new media technology we thought would be useful for this purpose—provided no useful clues in and of itself: it is a new technology, one with a relatively short history, and devoid of much in the way of comprehensive theory or many useful precedents to guide its development. Although in principle it is a cross between filmmaking and architectural design, it is a technology of illusion, creating an intangible reality like never before. Unlike architecture, whose principles it freely borrows, it can only be inhabited by proxy. Unlike film, it provides visitors or players (the term 'viewer' is inadequate) with much more freedom to explore the 'world' at their own volition.

We chose to compare our virtual place–making to making stage–plays. These comprise a stage (a context), a narrative (the play), and actors (which include the audience, in different ways). The notion of place as a stage–play drives literary works, films, video games, and architecture. It provides a framework for understanding the individual contributions of the components, and their mutual interactions. The following diagram illustrates the components and their relationships:



The interactions between these components are what make them a 'place': the avatars, which are human–like representations of the visitors, can 'see' other avatars (as well as the other components of the game), and be 'seen' by them. Likewise, the non–player characters, or agents, which are automated representations of the people who lived on Seventh Street, can be seen by the visitors, and can react to their presence. This reaction both conveys some of the essence of the cultural heritage (they can tell stories related to the history of the place), and add to authenticity and 'sense of place' of the experience. And of course the context (buildings, cars, etc.) helps locate the experience, both spatially and temporally.

Re-creating the context—the 'stage'—proved more problematic than we anticipated in our project. Obtaining a comprehensive contemporaneous photographic record of what the site looked like even only 50 or so years ago proved very difficult and time-consuming. As a



Image © West Oakland Jazz Clubs Project 2006

result, at least in the initial phase of our project the re-creation of many of the buildings on Seventh Street had to be generic representations of the buildings drawn from photos of nearby structures. The development of the eight city blocks comprising the target of our study became a matter of modelling buildings, street furniture, and other 'props' in 3D StudioMax, a conventional modelling software developed by Autodesk. This approach was both convenient, building on our familiarity, as architects, in modelling with 3DS Max, and because the software that we chose to power our virtual place, the game engine Torque, accepts 3DS Max models.

Using the Torque engine, made by *Garage Games*, to power our virtual world provided many advantages: it incorporates a physics engine, whereby 'gravity' is imposed, solidity of objects can be enforced, and time of day and weather phenomena can be included. Torque also provides mechanisms to support avatars and NPCs (player characters and non-player characters), which were useful for implementing the actors.

Constructing the 'play' aspect of the reconstruction proved to be hardest of all: which one of the many video game genres is more appropriate for this purpose than others? Should we use the adventure game approach, but write an overall narrative first about what Seventh Street was like and what happened to it, with characters, quests and levels of the game play stitched together within that framework? Is that narrative compelling enough to motivate people to want to play this game? Or does the story instead need to be written more as a mystery to be solved (an aspect of most adventure games), with the player unlocking the secrets of Seventh Street and what led to its demise? Should we give the player the ability to change the course of history and make the game about saving Seventh Street (thus drawing on simulation games and the player's ability to re-create aspects of the virtual world)? Or should we make the game more of a social experience and allow players to band together, perhaps in competition with one another,

to save or destroy Seventh Street (as in massively multi-player games)?

In the first phase of our project we constructed the stage for Seventh Street, we developed the characters in it, and we pieced together some of the scenes within that world. But the 'play' still remains to be written. The choices made will not only determine how we tell the story of Seventh Street, but the particular ways in which people will experience and understand Seventh Street and this aspect of Oakland's cultural heritage. ■

More at www.viznet.ac.uk/3dvisa/bulletin1.html

3D Resources

Computer Reconstruction TEMPLE SITE AT PHIMAI, THAILAND

A review by Michael Greenhalgh

The days when computing was text-only are long past, and a combination of computer and network speed, colour, WWW and graphics software has considerably expanded our views onto the world. For some, the computer monitor is indeed the window into a different world; one which may have few connections with that in which we all live. Of course, those worlds are different for all kinds of reasons, and the salient point about worlds inside the computer is that they must somehow be created with software, and are not necessarily intended to be a simulacrum of our real world. Indeed, assuming we want and need that computer world to be 'real', then the software must create the illusion of reality, some of the features of which include perception of depth, texture and even atmosphere.

What might a visitor expect to learn from a site such as www.phimai.ca? In basic information, perhaps details of the UNESCO submission for listing, something about the Phimai Historical Park, and links to the many other Khmer monuments available across the web. Remote sensing has proved very useful in the area, with an interesting report to UNESCO by Surat Lertlim, and perhaps information on heritage management in Asia, and comparative data from the Greater Angkor Project.

Completed in 2001, the website is the work of Richard M. Levy, Associate Professor of Planning and Urban Design, and Director of Computing in the Faculty of Environmental Design at the University of Calgary. It is divided into a suite of HTML pages designed by Peng Peng: an *Introduction* gives a summary, and a project description; *The Site* gives access to photographs of various kinds, to a QuickTime movie, and to a plan of

the Phimai site. *The Computer Model* offers animation sequences, a movie, a QuickTime Movie, and access to a series of enlargeable thumbnails on *Constructing the Model*. There are also contact details, awards and exhibitions details.

The quality of the site design is fine, but the range of the content could be expanded. So also could the size of the images: all of three historic photos and the twelve air photos are only 450 pixels wide. Some of the 'air photos' are in fact reconstructions, which is (probably unintentionally) deceptive. Any site dealing with both photographs and models should keep very clear boundaries between the two. *The Photo Gallery* offers 16 images, again all too small, but at least keyed via a red dot to their location on the adjacent site plan; but the plan is dead; you cannot click on a section of it and bring up the relevant image. Initially the heart leaps as the site plan on the first page is indeed clickable, but all this does is bring up a larger version. ALL plans are in Thai script, which might be a bit of a steep learning curve for some of us. As we have now come to expect, the *Computer Model* again offers small images only. There is no zooming, so it is impossible to get in close enough to see the detail if any. All the images are 'dead'—the user has no control over detail—and can only move from one image to the next.

The Introduction offers a somewhat politically correct explanation for the model: "Reconstruction of the temple site in Phimai serves as a case study highlighting the potential of computer visualization as a tool in heritage resource management. Besides offering archaeologists, historians and museum curators a non-evasive [invasive? MG] environment for testing reconstruction scenarios, virtual worlds offer the public access to important historic monuments without the wear of excessive visitation".

This provokes several questions: Just what is the potential of computer visualisation? Why hymn computer models as a way of avoiding "the wear of excessive visitation" when the next paragraph but one states that "The author built the model to include in an educational video and website in order to promote the site for tourism"? The two statements are contradictory. The notion of "testing reconstruction scenarios" is misleading for monuments such as Phimai, where the setup is so structured and well known from many *comparanda* that the reconstruction is never in doubt. Such 'reconstruction scenarios' are indeed a use for such models, because they necessarily operate where the archaeologists have little idea of detail.

The models provided are as good as the technology allows. *Constructing the Model* is the most interesting page, in that it demonstrates clearly the problems inherent in the technology—namely the simplification

of forms and of textures, the repetition of both, and the overall unworldly look-and-feel (best seen in the comparison between the computer interior view and the photograph). The difficulties should not surprise us, since the process involves stripping down the real world to its computer-understandable components, and then rebuilding it in the machine, which is far from simple, and tedious, time-consuming and expensive to do to any level of accuracy. But to repeat, any shortcomings are not Professor Levy's fault, but endemic to such modelling. This might explain why the computer models on these (and plenty of other) pages are shown at such low resolution: seen in close-up the reconstructions would reveal themselves even more clearly to be lacking in both detail and accuracy.

Will computer modelling get better? The problems inherent in the technology seem incapable of solution. VRML and its descendants have been around for several years now, but have never lived up to the hype which is endemic to computing. The killer question is to ask what a computer model of any such site as Phimai can yield to the student/researcher than a good collection of photographs cannot? The answer must surely be 'very little', since the models are extrapolated from photographs, in the first place, gaily cutting corners (I know, I've done it) along the way. Even when money can be thrown at laser measuring and a huge turntable (as with the *Digital Michelangelo Project*), the result is no doubt one of micro-accuracy contour-wise, but with a surface as dead as old putty—the textures are still any enormous problem. And in any case, Phimai has insides as well as outsides, and lasering it for computer modelling would be for rich people with time on their hands.

I live in hope that all the doubts about the technology expressed above are now ill-founded. All any protester has to do is to email me with details of any reasonably complicated inside-and-outside model (no more Renaissance statues, thank you, far too simple), and I shall eat this *Bulletin* and re-embark on building accurate and detailed computer models which may fearlessly be shown in a web browser at high resolution. Until I get that email, I shall stick to photographs, panoramas, zooming devices and the rest—and in large enough quantities to give some satisfaction to researchers. ■

More at www.viznet.ac.uk/3dvisa/bulletin1.html

NEWS AND EVENTS

3DVisA invites you to:

ATTEND the 3DVisA Network Launch, DRHA Conference, Dartington College, Devon, UK, on 3 September 2006, and a panel session which will introduce the Network's plans for the future.

CONSULT Comments are invited on the proposed *London Charter for the Use of 3-dimensional Visualisation in the Research and Communication of Cultural Heritage* (www.londoncharter.org).

PARTICIPATE 3DVisA is compiling a report on the needs of the 3D community. We would like to hear from all involved in the creation and use of 3D visualisation in Arts and Humanities subject areas.

PROPOSE We would like to hear from postgraduate students at various UK colleges, their lecturers and prospective sponsors, regarding setting up a 3DVisA student award for the best 3D visualisation projects. Please send your suggestions for selection criteria and submission formats.

SUBMIT a profile of your 3D projects to the 3DVisA Survey. Please contact us for further details.

VISIT the Royal Botanic Gardens, Kew and explore Kew's past through 3D reconstruction, *How Kew Grew*. Produced by the King's Visualisation Lab in the Centre for Computing in the Humanities, King's College, London. The animation is displayed in the Princess of Wales Conservatory until 24 September 2006.

URLs in this Issue

BioMapping – www.biomapping.net

Borobudur – <http://rubens.anu.edu.au/htdocs/bycountry/indo-nesia/borobudur/>

How Kew Grew – www.kew.org/events/howkewgrew/animationinfo.htm

Joint Information Systems Committee – www.jisc.ac.uk

London Charter – www.londoncharter.org

Michelangelo Project – <http://graphics.stanford.edu/projects/mich/>

Phimai Temple Site – www.phimai.ca

UNESCO World Heritage (with links to World Heritage sites on Google Earth) – <http://whc.unesco.org>

VISA-3D List – www.jiscmail.ac.uk

VizNET UK Visualisation Support Network – www.viznet.ac.uk

West Oakland Jazz Clubs Project – <http://journalism.berkeley.edu/projects/jazzclubs/>



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Who's Who in this Issue

Hugh Denard is Director of the JISC 3DVisA Network and Associate Director of King's Visualisation Lab, King's College, London where he convenes an MA in Digital Culture and Technology. His research focuses on the history of Greek and Roman theatre, and the application of advanced visualisation technologies to research in the Arts and Humanities. He is editor of *Didaskalia: Ancient Theatre Today* (www.didaskalia.net) and co-directs a number of funded projects, as well as being centrally involved in the London Charter initiative (www.londoncharter.org). A book on Roman theatricalism in the domestic sphere, jointly authored with Richard Beacham, will be published by Yale University Press in 2007.

Paul Grabowicz is Adjunct Professor of Journalism at the University of California at Berkeley. He directs the New Media Programme at the School of Journalism and teaches classes in multimedia reporting, new media publishing and computer-assisted reporting. A professional journalist for more than 25 years, he spent most of his career as the investigative reporter at *The Oakland Tribune*.

Michael Greenhalgh taught at the University of Leicester, and has held fellowships at Christ Church, Oxford and Corpus Christi, Cambridge. He is now Professor Emeritus of Art History at the Australian National University, Canberra. He embraced digital technologies in his research and teaching as soon as they became available, and the progression from still digital images to panoramas and other 3D visualisation techniques seemed only natural. He is a contributor to the *Companion to Digital Humanities* published by Blackwell's in 2004.

Yehuda Kalay is Professor of Architecture and Director of the Center for New Media at the University of California, Berkeley. He is a founding member and past president of ACADIA (Association for Computer Aided Design in Architecture), and Editor-in-Chief of the journal, *Automation in Construction*, published by Elsevier in Oxford, UK. Kalay's research focuses on new media, collaboration, knowledge-based design, and extending the principles of architectural design to Cyberspace. His most recent book is *Architecture's New Media* published by MIT in 2004.

Christian Nold is a London-based artist and cultural activist. He studied Fine Art at Kingston University and Interaction Design at the Royal College of Art. He developed *BioMapping* as a system for recording people's bio-data along with their geographic location. A recent commission by Independent Photography enabled the artist to work on visualisation of 'actions' with multiple participants and create the 'Greenwich Emotion Map'. His book *Mobile Vulgus* was published by Book Works in 2001.

Andy Wistreich is JISC Advisory Services Liaison Manager. He works with JISC Regional Support Centres, JISC infoNet, JISC Legal, TASI, JISC-PAS, Netskills and TechDis, facilitating the sharing of good practice and helping these services to develop their strategies in order to ensure maximum benefit for the UK's HE and FE communities.

Disclaimer: The Bulletin expresses views of the authors and not necessarily those of the JISC 3D Visualisation in the Arts Network. Material in this issue is protected by copyright; to use it elsewhere please seek the consent of the Editor.

JISC



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