

persuasive architectural image. For example, an unconstructed building will be modelled using vector techniques, and the resulting surfaces textured with photographs of real building materials (a form of image warping). This will be rendered to give the effect of sunlight and shadow, and the result be collaged with heavily doctored photographs (probably taken separately) of the surrounding context and a sky. Entourage like people and trees will be more collaged photography, while vehicles and street furniture are more likely to be synthesised from vector models. Objects seen through glass, and others seen in reflection, will probably be rendered separately, and the images mixed to give a final balance. It is likely that every single pixel will in some way be derived from one or more captured images, and it would not be unusual for fifty or more individual photos to be contributing something to the mix.

There is something very curious going on here. The aim is to make an image that looks like a photograph – the technique is called photorealism. Yet this is being done just as cgi has destroyed the ‘probative value’ of photorealistic imagery. Furthermore, prior to cgi, there was no tradition of architectural imagery imitating photography. In fact rather the other way around; architectural photography imitated architectural graphics, using special equipment to achieve a two-point perspective with the horizon one third of the way up, long exposures with tiny apertures to eliminate passers-by and give uniformly high detail and depth of field, orange filters to exaggerate the sky, and so on. Architectural graphics for their part were set-up on a drawing board, with T-square and triangle (hence the two-point perspective), and rendered using illustrator media (pencil, pen and ink, pen and wash) and using all the illustrator’s skills of modulating emphasis and level of detail to direct attention to the subject.

It is clear from Adams and Figueiredo that architecture makes a good subject for photographs, but as Treib (*arq* 15.1, pp. 16–23) points out, the photograph (or any kind of perspective on a plane) does a rather partial job of conveying architecture. It can cope with surface detail and texture, sometimes does brilliantly with light and shade, but struggles with mass, and fails to convey interior space at all. I am sure most people who have studied architectural

history will have experienced the intense surprise of visiting a renowned building known previously only from grey lecture slides filched from Pevsner’s *Outline of European Architecture* – Perigueux, Notre Dame, San Vitale – and realising suddenly what all the fuss was about. And somehow the scale was always bigger or smaller than expected. The basic point of architecture is immersion, it cannot be appreciated without it, and the photographic medium does not provide it.

The great perspectivists (and Piranesi *par excellence*) as Adams suggests, mitigated this problem by using fine detail and internal incidents to draw the eye into the picture – encouraging prolonged exploration, even the use of a magnifier. This ability to ‘zoom-in’ is found in one interesting digital form – the QTVR Panorama. I share Adams’ enthusiasm for this low-tech form which is straightforward to capture with a camera or synthesise by cgi, requires only a web-browser to display, and provides a limited but still appreciable sense of immersion. Based on advanced use of image warping, the first panoramas were made by ‘stitching’ a sequence of photos taken as the camera pans around a fixed viewpoint. Nowadays it is possible to capture the whole set simultaneously, either by using the image reflected in a mirror ball, or by using five or six synchronised cameras oriented to the faces of a cube. New opportunities open if the cameras capture video. Moving the camera as it works captures a sequence of panoramas extended along a line; this is how Google Street View works. Alternatively the camera can be left more or less in place to record live action in the round, producing an immersive panoramic video. With synchronised surround-sound this could provide a new level of immersion, specially suited to the recording of architectural subjects.

The degree of immersion felt depends on how the imagery is presented; restricted on a small screen, considerably improved if projected at full scale, and improved again if the image is wide-angle, or surrounds the viewer as in an IMAX cinema or virtual-reality cave. However, even the small-screen version compensates for the lack of peripheral vision to some degree, by allowing the viewer to shift the angle of view.

In the case of unbuilt architecture, it is possible to synthesise panoramic imagery, and

even panoramic video, though it is not very likely to happen because the same effort (and it is substantial) could yield a fully interactive non-linear immersive experience – in other words a 3D computer game if it is on a small screen, a virtual reality experience if it is projected so as to fill the peripheral vision. The difference is that the viewpoint can be moved freely in the interactive space, while in the panorama only those viewpoints that have been recorded are available. This makes the space explorable, and enhances the feeling of immersion by giving additional visual cues, particularly motion parallax. I have no doubt that this kind of imagery best conveys architecture, in the sense of reducing the level of surprise felt on entering the real building.

These are the technologies applied in a rough but non-linear way to computer games, and with the highest degree of finish to linear Hollywood cgi spectaculars. It is noticeable how much longer the credits are for a film made this way; the modern fake photography is much more labour intensive than the old photographic fakery. In the architectural world non-linear representations are just beginning to be seen, more often for archaeological reconstruction than in the course of practice. Apart from expense, the persuasive image or video is required to maintain tight control over what is seen, and in what order, and allowing the viewers freedom to range over a project in their own way is feared to be counterproductive.

Notes

1. I have a vested interest to defend here, as this animation was one of two produced by myself and John Tredinnick in our research group at the University of Bath.

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Challenging a visual soundbite culture

In his excellent introduction to the recent ‘Print and Pixel’ issue of *arq*, Marc Treib examines the role, production and perception of images within the field of architecture, with a particular focus on ‘the shift from the printed image to one rendered in pixels’ (*arq* 15.1, pp. 16–23). The essay is

structured into six sections of varying lengths – an introduction; the advent of photography; dismissal of the aura; illustrating Modernist myths; representation and realities; print and pixel – in which the author provides succinct observations (with different degrees of depth) of what he perceives to be key issues and moments in the relevance of the relationship between image format and image perception.

Treib asks a number of questions: ‘What is the power of the image and its relation to our so-called reality? What are the key differences between images in printed and pixellated forms? How do these affect our study and teaching of architecture and architectural history?’ While these questions were partially addressed in the four papers following Treib’s introduction – for instance an equally lucid observation on the ‘perils and possibilities’ of ‘opening technology’s door’ by Nicholas Adams (arq 15.1, pp. 25–34) and by a study on the role of disseminated images in the reconstruction and refurbishment of Oud’s De Kiefhoek project in Rotterdam (1925–30 and 1990 respectively) and the conceptual use of the ‘image of the house’ in the Hageneiland project by MVRDV in Ypenburg / the Hague (2001) (arq 15.1, pp. 35–46) – they can also be looked at particularly with reference to some everyday situations or scenarios within architectural education and practice. Two issues seem key: first, the ever increasing flood of (unedited) images to be perceived (and attempted to be digested) on a daily basis, and, second, the resulting dichotomy between (image) content and presentation.

Having set a history and theory coursework essay following a twentieth-century lecture series to second year students, I received an email from a student asking me what kind of images should be used to illustrate the essay. In the essay brief I had asked the students to choose from a list of given architects and to discuss their relevance and standing in twentieth-century architectural history by analysing a building of their own choice, making reference to the building’s design by using plans, sections and elevations as illustrations. My student queried in their email whether the essay could be illustrated without the use of drawings as they found it difficult to obtain material on the building they wanted to write about. I replied back that I was surprised to hear that and that I was wondering

how an analysis along the lines asked for could be performed with no reference to plans, sections and elevations. The reply came that a lot of reading had been done and that photographs and a video of the building’s interior had been gathered and that this was thought to be sufficient to help understand the building. The student also made a case that, in their view, only the actual experience of the buildings could provide a real understanding of its qualities and that photographs in general were more useful than drawings to study a building. Having been initially amused and perplexed by this email correspondence I felt somewhat caught out by my own prejudices. In his paper, Marc Treib discusses the rather problematic issue of the moving image in the representation of space, making the salient point that ‘Simulations, films and videos may suggest the movement of eye and body [...] but none of them replicates to any acceptable degree the saccadic sweep of the eye as it compensates for its very narrow cone of foveal vision’.

In the author’s view, artworks like David Hockney’s photo-mosaics and the early films, or rather slide sequences, by Charles and Ray Eames, are perhaps more suitable to represent space because the media in which they are executed inherently express their own limits for representing movement, as opposed to the pretend spatial realities suggested in computer simulations. This view to me would suggest instinctively, perhaps in a ‘conservative’ way, that orthogonal drawings seem to be a natural first port of call when studying a building one cannot go to visit, partly also because one is aware of the medium’s limitations. An orthogonal drawing is a very particular description of a building – no more and no less – but it can never be mistaken for a simulation of the real thing. However, my student delivered a decent enough essay (with no drawings as illustrations) and proved via the second assessment component, a slide recognition test with a hundred questions on twenty-five buildings, that they had followed and understood the contents of the lecture course. In the context of questioning our perception and (re) use of images in the production of architecture, but also architectural research, the tutor’s initial view had been met with a perhaps more fragmented approach to studying architecture by the current generation of students.

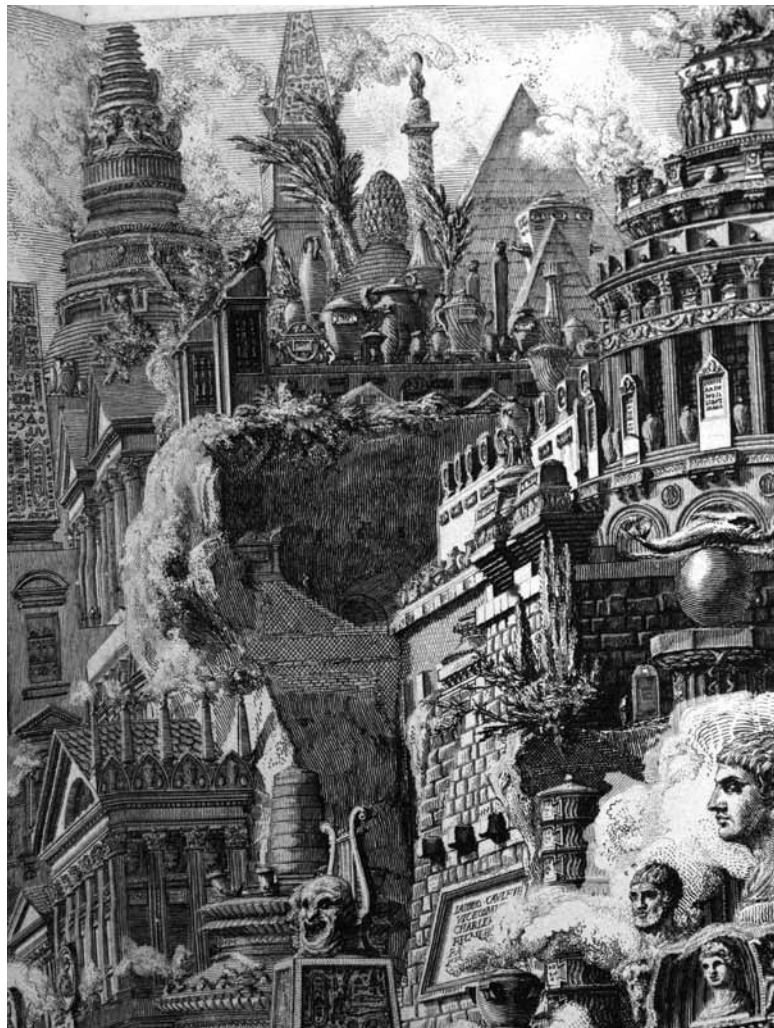
On reading Treib’s paper, I was reminded in part of Marshall McLuhan’s *Understanding Media*, where, in the chapter titled ‘The Medium Is the Message’, McLuhan took issue with the view stated by the American General David Sarnoff that: ‘We are too prone to make technological instruments the scapegoats for the sins of those who wield them [...] The products of modern science are not in themselves good or bad; it is the way they are used that determines their value.’ McLuhan described Sarnoff’s belief as ‘the voice of current somnambulism’, saying that: ‘There is simply nothing in the Sarnoff statement that will bear scrutiny, for it ignores the nature of the medium, of any and all media [...] It has never occurred to General Sarnoff that any technology could do anything but *add* itself on to what we already are.’ Marc Treib’s reference to Edward Tufte’s criticism of PowerPoint presentations and the ‘detrimental effects’ that they can have on our critical faculties, particularly because ‘their reliance on “Bullet points” as a primary structure of thought’ acknowledges that images and their influence on us are ‘rarely neutral or benign’. Anyone who has witnessed a hastily thrown together lecture, a presentation as part of a competitive (academic) job interview, a disengaged history presentation by a student or a sales pitch by an architect bidding for a project may hence be reminded that in McLuhan’s terms PowerPoint has, more often than not, become the message. Unrelated to architecture but pertinent to the dichotomy between PowerPoint visuals and actual content, in recent conversations with scientists working in mechanical engineering and the chemical industry, respectively, complaints about the tendency to rely on what was described as ‘PowerPoint Engineering’ and to concentrate on presentation at the expense of content, were made in abundance. A young architect colleague recently described a scenario in which a newly commissioned large-scale building was ‘designed in a week’ – while an equal amount of skill and effort was put into the design of the PowerPoint presentation to communicate the scheme to the client.

Another point raised by Treib was that of the problem of being able to control scale when working on a computer screen. As he rightly suggested, it is incredibly difficult for an architecture student to keep

an overview of a design when they have to constantly zoom in and out of a drawing; and yet, for the student who is not used to other ways of working it must seem natural. One can only speculate on the impact of this on design practice but it is hard to project only positives. For the (old-fashioned) design tutor it means that they are increasingly confronted with students coming to tutorials armed with nothing else but their laptop, zooming in and out at increasing speed, as if their sole purpose was to confuse the tutor and to camouflage or disguise their projects, and thus the content of their intellectual work. To some degree this is not dissimilar to the PowerPoint Engineering syndrome described above, as often a disproportionate amount of time in such a tutorial is spent asking the student to stop zooming or rotating their scheme on the screen, rather than spending the time available discussing the credentials of the project itself.

In the context of architectural competitions, the power of the pixellated image on the web is an issue, which yet has to be explored in its full repercussions. Already prior to the dissemination of competition results through images on the internet, there had been an abbreviation in place of the actual work submitted and awarded prizes in competitions, particularly through the selection of iconic 3D images published in journals and magazines, rarely helping the reader to understand how a scheme would work in plan or section. This development has been further exaggerated by the possibility of distributing material on the web – be it on architects' own web sites, the sites of trade journals or via specialist competition web sites. This trend has undoubtedly led to a culture of visual sound bites in architecture in which images are often perceived and digested out of context, and thus are being re-used in what must be suspected an uncritical (and uninformed) manner. In *The Evil Demon of Images*, Jean Baudrillard had already observed what he perceived to be the problematic reversal in the relationship between object and image:

[...] it is the reference principle of images which must be doubted, this strategy by means of which they always appear to refer to a real world, to real objects, and to reproduce something which is logically and chronologically anterior



3 Giovanni Battista Piranesi, *Le Antichità Romane* (1784), detail from the Via Appia, vol.2, pl.2



4 MVRDV, Hageneiland, The Hague, 2002

to themselves [...] As simulacra, images precede the real to the extent that they invert the causal and logical order of the real and its reproduction.

Baudrillard's statement acknowledged the advent of this visual sound bite culture which now is an integral part in the way we perceive the world. However, and as outlined by Treib and his fellow contributors, the pixellated image, following all the other developments in the depiction of physical objects (or their images) is here to stay, and the skill will be how to tame it rather than to reject it. The pixellated image – whether produced as part of a design project or perceived and viewed as part of criticism or study – is now one of a range of media available to the architect (and student). As with all previous changes in representational techniques, when designing surely the merit must lie in the use of a combination of media, intelligently applied in accordance to the respective task at hand. A knowledge and understanding of the production techniques of a specific medium can always lead to a better understanding of the limitations and efficacies of the respective medium itself. In some sense the damage has been done, and what's left is to try and use it to our benefit.

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Safety and risk

The summer before my first semester in graduate school at Yale, I enrolled in a course that introduced the safe use of tools in the workshop. The term 'safe' was not used as a form of conservatism or lack of risk taking but rather in service to the proper use of the tools, in the hope that one would not cut off a fingertip or worse. At the end of two weeks, my thirty-five classmates and I had taken a couple of pieces of stock 1x12" pine boards and transformed them into a two-tier bookshelf. Mine was painted orange and held my growing collection of architectural books. I still have my bookshelf but today it's painted black and holds a different yet equally important collection of books: *Hop on Pop* and *Go Dog Go*.

So here was a skill, facilitated by a particular analogue technology

that the school wanted to us to learn. But why? So we could use this technology to our advantage while in school? To what end? Were the tools intended to facilitate design thinking? Were they meant to work out details that couldn't be figured out by drawing? Were they meant to replace the pencil? No, the tools of the woodshop – like the latest digital tools of the day – are meant to work in conjunction with, not to replace more traditional methods of design thinking. Which brings me to my contention. That is: the pencil doesn't think for us, so why should we let the computer.

In the woodshop, where we were using traditional technologies, were we just playing with materials or were we practising design thinking? Or both? How does this translate to the digital world? Playing in the world of the woodshop is very different to playing in the virtual space of the digital realm. In the digital world there are no limitations or restrictions to what one does. So, if there are no restrictions then where is the risk?

In the Höweler + Yoon Architecture exhibition, *ONE dpi*, at Northeastern University, Meejin Yoon and Eric Höweler describe the exhibition as follows:

The exhibition reflects on the role of the image in the production and dissemination of design ideas [...] Our representational strategy for ONE dpi arises out of an interest in the economics of images. In a post-spectacular society, the image is more than a surrogate for lived experience, but a source for new realities, practically indistinguishable from reality itself. The glossy full-bleed image so common in publications and exhibitions asserts itself as a seamless verisimilitude of reality. Among a certain class of image-makers, resolution has become a new form of currency: the more vivid the image, the more expensive its production, the more 'real' its content appears.

The HYA exhibition consisted of complete images pixellated on the wall by stripping away the residual space between a series of dots 1" in diameter spaced equally 1" apart. In this instance, the brain fills in the missing information. The new reality is easily digestible. But is the reality the whole image or the pixels of the image? Does each pixel tell a different story? Is the phrase, 'the sum of the parts is greater than the whole' true? Or is the whole greater than the parts/pixels?

In the Northeastern University Veterans Memorial, a built project by my firm bauenstudio, we employed image pixellation to

represent historic events while simultaneously using the viewer's distance from the pixellated image to provide meaning. The memorial features an official commemoration; a laser-etched mural depicting iconic images from five wars. These scenes have been modified and abstracted into pixellated images. Viewed from afar, the pixellated images are clear. But, as one approaches, the images dissolve into an ethereal effect. Thus, these visual images on the wall operate at a multitude of scales, engaging the viewer differently both up-close and from a distance. The exhibition and the memorial share similar physicalities, both employing the pixel as the syntax for design. Can they be the same; can image equal architecture? In the built realm of architecture, is it OK if this phenomenon is not understood? The notion of image, as suggested by HYA, reduces architecture to a two-dimensional artefact. Image suggests a single viewpoint. Architecture, on the other hand, operates on infinite viewpoints. Using the three-dimensional digital model to generate the image thus has its shortcomings. The image in this case is still a projection. At best it can be considered having infinite views but in actuality each can only be singularly viewed in the two-dimensional realm. What, then, is the intention of the architecture? Of the image? How does one translate the image to architecture? In the Veterans Memorial project, we thought through the experience of the pixellation but studied the phenomenon in perspective and orthographic projection, plan and section. The question arises about the difference between the process of architectural design (design development) and the image representing the architectural design.

When the notion of the 'image as reality' manifests in design schools, the process of design changes. Are students designing for the image or the architecture? Do students 'think' when they create a digital model and then cut a slice through it to create a plan or section? This method of design process reduces the plan and section to the 'resolution' of the model rather than an integral tool to develop the model. Do students understand how to use the section as a way to change, manipulate and think about spatial experience? Do they use the digital model as an investigative tool to discover what it is they designed? More often, students are 'cleaning-up' the sliced