



All in the past

Or is it? Virtual heritage promises realistic experiences of Gettysburg, the Colosseum, Stonehenge, and Hitler's vision of a post-war Berlin. Benjamin Woolley steps back in time.

As I write, an event is already underway in the centre of London, carrying the intriguing title "Virtual Heritage 96". Virtual heritage? What could that possibly be?

To the snobbish, all "heritage" is virtual — a fake recreation of the past that panders to the public's poor knowledge of history. It's all about grand country houses opening up shops to sell tacky knick-knacks, sales executives dressing up as Roundheads, and theme-park rides through reconstructed peasant villages saturated with synthetic sewage smells. What could be less real, more virtual?

Stonehenge, for one. To demonstrate the power of its new generation of processors, Intel got together with English Heritage and, under the direction of Professor Robert Stone, the VR pioneer who now runs VR Solutions, created a VR version of Stonehenge that could be accessed over the internet using Superscape's Viscap browser, a proprietary client for viewing scenes generated using the company's VRT authoring software.

Thanks to the involvement of English Heritage (the quango that manages Stonehenge), the consortium was given access to the site and built up a precise database of its geometry. This database was then used to generate models that showed what the 'Henge would have looked like through the ages, from 10,500 years ago to the start of the next millennium. The result was a good demonstration of how VR (in the sense of real-time 3D graphics) can be used to recreate a lost past.

Although words like "photorealistic" were bandied about to describe the quality of the

model, nobody could possibly be fooled into thinking that the images of the Virtual Stonehenge you saw in the Viscap window were photographs. Nevertheless, it did give you the vaguest notion of what it might be like to be there without the distractions of coachloads of tourists and carloads of screaming children. It let you get inside the ring of stones, something we have not been allowed to do in actuality for years.

That, then, is an example of "virtual heritage". To quote Dr William Mitchell of Manchester Metropolitan University, a speaker at Virtual Heritage 96, it "...gives users the freedom to explore monuments that may no longer exist or may have been damaged or spoilt by the effects of tourism. Exploring virtual reconstructions leaves no footprints and can potentially allow a user to examine details that are just not possible to see physically."

Dr Mitchell has himself contributed to our virtual heritage with a project entitled "The Tomb of Menna", which formed the basis of his contribution to the Virtual Heritage 96 conference. Menna was an Egyptian scribe

of the 18th Dynasty (whenever that was) and his tomb was discovered earlier this century in Thebes, the ancient city across the Nile from modern-day Luxor. Its recreation has been achieved using VRML, and pretty impressive it is too (Fig 1). The geometry is simple. The detail lies in the textures, which are highly compressed JPEG images of the friezes on the tomb's walls.

This is just one of an expanding array of projects that make up the virtual heritage movement. There's virtual Gettysburg, a virtual Chinese Terracotta Army and the virtual Colosseum. I myself was involved in realising a virtual Germania. Hitler planned to rename Berlin as Germania after he had defeated the allies. He even got his architect, Albert Speer, to draw up detailed plans, which featured on a TV programme about Berlin's history and future as a united Germany's capital. With the help of our friends at the modelling company, Modelbox, we used the plans to render up a series of animations. It was, I remember, an exciting process, since it allowed us to experience the impressive and oppressive scale of Speer's grandiose vision in a way Hitler himself never could (Fig 2).

It is possible that virtual heritage is a passing fad. The point of preserving Stonehenge is to provide a means of keeping in contact with something authentic in an increasingly artificial world. So to that extent it seems to be a contradiction in terms. It might also provide an excuse for

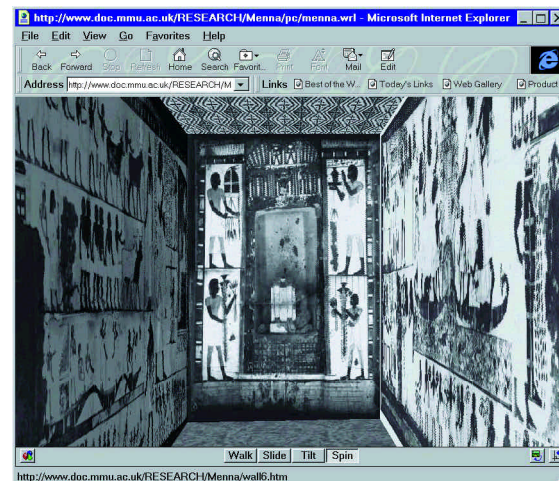


Fig 1 The Tomb of Menna by Dr William Mitchell

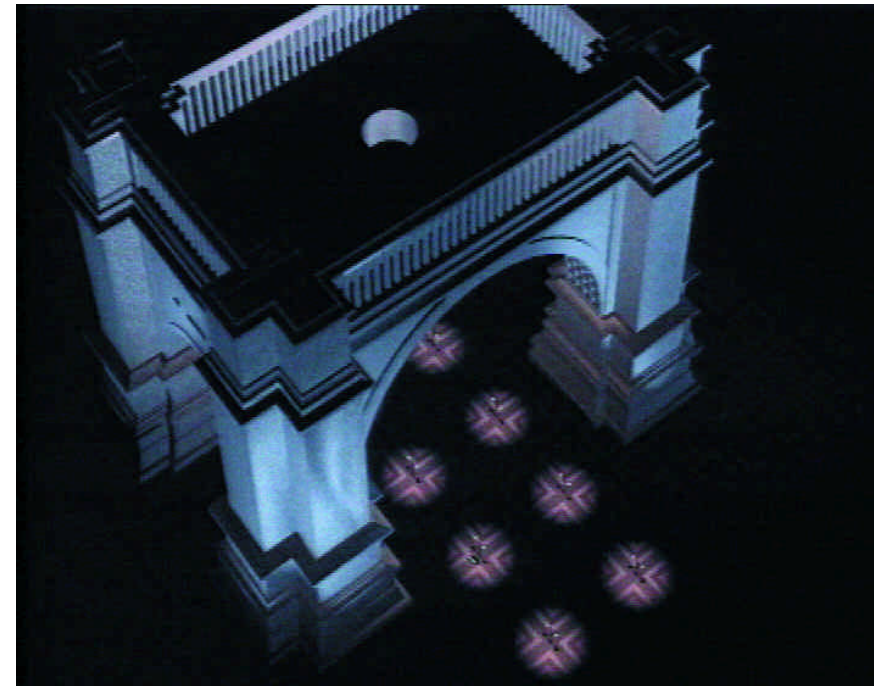


Fig 2 The Great Triumphal Arch of Speer's Berlin at night. This is a video grab, courtesy of Modelbox, hence the slightly fuzzy quality. It comes from the film we made recreating Speer's vision for Hitler's dream city. To give a sense of the arch's size, we inserted footage of a real car driving beneath it. At this scale it is a mere speck, barely visible at all, caught in one of the pools of street light illuminating the ground

authorities such as English Heritage to deny access to monuments that are currently open to the public (tourist-free sites are, after all, a lot easier and cheaper to manage).

But as IBM, for instance, demonstrated in its reconstruction of Dresden's magnificent Frauenkirche, which was demolished by the Allied bombing raids in World War II, virtual heritage provides us all with a valuable way of recovering what we can no longer experience.

The virtual universe's Big Bang

The technologies being developed for building shared spaces or multi-user virtual worlds or whatever you choose to call them are now emerging thick and fast. I am pleased to report that everyone is being extremely co-operative in this enterprise, even now that we have a new contender on the scene: Open Community, from the Mitsubishi Electric Research Laboratory (MERL) in Cambridge, Massachusetts (formerly known as Universal Worlds).

Open Community (www.merl.com/opencom/opencom.htm) does not come from the VRML community (although it will support worlds built using VRML models). Rather, it has its origins in a technology developed internally by MERL called SPLINE (Scalable Platform for Large Interactive Networked Environments). SPLINE has been under development for more than three years. Using it, a virtual world has already been built: Diamond Park, a place "where avatars could travel around a large park, talk to others using

proximity-based voice chat, ride bicycles in a velodrome, create new world views, and play multi-user games".

To create Open Community, SPLINE has been combined with the Universal Avatar initiative (www.chaco.com/community/avatar.html) which aims to provide a standard for avatars so a virtual identity you create for one shared space on the internet could be used in another. The result is a sophisticated-looking application program interface (yes, yet another API) based on Java (yes, yet more Java) that embraces both the network and content sides of social spaces.

It is the fact that Open Community deals with the network side of the social spaces issue which, in my opinion, makes it particularly important because it is the network that makes social spaces unique, and presents the biggest challenge to making them work. The main problem is "latency". As we all know, you don't always get what you want from the internet when you want it. Data floods down the line one minute and dribbles down it the next. The reason for this is that the TCP/IP protocols, on which the internet depends, were not designed to deliver data in real time. They were designed to route things like email, files and scientific data which, generally speaking, one can afford to receive a minute or two later than expected.

For real-time applications, though, latency is a killer and shared spaces are, by their nature, real time. So Open Community promises to provide a set of tools which will

manage this problem. A variety of techniques are suggested, ranging from the obvious (supplying the bulk of the data for a world on CD-ROM) to the ingenious. An example of the latter, given by the authors, is a simulated baseball game. When the batsman hits the ball, and a fielder runs to catch it, the batsman's "client" (the program running on the computer owned by the person controlling the batsman) anticipates where the ball will land, and passes on that information to the fielder's client before the ball has actually been hit. So the fielder's client can show the ball's initial direction even if the information about its actual trajectory is delayed by the network.

As we continue through 1997, I think the collaborative spirit in which Open Community and other initiatives are being discussed means there is a good chance of the industry doing justice to this most significant and exciting of 3D graphics/virtual reality applications. It is nice to start the year on such a positive note.

Render unto Criterion...

In the December issue column, I wrote about the Direct3D and QuickDraw 3D APIs. Who, I and many others were asking, will lead: Microsoft? Apple? Well, as I should have mentioned, for the time being neither will because the real leader is probably Criterion, the British company responsible for the RenderWare API. Criterion, now owned by Canon, claims RenderWare is the market leader. It is certainly popular, and is used in many games and VRML browsers such as Netscape's Live3D and SGI's Cosmo Player. It is fast, too (unlike Direct3D version 2, according to recent reports); you can see for yourself by trying out World Inc's AlphaWorld (www.worlds.net).

PCW Contact

Benjamin Woolley, writer and broadcaster, can be contacted at 3d@pcw.vnu.co.uk