Model behaviour

Benjamin Woolley gets moving on the animation abilities of Autodesk's new 3D Studio Max and Fractal Design's Poser.

Within Autodesk, they called it the "AutoCAD burp". Every time AutoCAD (the world's most widely used CAD program) had a hiccup the whole company would shake. AutoCAD accounted for the majority of the Autodesk's income, pushing all the software publisher's other products and 3D Studio in particular, into second place.

Autodesk has now taken action to cure this bad case of corporate indigestion by setting up Kinetix (www.autodesk.com/kinetix), a division totally devoted to 3D graphics. The man in charge of Kinetix, Larry Crume, says the division's motto is: "We Be Three Dee". And to mark its birth, Kinetix has been given the job of launching one of the most eagerly awaited packages on the computer graphics market, 3D Studio MAX (*Fig 1*).

MAX has been a long time coming; so long that it was the subject of an April Fool's joke in the *Tessellation Times* (Tess for short), an American computer graphics publication. According to Tess, the arrival of MAX was delayed because Autodesk had been in dispute with the creators of the Max Headroom character, over the use of the name.

In fact, the delay had been caused by the usual problems of getting the code (and in particular the renderer) completed on schedule. The finished version finally started shipping at the beginning of May, which is when I got my copy, neatly packaged in a box bearing the Kinetix logo and accompanied by a document entitled "Reviewer's Guide" (designed, it appeared, to steer me towards looking at all the things the software is good at and away from all the things at which it is bad).

MAX has been eagerly awaited by users of the venerable DOS-based 3D Studio, which is beginning to show its age. it was also keenly awaited by the rest of the computer graphics world because of 3D Studio's undoubted impact on the market. The Reviewer's Guide informs me that 3D Studio is "the world's best selling professional 3D rendering and animation system with over 65,000 installations". This might be true. AutoCAD has helped beat a path to the doors of countless CAD departments around the world, in need of a 3D package to help them visualise and demonstrate their designs.

MAX is not, the company keeps saying,

Fig 2 *A sample image supplied by Kinetix to show off MAX's new renderer. By old 3D Studio standards, the sharpness of the highlights combined with the softness of the atmosphere is good*

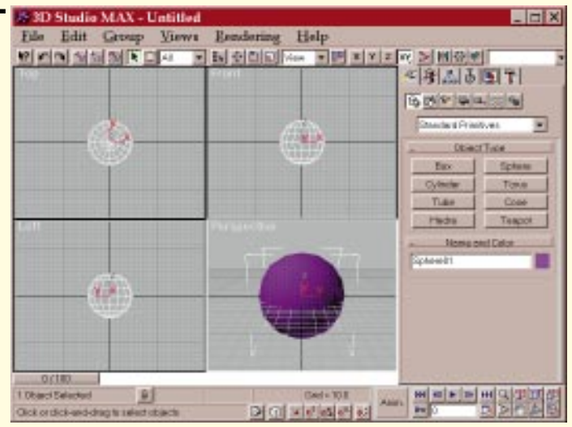

Fig 1 *The MAX interface is "modeless": you do not have to swap between different modes when performing different functions such as animating or modelling*

a new version of 3D Studio (which is still shipping as Release 4). It is a complete rewrite. It runs natively under Windows NT rather than DOS. (It will run under Windows 95, but you get a warning when you run Setup that it may not run properly — this proved to be the case when I tried it). Autodesk will only support NT.

It is structurally different, too, as it uses object-based programming techniques. All the tools in MAX are programming objects

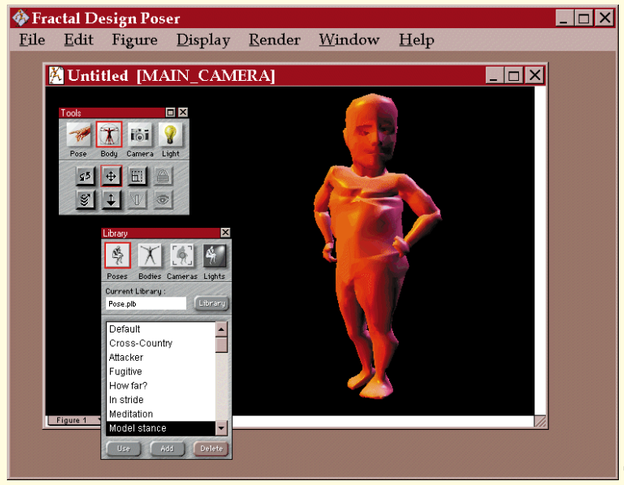

Fig 3 *Poser's interface, showing a rendered baby male figure (the difference from a baby female figure is not obvious)*

— DLLs that plug straight into the operating environment. Every component can be replaced or enhanced, even the renderer.

The renderer supplied is supposed to be an improvement on the rather plastic affair supplied with the DOS version of 3D Studio (*Fig 2*), but even if it turns out to be unsuitable, it will be possible to buy other renderers. Autodesk showed me a ray tracer, being developed by a Scandinavian company, which even in Beta form looked promising

I have only just started to experiment with the package, but one thing that is clear from the start, is that it demands a workstation-class system. My 16Mb Compaq Pentium didn't even come close. The company recommends 32Mb of RAM, a Pentium Pro (or two — MAX supports multiprocessor configurations) and graphics acceleration.

The key to MAX's success will be its object-orientated architecture. All registered users will be entitled to the Software Development Kit so, if literate in C++, they will be able to produce their own extras. A few plug-ins (no longer called IPASes) are already available — for example a VRML converter — and loads more are promised.

Character building

One of the most eagerly awaited MAX plug-ins is Character Studio, which comprises two tools: Biped and Physique. Judging by a brief demonstration of these, it looks as if they will provide a powerful system for animating humanoid characters. Biped is particularly interesting as it allows you to animate a mannequin simply by establishing the position of its footprints. You string a series of prints out on any surface and watch Biped work out all the steps, including ones that traverse stairs or uneven terrain. Character Studio is likely to cost several hundred pounds when it is released later this year.

A simpler and cheaper alternative is an intriguing product from Fractal Design (www.fractal.com), the company that brought us the excellent Painter 4 bitmap editor (see *Hands On*, June). Called Poser, the package comprises meshes for human figures, a library of poses that these figures can strike and tools to manipulate both figures and poses.

The elements that make up the figures are hierarchically linked (in the words of the old song: "The thigh bone's connected to the knee bone, the knee bone's connected to the shin bone…"), and these linkages contain an element of what the pros call inverse kinematics. When you move the hand, for instance, the rest of the arm follows in a way that is roughly equivalent to the movement of a real arm.

Despite these aids, manipulation of the figures can still be tricky, and I was soon forcing my unfortunate mannequins into bone-breaking contortions. The figures themselves are quite simple: you can have male or female, in sizes ranging from baby to "super-hero", and there is a library of poses, such as "fugitive" and "thinker".

In *Fig 3* you can see the baby male figure. Its mincing pose is one of those supplied in the library, entitled "model stance". The baby has been rendered using Poser's own renderer. This allows simple textures to be applied to the models, such as clothing (though it always has to be skin tight). Note that the baby, like all the models, is anatomically incorrect in certain vital respects.

Poser's real potential for serious 3D users is for creating and posing models to be imported into other 3D packages. Unfortunately, the only 3D output formats are DXF and RIB (the Pixar Renderman format). DXF, essentially a CAD format, is common but crude. The file format does not contain mapping co-ordinates, which is a shame as all the Poser figures have mapping properly applied while used within the package (a texture map wraps around the figure no matter what pose it strikes). Poser is a nicely designed and well documented package, and if other file formats were included (the 3DS format, for example), it would be extremely useful.

Memory palace

In previous columns I have mentioned a project that I play with in my spare time entitled the "Memory Palace". My use of the term provoked the interest of a reader, Alan Mackay, a professor at the University of London. Memory Palaces were a medieval invention. They were not real buildings, but imaginary spaces created by story tellers in order to remember the sequence of events in a long tale. The tale would be broken up into rooms, each of which contained objects representing events in the story. By mentally retracing their steps through these rooms each time the story was told, the teller would recall the sequence of events.

The secret of a good memory palace is to make the rooms and the objects they contained as memorable as possible, which in medieval times meant filling them with violent and sexual images.

Nowadays, literacy is a little more widespread than in the days when memory palaces were created to help people retrace a long story. But as Mackay had noticed, the idea has applications to the way we store and retrieve information in our burgeoning disks and networks.

What if a system were represented not as a boring old office but as a palace made up of rooms containing striking icons and lurid objects representing the information the system can access? What if navigating the Web was not a matter of URLs and home pages, but a trip through an endless gallery of fabulous rooms, each furnished with objects acting as pointers to particular area of interest?

Several years ago, Mackay proposed a research project looking into some of these ideas, but the funding body for computer research at the time was not interested. Perhaps now is a good time to have another look at the issue.

PCW Contacts

Benjamin Woolley, writer and broadcaster, can be contacted at **woolley@illumin.co.uk**. His home page is **www.illumin.co.uk/woolley/**