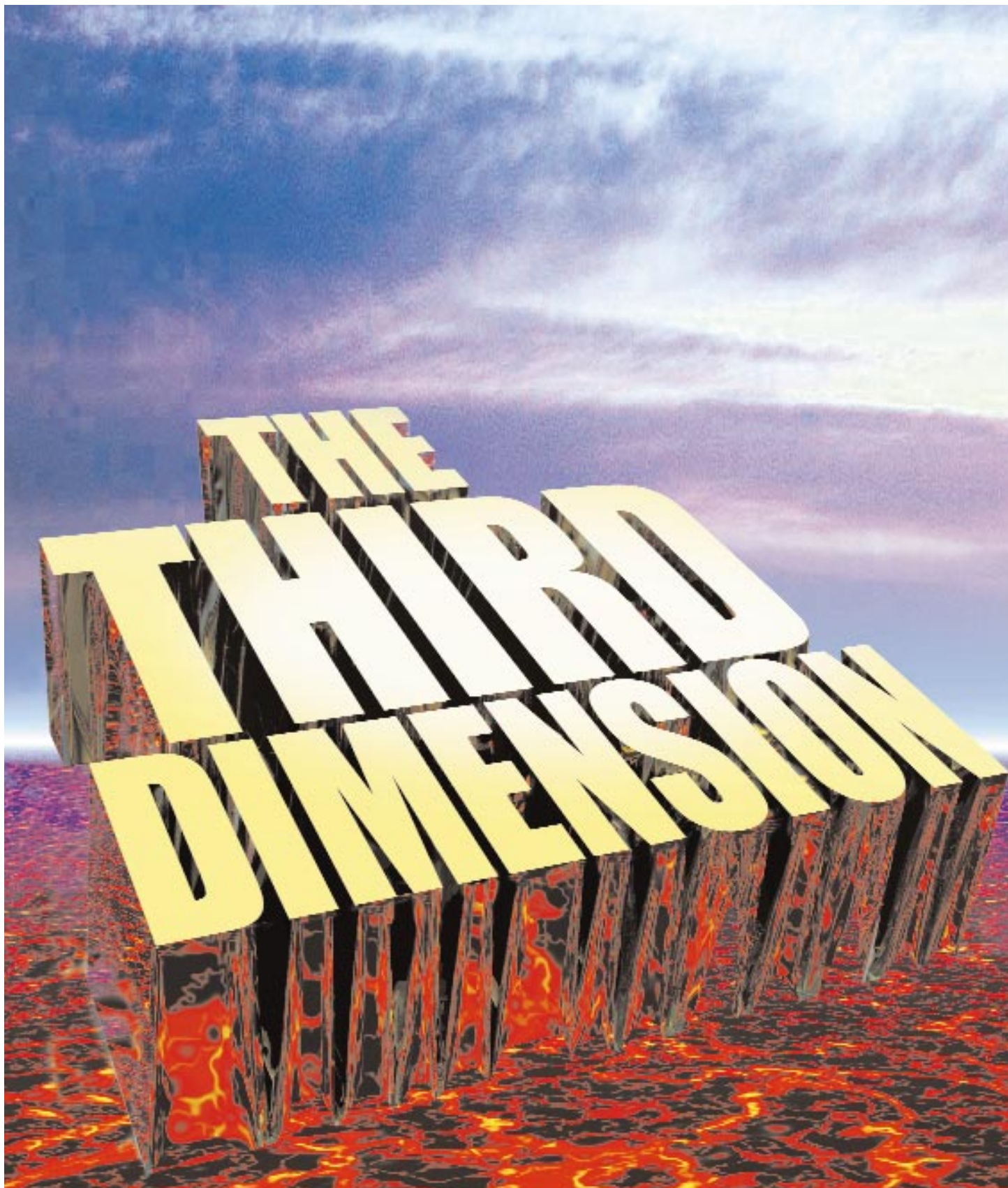


software

Comparison Test





IN TEST: FIVE 3D MODELLING AND ANIMATION TOOLS

The latest generation of 3D modelling and animation tools brings an unimaginable amount of creative firepower to your PC. Choose the right application, and you could be having a blast!

More than two decades ago, George Lucas used miniature models of wood, metal and plastic, to create the incredibly detailed cityscapes in the vastly acclaimed *Star Wars* trilogy. In the mid-90s—computers completely dominate the visual effects aspect of filmmaking. Using digital wizardry, Steven Spielberg creates giant dinosaurs, which roam the Earth in *Jurassic Park*. James Cameron recreates the glorious *Titanic*. And, coming full circle, the cult-classic *Star Wars* itself is re-released after being digitally reworked, with computer graphics elements added (remember Jabba the Hut?) to the original footage of 1977 vintage.

Compatibility, capability, cost or convenience?

PC-based 3D modelling packages available today cover the entire gamut of capabilities—from low-end budget-priced packages, which can be used to create simple ‘flying logos’, to hyper-expensive hi-end packages, which can create an entire virtual universe populated by virtual characters. In the spectrum of packages tested here, the awe-inspiring 3D StudioMAX2.5 (Rs One lakh) represents one extreme in cost and complexity, whereas Ray Dream Studio 5 (Rs 12,000) represents the other end. Various other packages cater to the different price-performance points in between.

How do you choose the right 3D tool for you?

Simple. It depends on what you actually want to accomplish, the learning curve which you are

prepared to ascend, and, well, the amount you are willing to spend. If you are a serious animator, working with a large team of people and using multiple applications for fine-tuning your creations, you will be better off with a high-end package that offers the option of importing and exporting files in various formats. You will also get features like batch-rendering and processing, which will allow you to use a ‘rendering farm’ (multiple machines on a network that render pre-allocated frames of an animation). Finally, high-end packages also have powerful features for dealing with digital video, which is often composited with computer-generated animation.

For casual hobbyists, these features won’t mean much—you should look at low-to-mid-end applications, which will help you create anything you can dream of, at a price that will not give you nightmares.

CHIP TEST PROCESS

All the applications tested here are for the Windows 9x platform, except for 3D StudioMAX2.5 (which is actually meant for the Windows NT platform, but runs on Windows 9x anyway, after issuing a dire warning!) A 300 MHz Pentium II, with 64 MB of RAM, was used for the tests. The applications were judged on the basis of features (the kind, and the number of modelling and animation tools available, for example), ease of operation, stability, the ability to work in shaded mode in real-time, availability of plug-ins, and the quality and speed of rendering.

trueSpace4.1

True value for money

Introduced in 1994, Caligari trueSpace, in spite of being a very capable tool, has been something of a dark horse in the world of 3D. trueSpace4.1 has the most unusual interface among all the applications tested here. The interface allows animators to work in an intuitive, organic way, rather than the stiff and structured approach employed by some applications. In the new version, Caligari has added many features such as real-time rendering of 3D objects, 3D Boolean operations, and video rotoscoping.

The best thing about trueSpace is that despite its formidable capabilities, the user does not have to scale a very steep learning curve. The unusual, single-window interface actually helps in decreasing the intimidation factor (most new users get put off



The interface allows animators to work in an intuitive, organic way

by the 4-window interface used by other 3D applications), and helps new users maximise productivity from the start. Screen space is utilised to the maximum—interface control elements have been incorporated into the 3D design space, and '3D widgets' (resizable 3D toolbars) replace traditional elements such as dialog boxes, buttons, and sliders.



trueSpace4.1 comes with a powerful set of tools and features. There is the usual set of primitives (torus, sphere, cone, cube, and cylinder), it is also possible to work directly on NURBS (non-uniform rational b-splines) surfaces, and deform NURBS objects interactively.

'Metaballs', which allows the user to



combine a special set of geometric primitives, whose shapes 'flow' into each other, is a new feature. Using Metaballs, you can create objects that would be difficult to model by any other means. This feature can also be used to create animations where objects blend together and separate dynamically, depending on their relative distances (for example, the T2 character in *Terminator 2* who formed himself from blobs of metal rolling on the floor).

Equipped for the job

Tools like Sweep/Macro-sweep, Deform, Lathe, and Bevel, allow objects to be modified in real-time, and permit interactive user control over all object parameters. Multiple selectors, such as lasso and rectangle, allow you to select targeted object groups as well as sub-objects, and object faces, edges, or vertices for deformation.

For character animation, trueSpace4.1 has a good 'Bones' utility for easily creating and animating the skele-

ton of a 3D character. Although a step below the best character animation systems (like the Character Studio plug-in for 3D StudioMAX), the trueSpace Bones system allows animators to bend any object realistically, with surfaces being deformed accordingly.

trueSpace4.1 comes with support for

Direct 3D, OpenGL, and even Intel's 3DR API standard. The quality of rendering is good. A new feature called 'Radiosity' enhances realism. Raytracing 3D objects gives good results, but it takes radiosity to calculate how different types of lights (sky lights, local lights, infinite lights, spot lights, and so on) affect a virtual world. Using this feature, scenes are rendered in accordance with the real-world physics of light and shadows, and the results are spectacular!

Using trueSpace4.1 might be a little disconcerting for people used to the usual 4-window interface, but it impresses by its excellent functionality, user-friendliness, and price-worthiness.



Infini-D 4.1

Ideal for beginners

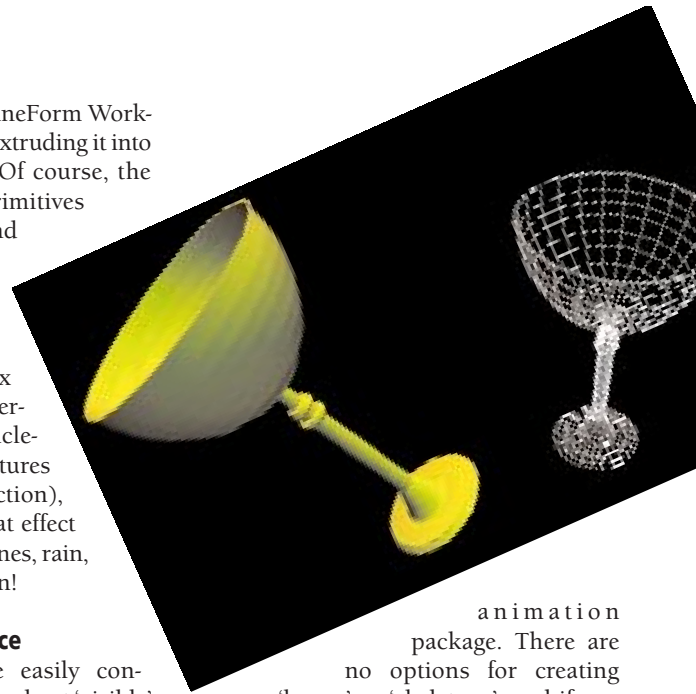
Infini-D from the MetaCreations camp is a very competent, yet easy-to-learn tool. Sure, ILM (Industrial Light and Magic) would not be using it anytime soon, but then the average Infini-D user does not usually harbour ambitions of creating the next Hollywood blockbuster. What Infini-D does offer is ease of use—novice users can learn the application in a short time, and can start working right away. After all, not all of us want to read four encyclopaedia-like tutorials before we can animate our first 3D model.

Even though this package is not ideal for creating complex, organic objects, or animate detailed humanoid models, it is ideal for creating broadcast-quality 'flying logo' kind of animations. (With version 4.1, MetaCreations has introduced some features relevant to broadcast needs, like

using pen tools in the SplineForm Workshop, and then lathing or extruding it into three-dimensional form. Of course, the standard array of 3D primitives (cubes, spheres, cones, and cylinders) are all there and accounted for, and they can be suitably modified and linked together to create complex objects. There is even a terrain generator, and particle-emitter system (which features automatic collision-detection), which can be used to great effect while creating outdoor scenes, rain, snow, waterfalls, and so on!

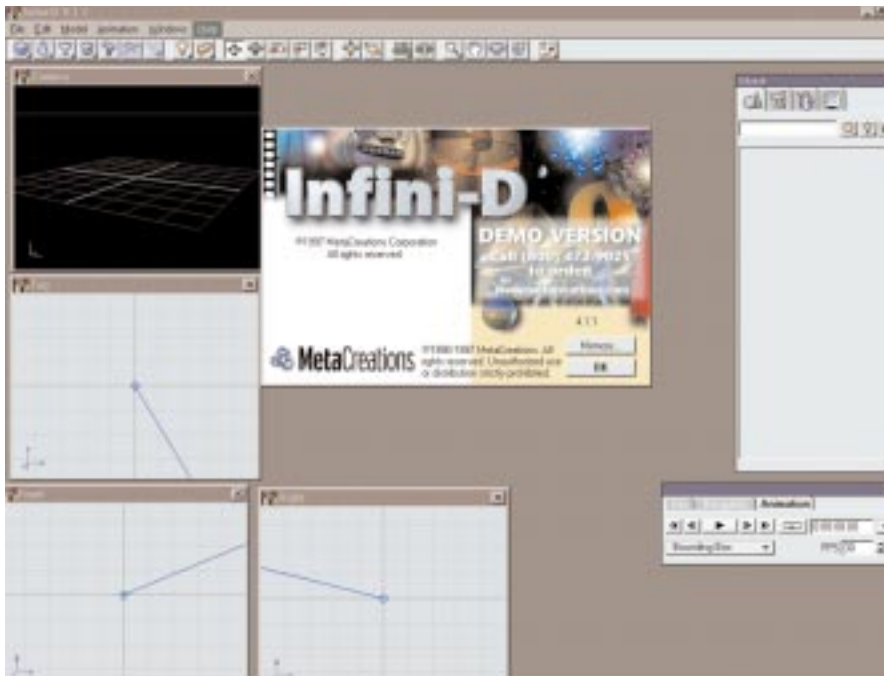
An animated performance

Lighting parameters are easily controlled. Light sources can be kept 'visible' or turned off, and they can be animated like any other parameter in Infini-D. Using the timeline 'Sequencer', it is easy to animate your 3D models (or lights, or scale deformations) over a period of time, with



animation package. There are no options for creating 'bones' or 'skeletons', and if you do manage to assemble a humanoid creature, do not even think about goodies like inverse kinematics or skeletal deformations while animating it.

Though easy to learn, this package is not ideal for creating complex, organic objects



broadcast-safe colours, field rendering, and non-square pixel support.) Anyone with some 2D imaging experience (with no experience of working in a 3D package) can start working in Infini-D almost immediately. Creating a 3D object can be as simple as drawing an outline in 2D,

a very high degree of precision. Those who abhor any kind of hard work, can make use of Infini-D's 'animation assistants' to create and automate typical 3D moves such as banking, zooming in or out, and spinning around an axis. Remember though, that this is, essentially, a low-end

While it is a capable 3D package, Infini-D does not make a mark as a true professional grade package. The mesh-editor, for example, lacks precision—you must deform entire surfaces, or pick individual points—the capability to select and modify 'faces' is missing. Likewise, volumetric lighting, explosions, fire, and other such accoutrements, which go with the best 3D packages, are missing. Also, rather surprisingly, Infini-D was very slow on the test machine. It did not work in the flat-shaded mode, in spite of using an Intel 740i (with 16 MB RAM) graphics accelerator. Nevertheless, Infini-D is a capable package, which can get you off to a good start in the world of 3D.

Bryce 3D

VERDICT **B-**

- Simple interface, easy to learn
- Lacks advanced animation controls

Price: Rs 24,000
Contact: www.metacreations.com

Your chance to play God

Take everything you know about working with 3D modelling and animation packages. Now throw it all out of the window, and start all over again. Bryce 3D, from MetaCreations, is Radical, with a capital R. No matter how long you have been working with computer-generated 3D art, Bryce 3D forces you to reconsider your notions of what a 3D package should be.

In the MetaCreations tradition, the user-interface is completely different from that of any other 3D package, and looks like it was designed by a team of people whose staple diet included double dosages of Rhino tranquiliser. The standard toolbars, buttons, icons, and menus of 'normal' Windows applications are eschewed in favour of a completely outlandish, organic, three-dimensional look. Glitz notwithstanding, the very unusual interface actually gets in the way of productivity, which is unfortunate. Work-

you have to be a master at the art of 3D modelling to get results.

You are provided with the ultimate in drag-and-drop functionality. Choose from a vast library of terrain, mountains, rocks, trees, skies, lights, fog, and any other environmental parameter you can think of, modify them any which way you want, and simply put all the elements together! Bryce 3D even has animation capabilities, so that your world does not have to remain static. Basic keyframe animation controls are found at the bottom of the main workspace and are also found in both the Terrain Editor and the Materials Lab. Creating walkthrus and flythrus is a breeze in Bryce.

Bryce's Advanced Motion Lab displays animation tracks for the individual properties for each object, which allows you to fine-tune the duration of an event by adjusting curves in the Time Mapping Curve Editor. You can also set the parameters for volume materials (such as fire), true volumetric lights that interact with

need not worry though—Bryce has enough functionality built into it that you will not tire of it for a very long time, even if you use only the presets, and drag-and-drop functions.

Overall an excellent package, Bryce 3D is let down by its interface. It is interesting, but hampers productivity. One would rather have a staid interface that works quickly and efficiently, rather than one which looks cool but hampers work. Bryce 3D can render AVI and QuickTime movies, but be prepared to take a nap when you start rendering your work—things are slow enough to give a snail a complex(!)—even though the results are worth the wait. If you plan to run Bryce 3D on your PC, make sure it is at least a PII, and stuff it full of as much RAM as your bank balance allows. When it comes to creating new worlds, Bryce 3D comes second only to God.

3D StudioMAX2.5

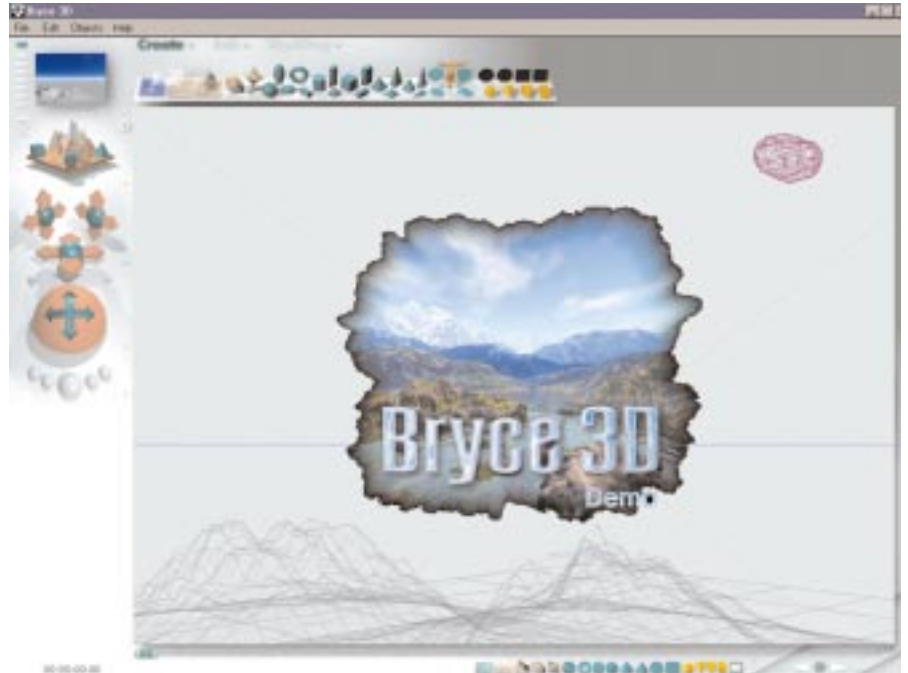


Creating walkthrus and flythrus is a breeze in Bryce

ing in Bryce 3D can be almost like setting out on a treasure hunt—you never know which hidden feature you are going to stumble upon next.

Alice in Wonderland

Bryce 3D is unlike any other 3D application in more ways than one—it allows the user to create complete virtual worlds, with surrealistic mountains, lakes, trees, and what have you, in awe-inspiring, ray-traced, Pentium II-generated detail. And

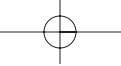


one another, and atmospheric effects (such as rainbows). Do note, however, that only professional artists and animators will be able to venture to the rarefied realms of the Advanced Motion Lab, and the Texture Editor, as these are highly complex, and their use is made more difficult by the 'unusual' interface. Novices

VERDICT **B+**

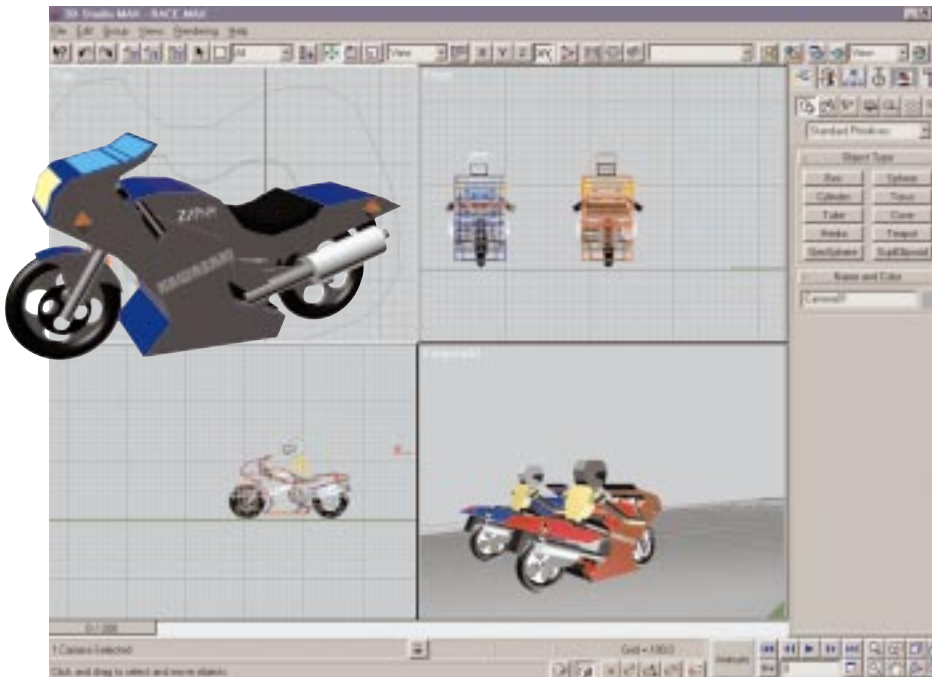
- ✦ Excellent for building and animating virtual worlds
- ✦ Lacks general-purpose functionality, interface hampers work

Price: Rs 8,000
Contact: www.metacreations.com



The best of the best

MAX2.5 is not only one of the most powerful, it is also one of the relatively easier packages to learn. The interface is elegant, with a logical placement of tool-buttons, menus, and parameter-option windows. The package has a very intuitive feel to it. It comes with four thick user manuals, so don't expect to start working on your magnum opus right away, but that said, users can attain speed fairly quickly in MAX.



Master of the game

Although MAX is basically meant for Windows NT, it will, after giving you a rather ominous warning, agree to run on Windows 9x. There is support for OpenGL as well as Direct3D, and one modelling 'seat' (a single installation) can run up to 10,000 render stations over a TCP/IP network.

At the very outset, we will admit that MAX has simply too many features for all of them to be mentioned here. Thankfully, in MAX2.5, as in its predecessors, modelling is easy—dozens of primitives are supplied as standard and all of them can be modified incessantly. You can edit an object by its mesh, patch or spline, and best of all, the modifier stack (which stores a 'history' of all changes and modifications to an object) allows a user to go back in

time, and undo, or modify, any change in modelling parameters. Support for NURBS objects helps you to create very organic-looking objects.

The various particle-systems can be used to simulate rain, snow, dust, or smoke. You can also create various complex boolean objects, and animate the parameters for a dramatic effect. Almost all parameters in MAX can be animated—lights (including volume lights), scale and loft deformations. MAX also accepts animated texture maps, which means you can

capture and digitised video footage, with live 3D animation, and generate various 2D image effects like glow, lens flare etc. It can also be used to generate cross-fades between various cameras in MAX itself. In conjunction with the Track view, Video post can be a very effective tool.

The new Camera Tracker tool allows a user to set up and animate a MAX camera in accordance with a real-world camera. This feature is useful when incorporating a computer-generated creature into live video footage. MAX2.5 can also interface with motion-capture equipment, and you can map captured motion on to any computer-generated character, modifying motion capture data in real-time.

MAX2.5 has comprehensive support for various file formats—not only can you render stills and movies, you can also export your work as a VRML97 file, which enables anyone with a Web browser to view your work in all its 3-dimensional glory.

Using MAXScript, the die-hard programmer can build interfaces to external systems (like motion capture control software) which support OLE (Object Linking and Embedding) automation. And if you do manage to get in a jam (and, sooner or later, you will) there is always the very

MAX2.5 can also interface with motion-capture equipment



apply an AVI movie as a 'texture map' over any 3D object.

Endlessly capable

Animation controls are easy—a simple timeline-based sequencer allows you to keyframe your animations, and for advanced level control, you can use the Track View window to adjust parameters (such as speed and duration) for individual objects in the scene. Objects can be animated manually, or be assigned a spline-based path. Like everything else in the package, animation in MAX is quick and efficient.

Since many 3D experts need the cross-functionality of a video-editing suite and a 3D modelling application, we have, in MAX, the Video Post. Using Video Post, users can composite pre-rendered, or

comprehensive MAX Help to turn to.

3D StudioMAX2.5 is the software to buy if you are a professional. For novices, it is overkill, but those involved in film production or game development cannot afford *not* to use MAX.

VERDICT **A+**

- ⊕ Highly advanced animation controls
- ⊖ Expensive, steep learning curve

Price: Rs 1,04,000
 Contact: RGB Systems and Support
 Phone: 022-6328161
 E-mail: rgb@om3.vsnl.net.in

Ray Dream Studio 5

Hard to learn, difficult to use

To begin with, Ray Dream Studio 5 has a very confusing, difficult-to-work-with interface. Once you are comfortable with the package, you find that there simply aren't enough tools and features to keep you interested for a very long time.

Ray Dream Studio is all about using wizards and templates, and playing mix-and-match with the wide range of pre-built 3D models supplied, rather than creating something from scratch. For those who would rather create their own 3D objects, there is a free-form modeller, but again, it is difficult to comprehend and use. Unless you are a pro, do not expect to create complex 3D models using this modeller. Going through the comprehensive tutorial helps, but 'intuitive' is the last word most people would use to describe Ray Dream Studio.

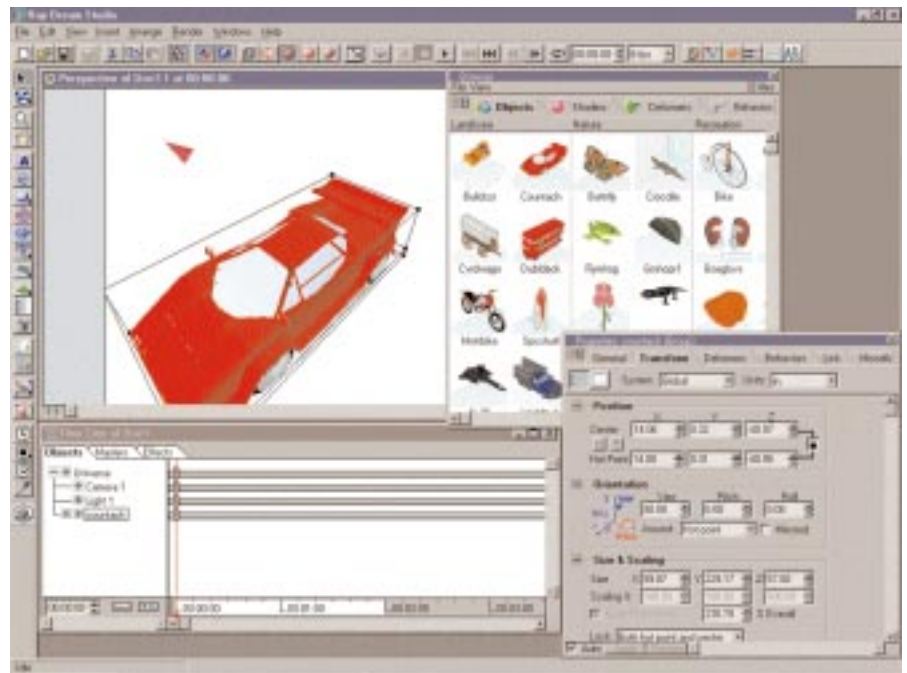


Ray Dream Studio is all about using wizards and templates

These behaviours mimic real-world forces such as wind, gravity, and friction. There is also collision-detection for added realism. However, the complicated interface makes it difficult to create convincing animation sequences.

The quality of raytracing in Ray Dream is exemplary and is the only saving grace of the package. It needs large amounts of

difficult a learning curve for novices, and the application simply does not have a set of features which can engage professionals for long. Its animation capabilities are better than its modelling capabilities, but the only thing it does well is render stills. So where does that leave Ray Dream Studio 5?



Fools paradise

Limited modelling capabilities apart, Ray Dream Studio has just about fair animation capabilities. Some 'Behaviours' (like 'bounce', 'gusty' and 'caren') provided with the application allow the user to create fairly realistic animations.

RAM, and is slow but the results are worth the wait.

In the final reckoning, Ray Dream Studio 5, which supports QuickDraw 3D as well as Direct 3D, but not OpenGL, is a bundle of contradictions.

The quirky interface presents too



CHIP CONCLUSION GO FOR MAX SATISFACTION

For animation and CG professionals, 3D StudioMAX2.5 is the software to have. It is definitely the BEST, by far, if you put pure performance over everything else. A treasure trove of advanced CG functions, it can be expanded endlessly via plug-ins, has comprehensive modelling and animation tools, can run customised MAXScripts, and can handle various file formats.

But what if you are an eager novice? You probably cannot afford to rustle up the hundred thousand odd rupees, which is the asking price for MAX, and you might feel intimidated by the kind of learning

curve which MAX would require.

If this is the case, you are a prime candidate for trueSpace4.1, which would allow you to do almost anything that the top guns can do, at a fraction of the price. As a bonus, it is easy to learn, and has an intuitive, user-friendly interface to boot.

Finally, if you are in the market for an application that allows you to create and animate awe-inspiringly real virtual worlds, get Bryce 3D. It has a rather quirky interface which you will take some time getting used to, and it does not really have general-purpose functionality as a 3D tool, but as

a landscape generator, it has no peers.

On a last note, remember that it is the artist who matters the most, not the brush. All the applications tested here will, more or less, get the job done to some extent, provided you are tenacious enough. Most of these applications are available as demos, so try them out, and choose the one which you feel the most comfortable with.

SAMEER KUMAR