



NavisWorks

This interactive viewing application, which can be used on any standard PC, is an innovative step towards allowing easier communication of 3D data between team members, wherever they are in the world, says Myles Cummings

It was good to see that (UK) architecture graduates are now really beginning to embrace CAD and Cgi. However even for a CADist like myself there is no getting away from the fact that the best way to 'sell' a scheme is still with a seductive physical model. I'm happy to report that there is no shortage of these either, beautifully constructed in crisp white foam board. The beauty of a real model is just that, - it is 'real' as opposed to virtual. You can walk around it, explore it from different angles, choose your view, get right up close, or see the bigger picture. Architects like models for all these reasons, and clients like them even more.

This level of real-time interaction with a computer generated model of any size, simply isn't an option unless you or your client (preferably both) have access to an SGI Onyx machine or the Centre For Advanced Architectural Studies at Bath. Both of these options are expensive and at least one of them puts a trained operator between you and your model. But, in true 'Tommorows' World' style all this may be about to change with the arrival of NavisWorks.

Essentially, NavisWorks is a utility application which, allows you to interactively view any 3D model of any size on any desktop PC. Developed by LightWork Design in Sheffield, this software will accept 3D model files

QUICKVIEW



NavisWorks

NavisWorks

www.lightwork.com

Quality of interface:

1 2 3 4 5 6 7 8 9 10

Ease of learning:

1 2 3 4 5 6 7 8 9 10

Level of integration:

1 2 3 4 5 6 7 8 9 10

Value for money:

1 2 3 4 5 6 7 8 9 10

Overall satisfaction:

1 2 3 4 5 6 7 8 9 10

Reviewed with: 486

Pentium II PC, 233 MHz,
6GB hard disk, 128Mb

RAM, Matrox video card

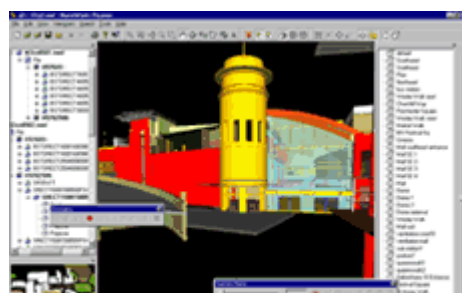
Average seat price:
£3,495, including all
modules (ex VAT)

NavisWorks 1.3 modules:

Single seat of
NavisWorks Roamer:
£300 (ex VAT)

NavisWorks Publisher
£950

NavisWorks Clash
detective £3,495



containing hundreds of thousands or even millions of polygons from AutoCAD, ArchiCAD and MicroStation which you can navigate around in real time on a standard PC. With NavisWorks, the whole design team - from the client in the boardroom in Boston to the architect in the drawing office in London to the project manager on site in Sydney - can review the current design in 3D without an Onyx server in sight.



It's a simple, straightforward concept, and it's perhaps rather surprising that NavisWorks, the first and apparently only software of its type currently available, has taken this long to appear on the market. That aside, does it do what it says on the tin, and how easily does it do it?

The tin itself is an attractively packaged box containing an equally attractive manual in a hard backed ring binder form, along with the software on installation CD-ROM. There are several modes of installation to choose from all of which are more or less self-explanatory. A compact installation installs only the Navisworks component files - Roamer, Publisher, Clash Detective and help files. A 'typical' install includes all of these plus AutoCAD and MicroStation plug-ins which allow export from these packages into the Navis file format. A 'full' install is the same as a typical installation including tutorial and online manuals. A 'custom' install allows just about any combination of the above.

Installation

On installing NavisWorks you are effectively working in a 30-day evaluation version of the package, which you can opt to license to the full version at any time. I am not clear as to the reasoning behind this approach. To me, it almost portrays a lack of confidence in the product and quickly found the 'do you want to License Navisworks Now?' dialogue box rather tiresome; particularly as it didn't appear just once at the start of a session but popped up each time I opened a new project.

The licencing system itself, should you decide to purchase, is available in two flavours - fixed and floating. The former being associated with one machine only and the latter for use on a server and able to 'float' between different users over a network. The floating option is obviously of much greater interest to larger companies who can then allow multiple users in the office (or elsewhere) access to the software on as as needed basis.

When you first boot-up NavisWorks, it's the Roamer interface and environment which fills your screen. The interface is attractive, clean and simple, and can be split, configured and arranged to suit you. Essentially, NavisWorks is a viewing utility and cannot therefore create 3D models or elements. To start, you either open an existing NavisWorks Design (NWD) model or import and convert a 3D model from another source. I began with some of the example files on the CD which included a model of the city of Bath and several large chemical plant-type examples. (Providing models all have the same origin point and base unit, they can come from different CAD systems and be assembled together in NavisWorks. Although DXF is still the common denominator.)

Depending on the size of the model it takes anything from a few seconds to 1/2 a minute for the for the program to load the requisite data, but it's

impressive that it can do so at all. These are very large models of several hundred thousand polygons that ordinarily would bring my machine to it's knees if I attempted to open something similar in say 3D Studio Max, but neither NavisWorks or my humble 486 seemed perturbed by these huge chunks of data.

Best of all though, and even more surprising, is the ease with which I can then navigate around and through the model. The instruction manual is almost redundant, as for once it really is intuitive and straight forward to find your way around and start looking at the model from all manner of viewpoints, and all in a reasonably smooth real time interactive way.

Basic tools

The two basic tools which allow you navigate around the model are walk and fly. As in life, walking is the easier and less likely to end in disaster, but flying is more exciting. Clicking on the walk tool and then holding down the mouse walks you through the model on a horizontal plane, ensuring that 'up' is always 'up' (although the user can also redefine 'up' to match any axis). Holding down the shift key while walking allows you to take bigger steps and the control key allows you to pan left and right. This control/shift key combination is also used on other tools to allow greater interactivity on the fly. Flying is slightly trickier to master, as the camera banks left and right to match your flight path, and the flight speed is a good deal faster than walk mode. However if you do muck up and get completely lost, a click the ever so useful view all tool instantly takes you back to the bigger picture.

The dozen or so remaining navigation tools, are intuitive and all allow greater degrees of control over the nature of the view on display. The focus tool, for example, as its name implies allows you to click select a part of the model making it the central viewpoint, and the point clicked is the focal point for using the examine, orbit, and turntable tools. You can reposition individual elements of the model using the hold, and interactively define section planes with the tool of the same name. There are also the usual pan, orbit, and zoom options common to any 3D user, and an a selection of tools for straightening the camera, and/or aligning it to different axes.

As well as the main view of your model, you can split the NavisWorks screen to suit your way of working and to display thumbnail views of the model in both cross-section and plan view. These incorporate an arrow marker indicating your current position and direction of view, and you can also click and drag on this to move around your model.

So far so good. OK, the views are shaded, not photorealistic rendering, or if you prefer you can work in wireframe or hidden line modes. There is some polygon drop out as you move through the model in a manner similar to that seen on some racing style arcade games. However, as soon as you stop moving, the model shading completes in a couple of seconds. The extent of drop out depends on the viewing frame rate, model complexity and the specification of your PC. OpenGL is supported and this apparently improves performance although it is not considered essential. Although polygon drop out is to some extent unavoidable, you can assign which parts of the model are mandatory ie not dropped. Changing the frame rate to a lower value also creates less drop out but at the expense of a jerkier movement around the model.

Recording

Recording your flyabout/walkabout animations in NavisWorks is also a

doddle. You can either record your flight path as you create it or establish and save defined viewpoints (complete with a window for design notes and comments). These viewpoints can then be pieced together in any order to form an animation sequence from one to the other, and the resultant motion can be recorded for viewing internally within Navisworks, or exported as separate avi file for viewing in any media player.

Having proven itself as a powerful tool for navigating large models I then tried out the other major function of the program which its creators have imaginatively called the The Clash Detective! This is a separate option which can be run on any model brought into NavisWorks, but is useful for developing of large complex designs, eg. process plants where many intersecting pipes and other elements are encountered, and particularly large 3D models are common. The clash detective lists any clashes found in order of severity and these can be automatically highlighted on the model. When a clash is selected it will automatically be positioned in the centre of the view, for easier examination and, if required, the remainder of the model can be greyed or hidden. Once set up, a clash test can be re-run as often as required, singly, or in batch mode. You can reset the tolerance settings and run both hard and soft clash tests. NavisWorks creates a so-called audit trail for the life of the project. which indicates test runs, results, approvals, dates, etc. This information can be saved as a separate text file as required, perhaps for emailing to other members of the design team. Which neatly brings me to the final arrow in the NavisWorks quiver. The 3D mail option. This is a very straightforward tool which integrates Navisworks with existing email application, allowing you to exchange 3D information with other user's. Clicking on the send tool icon accesses your email application and sends the file to the recipient as an attachment in NWF format. The catch here is that the recipient must have access to the constituent NWD files which contain the model data. The NWF files act as pointers to these files. If the recipient does not have, or cannot, locate the NWD model they will be unable to see anything. The only way around this is to send them the requisite NWD files as attachments, but you will need to do this manually within the email application.

Still, all things considered, the software was extremely stable and, as mentioned earlier, was able to cope easily with large models - even on my clapped out 486. AutoCAD and 3dD Studio Max files were easily imported and converted to the NWF file format. However, I was less successful with DXF files exported from a variety of packages (most notably InfiniD.) As I hinted earlier, the 3D email function is not quite as comprehensive as it ought to be and there has to be a very strong case here for allowing the creation of some kind of standalone project specific exe. along the lines of a Macromedia projector files which allow users to view movies without the necessity for the full software being installed on the machine.

Imagine how nice it would be to simply email your client a self contained NavisWorks model for them to peruse at leisure without them having to persuade fork out the necessary £1k for software which they might only occasionally use! In fact come to think of it, I reckon quite a few users who might have more than occasional use for this kind of software are going to be deterred by that same £1k, - after all, you can buy some fairly high end 3D modelling packages for that kind of sum these days.

Conclusion

Starting at £1,000 (ex-VAT) for the basics, NavisWorks may be a little high

in price to gain immediate mass acceptance - for what might be considered to be glorified viewer with add-ons. Overall though, this is a fine British product. There's nothing else like it available and it is a useful package and is certainly a welcome step in the right direction in allowing the easier communication of 3D data between design team members be they in the same office, or on opposite sides of the world.

It's intuitive to the extent that even a novice user should have little trouble in finding their way around a 3D model, and the more advanced features like the clash detection operations are also straightforward in operation. If you do have a query the online help files are well structured and the supporting documentation nicely produced, with easy to follow tutorials.

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