Get real

State-of-the-art virtual reality techniques developed for the medical profession are being exploited by construction as well, writes James Macneil.

Virtual reality in a cinema setting, as in the Nottingham Centre for Industrial and Medical Informatics, will enable clients to take a virtual stroll around a building, and gives them an early involvement in the design process.

TO THE UNTUTORED OBSERVER, there are few obvious similarities between the construction industry and the medical profession. But a new facility that opened in January on a science park attached to Nottingham University is being shared by experts in both medical imaging and building design.

Despite their different professions, both groups need access to state-of-the-art, high-powered 3D computer design systems, and the Centre for Industrial and Medical Informatics can provide them.

The centre is equipped with the latest Silicon Graphics computers, an advanced projection system and a floor-to-ceiling curved screen. Sitting in the room watching images of CAD models projected on to the screen is like sitting in a mini cinema.

Images to order

The difference is that, rather than being fixed on a piece of celluloid, the images are generated to order. As the computer operator moves a cursor around the model, the view is generated instantaneously on the screen. Viewers can ask to turn left or right as they move through a virtual building, and the image will immediately respond.

This facility is not the first of its type in the country. A similar centre at the Cambridge-based CadCentre opened a year ago, and London is set to follow suit soon. These centres mark a trend towards using virtual reality as a collaborative working tool.

Early images of virtual reality required wraparound headsets. For the construction industry, this vision of offices full of Robocop look-alikes has not materialised; one hindrance being that the technology is not wholly satisfactory.

George Stevenson, chairman of Engineering Technology, a firm that specialises in developing high-tech computing applications for the construction industry and a backer of the Nottingham centre, explains: "Many headsets rely on camcorder technology to generate the images and the quality is not particularly good. They can also be quite disorientating."

Equally important, the immersive interface inhibits collaborative working between members of a design team unless the software is so sophisticated that it can generate a figure that shows where the other users are looking.

The CIMI is designed to overcome this problem. Instead of being enclosed in individual headsets, the design team and

client can interact freely during the virtual reality session.

Stevenson says he suggested construction industry involvement in the centre after he heard that Silicon Graphics was installing state-of-the-art processors at the university for scientists working on medical imaging techniques. Funding came from three sources: Engineering Technology invested £200 000, the European Union contributed £800 000 and Silicon Graphics added another £500 000.

The idea, says Stevenson, is to make the technology widely available to the construction industry: "At present, the machines needed to drive real time computer models are too expensive for even the largest project teams to use."

Making design interactive

David Chapman, an architectural assistant with Nottingham-based practice Cox Freeman Partnership, recently arranged a session to view a headquarters office design with a major client. "We used the system because we wanted to get the client as involved in the design process as possible."

He says that the system proved more productive than alternatives. "Traditionally, you use a series of static

drawings and talk through the design. Using virtual reality was more realistic and allowed us to discuss the design in a more interactive way. It was a much more comprehensive process than using drawings. There were no preset routes.

"Our client had previous experience with using practice-based computer modelling and found the Nottingham systems much better, because there weren't delays as each image was generated. This made it easier to direct."

However, Chapman says the one drawback was the length of time needed to convert the standard CAD files into ones the CIMI computer could read. "There was a lot of work to get the data reformatted to suit its needs," he said.

Stevenson hopes the centre will act as a catalyst for the adoption of formats that can be converted easily into virtual reality code. "Once clients have used the facility, they will see the value of having properly structured data and will then push for it among their design teams."

At present, Engineering Technology is acting as an interface between the centre and the construction industry. "We prefer to provide advice and tools to allow design teams to develop properly structured data that can be readily turned into VR models," says Stevenson.

ON THE WIRE

'Revolution' in file transfer

New developments in satellite technology could allow the rapid transmission of very large computer files such as CAD models, virtual reality displays and maps.

At present, transmission technology relying on ISDN or the public telephone network is time-consuming and costly. The new technique, developed by Esys, a supplier of technology to the space industry, and Intergraph, a hardware and software developer, uses domestic satellite dishes connected to a 486 PC to receive digital information from a base station at 2 Mbytes/second.

Developed with funding from the Department of Trade and Industry, the technique could revolutionise the transmission of computer images over long distances.

The Esys/Intergraph system costs about £2.40 for a 10 Mbyte file. The receiving dishes cost £1000 in the UK but this could fall to about £400 as they become more widely used.

At present, the transmitting equipment is too expensive for most firms, so the joint venture will provide a service whereby it receives files by ISDN and sends them on via satellite. Alan Wild, Intergraph's central government account manager, says the transmissions will be secure because of the encryption procedure.

Geography database launched

Construction consultants and contractors will be able to access up-to-date government geographical data on the Internet through a new service launched by Intergraph.

The service, known as Geomedia Services, will allow anyone with a 486 PC linked to the Internet to access a range of geological data, as well as a map-linked directory containing all the UK's Sites of Special Scientific Interest.

Intergraph will manage the project for the government. All the information will be stored as vector rather than raster files so that viewers can zoom in on areas of particular interest.

When a user requests a map through the web site it will be scanned in and converted to vector files. This will take 24 hours compared with a previous delay of three days. If the map has been scanned before, it will be available almost immediately.

Information can be delivered via the Internet for small files or on floppy disk, CD or tape in the case of larger files. For large maps, users who have access to a receiving dish will be able to use Intergraph's and Esys' digital satellite technology.

Information management misery

Nearly three-quarters of Europe's construction managers are unhappy with their information management systems, says a new report.*

Commissioned by information management firm Unisys and carried out by European business researcher ESSEC, it shows that more than 70% of managers believe their systems do not enable them to retrieve and analyse the right data to do their jobs effectively.

Unisys European director David Smith said: "Construction firms operate in a competitive environment. An efficient information system can help a company win; an inefficient one will help it lose."

* The Construction Industry in Europe: A Study of Information Management Systems can be ordered on: prospero@unn.unisys.com.

Stuart Nicholson of the Building Design Partnership won a certificate of special mention in the Illustration category of the Construction Industry Computing Association Computer Graphics Awards for this image of the new campus for the Adam Opel Headquarters, Exhibition and Conference Centre near Frankfurt. Other winners in the ninth year of the annual awards included Philip Palmer of Kyle Stewart Design Partnership, who won the Computer Simulation Award, and Dragana Terzic of Anderson Terzic Partnership, who won the Hayes Davidson Award for Illustration.

Putting the CAD out

Earlier this month, CAD vendors gathered in Birmingham to unveil their latest packages for construction. IT consultant Rob Howard of Construction Communications was there.

ICAT97, formerly the CADCAM exhibition, took place at the National Exhibition Centre, Birmingham, on 4-6 March. The show has traditionally been targeted at manufacturing industries in the surrounding Midlands, but the organisers are trying to widen its appeal. Despite being only a fortnight after the Construct IT exhibition in London, construction representation is growing.

This year, the show's 150 stands were packed into one hall. To make it easier for the 12 000-plus visitors, the organisers created centres for various disciplines. The construction centre was the focus for largely engineering-oriented packages, including structural engineering software firms such as CSC (UK), Elstree Computing, Finite Element Analysis and Research Engineers. Building services software was absent.

Nevertheless, the show is dominated by applications for manufacturing and engineering, and a range of CAD systems was on display. This is the place where major CAD vendors unveil new products, and this year was no exception. The emphasis was on new versions running under Windows 95 and NT, and lower-cost options.

Caddie was available from two related suppliers, and Cadvance Lite is now sold by Calibre for £495. Pro/Reflex could be found with Parametric Technology, the US firm that took it over last year. The version on display was in its original form, showing little sign of the house style of Pro/Engineer and the company's other object-based systems.

The largest group of CAD vendors was to be found around the Autodesk stand. Autodesk has just absorbed Softdesk, a firm that built add-on applications to Autocad, which dominates markets outside the UK. Autodesk is using the Object ARX runtime extension to lay drawings generated on CAD systems over scanned images such as photographs and maps. This facility was evident in a preview of the next generation of Autocad, which showed the Heathrow Express project by the Laing NG Bailey joint venture.

Autodesk's own document management system, WorkCentre, is likely to be enhanced by incorporating one of Autodesk's agents, and has incorporated Documentum into its CADSpace product selected for the Channel Tunnel Rail Link.

This major CAD developer's move into document management reflected another theme of the show. The production of documents for building projects has been the main objective of IT until recently, but users want to address the management of the documents their CAD systems churn out. In response, at least 50 document management products are now available, several of which were on show at ICAT97.

Since being taken over by Tarmac, Cimage has become a UK-owned, if not UK-grown, document management product. Version 3 on UNIX and Windows NT is already in use at Sizewell B, where it can be accessed from 350 terminals and has a 200 gigabyte optical storage system.

Bentley Systems has TeamMate as its document management system, working particularly with Microstation but capable of managing a number of graphic and non-graphic file formats. This is being incorporated into the company's Back Office strategy which uses remote access database servers. The first product released to work with TeamMate is ModelServer Publisher, which writes to any web browser.

It will be followed by versions of TeamMate and Continuum that are able to exchange databases rather than simply documents. All their transactions, like the .dwf format from Autodesk, can take place over the Internet using TCP/IP protocols.

A seminar featuring Microstation's document management package (left), and Bentley Systems' latest CAD software was on display (right).

Documentum, a system used by John Brown Engineering to control its process industry drawings. This is a US system and looked rather complex on screen. No doubt Autodesk will give it the more friendly appearance it needs. DataCAD

NEW PRODUCTS

Risk analyser for planners
The launch of Predict Risk Analyser, developed by Risk Decisions and distributed by Micro Planning International, is aimed at the planners of projects based on uncertain variables with risks that could affect timing. The spreadsheet-based Predict, used in conjunction with Windows versions of MPI's Micro Planner Manager and X-Pert project management systems, can model both financial and non-financial problems, including factors such as time/duration, reliability, processes and workforce performance.
Micro Planning International
Enquiries: 9015

Decision support software
Unisys has developed Prospero, an integrated decision-support software suite with the capacity to deal with multiple subcontractors, suppliers and complex project requirements. Prospero, an open systems product that runs on UNIX or Windows NT, incorporates a special "monitor" feature. This allows Prospero to alert managers to potential problems, such as the approach of a critical level of spend.
Unisys
Enquiries: 9016

Fire safety database
International Fire Consultants has developed a Fire Management database for fire safety managers. The database, compatible with Microsoft Access, can provide users with information across connected networks, so that details of passive and active fire-protection measures, control of contract works and fire certification can be accessed simultaneously.
International Fire Consultants
Enquiries: 9017

Cut-down CDM Toolkit
The CDM Toolkit Lite, designed for the single user developing health and safety plans, has been launched by Ai Solutions. This slimmed-down version, developed from Ai's flagship product, the CDM Toolkit, which is aimed at network applications and large organisations managing a number of projects. The Lite version allows the user to produce project notification to be sent to the Health and Safety Executive, project site notices, a health and safety plan, a health and safety file and appendices. It costs £249.
Ai Solutions
Enquiries: 9018

Survey software upgrade
Software supplier Softdesk has released an upgrade to its surveying and mapping software, Civil/Survey 7.6. It can support more than 60 surveying instruments, including data collectors, total stations and laser level, from manufacturers such as Sokkia, Nikon, Topcon and Zeiss.
Softdesk Inc
Enquiries: 9019

For further information, fill in the first-class reader enquiry service following page 54.

Intranet surfing

Chris Partridge explains how technologies developed for the Internet are providing new functionality on local networks.
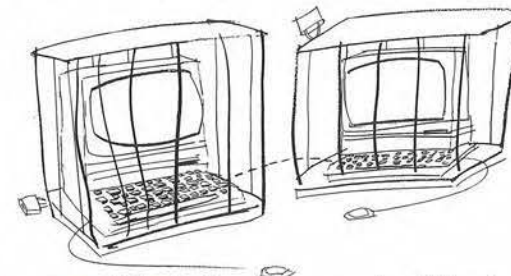
People keep on talking about Internets and intranets. What is the difference?
The Internet is a public network; an intranet is a private network using the same browser technology. I wish the clever dick who coined the word "intranet" could be strung up – it is so similar to Internet everyone has to shout "intRAnet" to make sure the meaning gets across.

What is the advantage of an intranet over the networks we already have?
Existing corporate networks lack the flexibility of browsers, which allow users to roam the network looking for the information they need. The Internet has search engines, but it is not secure.

An intranet combines the best of both worlds, giving a network that can be searched for data but, in theory, cannot be infiltrated by hackers.

So, using an intranet, a dealer could download company brochures from the company database, and upload ordering information without fear of competitors' eavesdropping.

As the software that manages intranets is highly flexible, they are said to be much better at publishing information in a wide variety of formats, including graphics, images, audio and even video. They are also an ideal base for decision support systems that gather information from all parts of the system and aggregate them for management reports.

What do you need to install an intranet?
Setting up an intranet can be as simple as installing software on an existing local area network or as complex as building an international network of fibre-optic and satellite links. An intranet can run entirely on company-owned wires, or space can be leased on public networks.

Who are the leading suppliers?
All the network companies are moving into intranets. Novell, for example, has just teamed up with Internet service provider UUNet to link its intranet technology, IntranetWare, to the Internet by a technology called PipeWare.

PipeWare products are being designed to encourage the huge installed base of Novell NetWare users to migrate to intranets. Consulting companies are also emerging, such as Intranet Partners (IP – www.ip.com), launched in March, which specialises in helping companies to develop their intranet strategy.

Hewlett Packard has just announced a lineup of intranet products, and Netscape is now focusing almost exclusively on intranet systems.

Surely this means all of our old databases need to be replaced?
Not necessarily. Several software products are coming on the market to make traditional databases accessible to browsers, such as Amazon from Intelligent Environments and Web DataBlade from Hewlett Packard. These systems aim to allow intranet users access to data on ageing mainframes.

It all sounds lovely. Are there any drawbacks?
Adopting intranets is likely to cause shifts in the way firms operate. Close associates, such as key suppliers and customers, will become much closer.

But the biggest shake-up is likely to be internal. Access by everyone to information everywhere will affect the way a company is managed, and anyone installing an intranet should consider the consequences. What happens when the data collection powers of the intranet remove the need for a layer of middle management whose role is to compile production and operation reports? And is it desirable for all staff to have access to the firm's financial records? Having said that, most analysts believe that everyone will be on an intranet soon.

Next month: new modem technology.