AEROBEL

Winter 1998/1999 Volume 2 Issue 2

Innovative Applications with DWB™ at London Underground

Investigating access options for mobility impaired persons - Whitechapel Station

Readers may remember an article in Volume 1, Issue 1 about CrossRail using Designer's Workbench™ from Centric Software (then Coryphaeus) to help design safer stations.

In 1996 the CrossRail project within London Underground Limited (LUL) introduced a VR 'service' as part of the CAD team at LUL's Engineering Information Services (EIS) group.

The EIS CAD team provides business support services to the whole of LUL, including other parts of the Engineering Directorate at London's Canary Wharf. VR has been used in simulations of emergency scenarios at stations but also contributes to risk and value management analysis in major construction projects. This is in line with the current philosophy of integrating all LUL disciplines and directorates as well as the civil engineering contractor at an early stage in the construction project.

Centric's tools enable a visualisation capability in 3D that highlights potential problems *before* construction work begins from 2D plans and drawings.

In fact the EIS CAD team has used VR to introduce the concept of **modular station design** to assist the planning process and illustrate different options in the architectural scheme as well as show the impact of different construction technology such as new tunnelling methods.

The promotion of VR as a serious analysis tool has led to some innovative applications of the 3D tools to solve difficult engineering problems.

LUL is responsible for over 280 station buildings and other railway infrastructure, many of which are well over a hundred years old. There is one example in South Kensington where there are two 'covered ways' consisting of 88 Victorian brick arches, that also support some property above. Over time, the structures have weakened to varying degrees and now require re-inforcement with pre-fabricated steel beams that take account of the limited space available between the existing arches and trains below. The original plan was to manufacture beams of a selection of profiles to accomodate the different movement of the arches, then test each for fit during 'engineering hours', typically 1am to 4am, thus restricting the number that could be completed per night.

The lateral solution was to conduct a highly accurate survey of both covered ways so that a precise 3D model could be built. On his desktop, Sonny Tan of EIS is able to use multiple-point collision detection in EasyScene™ to scan clearance between the steel beam, the rail track and the brick arch. Accuracy is paramount, since a minimum gap between the arch and beam must be maintained to be filled with grout for uniform pressure distribution. Sonny needed to write a short 'C' routine to cycle through the 64 clearance points on each arch, since Performer limits the simultaneous number of collision tests allowed to 32.

The results show that all 88 arches can be strengthened using beams of just two profiles *and* also provide the critical position of each to the nearest millimetre when installed, without the need for a lengthy trial-and-error approach that may impede train services on a busy railway.

The next major application of DWB™ will be a 'Platform Train Interface Study' to provide easy access for mobility impaired persons to trains on curved platforms. This study, which takes into account factors such as train loading/dynamics and different rolling stock, will allow LUL to determine the best way to modify platforms or train design for safe wheelchair access.

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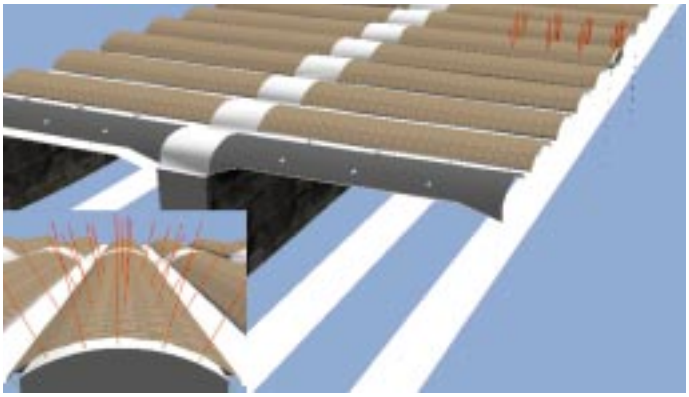

Arches showing collision detection points

Stealth Demo at ISES '98

As well as being a 'live' participant in the SE demo at the International Synthetic Environment Symposium held at RMCS last October, Aerobel provided the Stealth Viewing facility. This comprised an interactive out-of-the-window (OTW) view and correlated 2D map, both projected on large displays.

Aerobel's **military symbology** overlaid on entities in the OTW view went down particularly well with users and staff from both DERA and US R&D Labs. The military symbols appear as the viewing distance increases so the entity type can still be identified when it is no longer recognisable from its silhouette.

This was one of several features that Aerobel had incorporated to improve the viewers' orientation and ability to appreciate the different aspects of the 'live' battle as it evolved.

The benefits of these features were greatly appreciated by the attendees of the Symposium and enabled some very smooth interaction between the presenter and stealth operator.

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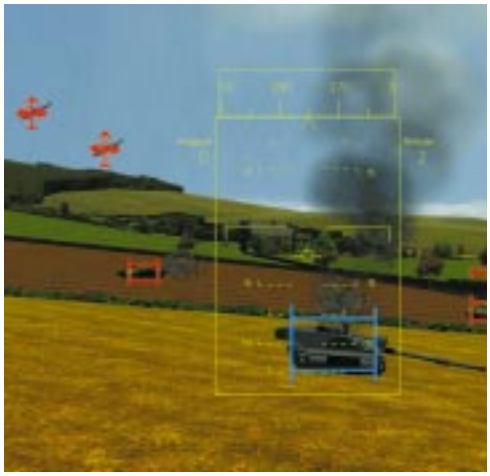

Typical OTW scene showing symbology

DWB™ Modelling Hints & Tips

Pressing the <ctrl> key and the middle mouse button will snap one object to the face of another object.
NB Ensure 'Snap to Grid' is disabled

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I/ITSEC '98

I/ITSEC '98 - held in Orlando in December - finished a busy year for the company. The latest version of the generic helicopter simulator was demonstrated using Aerobel's high-fidelity 3-channel realtime visual system running at 60Hz together with a 6 degrees-of-freedom electrical motion system and cabin produced by Motionbase.

Honeywell chooses DWB™ over VAPS

Here's yet another success story for Centric Software Inc.:

Honeywell provides cockpit avionics systems for commercial and military clients such as Boeing, Lockheed Martin, United Airlines, Delta Airlines and American Airlines. They conducted an extensive evaluation of Designer's Workbench™ against their existing installation of VAPS and chose DWB™ with the OpenGL Source Code Generator option at both their Arizona and New Mexico locations. The principal reasons for their decision to choose DWB™ were:

- It is more modern, efficient code
- It runs faster on the same machine
- It is a smaller application - its installation footprint and memory requirements are smaller
- It has an open library structure
- It offers comparable features with a more intuitive GUI

Readers interested in seeing an informative video of Boeing using DWB™ and the OpenGL Source Code Generator for prototyping the Pilot Vehicle Interface on the F-22 program should contact sales at Aerobel.

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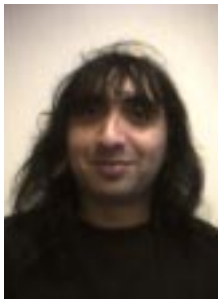

More New Staff

Growth continues at Aerobel - Tajinder Sagoo has recently joined us to accelerate the company's development of PC based realtime visuals, bringing considerable expertise with him including:

- 'Technosphere' (an artificial life simulation in Bradford Museum) ported from SGI to Windows NT
- 'Back to Baghdad' (a flight simulator to run on DOS/Windows 95/NT)
- 'Dragon' (a game with Bruce Lee for 3DO)

His role will be to lead the company's migration of existing products to run on PCs. This will leverage Aerobel's proven capability in the generation of highly detailed geospecific terrain databases by enabling us to provide customers with realtime visual solutions ranging from *high fidelity* systems based on SGI computers, to *low cost* systems based on PCs.

Further Information

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Forthcoming Events:

- **ITEC '99**
  The Hague, The Netherlands
  13th-15th April 1999