

- DaimlerChrysler
- Italian Job
- Show Diary
- Scanning Tips
- State-of-the-Art facility
- ModelMaker X System

3D scanning helps Evernham Motorsports design faster cars.



When developing a new Dodge Intrepid for the NASCAR circuit, Evernham Motorsports used a 3D Scanners ModelMaker to obtain a comprehensive digital description of the car body, ensuring that even the most minor changes made to improve aerodynamics could be consistently reproduced in the actual race cars.

"The ultimate benefit in using the laser scanner is faster times on the track," says Tim Malinovsky, an engineer at Evernham Motorsports. "By allowing us to capture millions of x, y, z coordinates very quickly, it lets us document a winning shape so we can recreate it in every car we build."

The car Evernham designed acts as a model for many other vehicles. It will be used by 10 different NASCAR teams, with each team building between 9 and 15 copies of the vehicle over the course of several racing seasons. "Even though bodies are built according to templates, each one is slightly different," says Malinovsky. "The differences might be very minor yet still have a big impact on the track. We wanted to be sure that when we had a body that performed well in the wind tunnel, we could document it exactly and reproduce consistently."

Once the team have the co-ordinate data from a model, it can be used in a number of ways: for the production of a scale model for aerodynamic testing, as a precise record for tracking aerodynamic improvements, as a complement to the templates used to build the cars and as a way of validating the Dodge Intrepid bodies built by the race teams.

For Evernham Motorsports and all the teams that will race the new Dodge Intrepid, laser scanning has become an important addition to the engineers' toolkit.

"With the scanner, we ensure that once we have a winning shape, we can reproduce it as often as necessary throughout the racing season," says Malinovsky.

technical support for revolutionary new bra

>> more on page 4



3D SCANNERS goes X rated

3D Scanners has launched the ModelMaker X system, an enhanced version of the acclaimed ModelMaker W series, designed specifically for applications where greater detail and a smaller, lighter scanning unit are required.



The new ModelMaker X system builds on the success of the current ModelMaker W range, the world's first hand-held scanning system, which allows objects of almost any size, shape and material to be scanned. "The ModelMaker W range has had a remarkable impact on measurement across a wide range of industries, particularly in automotive design and inspection" says Chris Dryden, a product manager at 3D Scanners. "The introduction of the X range extends the capabilities of ModelMaker even further into a wider range of applications."

Both ModelMaker systems are portable, flexible systems which provide users with a fast, easy means of creating highly accurate digital representations of objects with complex geometries, whether for direct inspection against CAD data, styling, reverse engineering, computational fluid dynamics, milling or visualisation.

While ModelMaker W continues to be a cost effective solution for the vast majority of applications

ModelMaker X, designed specifically for high detail applications or for objects with restricted access, retains all the key features and benefits of the ModelMaker W range but is around 60% smaller and 40% lighter.

In addition to the significant size and weight reductions ModelMaker X features increased scanning speeds and point resolution, new robust cable design, slimline sensor mounting arrangement and voice activated menu control. The new optical arrangement provides enhanced noise rejection characteristics in addition to higher data capture and spatial resolution.

As with the W range, sensors are available with three different laser stripe widths so that data capture rates can be maximised depending on the size of object being scanned and point density required. Point spacing, or spatial resolution, as low as 0.025mm can be achieved, while both W and X systems retain the potential to cope with scanning a greater range of surface finishes and colours than competing products.

Show Diary

29 Apr - 3 May 2002
MACH, Birmingham, UK
3D Scanners (UK)

6-11 May 2002
Mecancias, Sao Paulo,
Brazil
Seacam

21-23 May 2002
EASTEC 2002, MA, USA
NVision, Inc.

22-23 May 2002
Man Tech, Edinburgh,
Scotland
3D Scanners (UK)

28-31 May 2002
Austech, Sydney, Australia
Scanning and Inspection

18-21 June 2002
CAT, Stuttgart, Germany
DESCAM

12-13 June 2002
Quality Expo Detroit, MI,
USA
NVision, Inc.

25-29 June 2002
Brasilmaq, Rio Grande du
sol, Brazil
Seacam

1-3 Oct 2002
Austrotec, Wels, Austria
DESCAM

9-10 Oct 2002
Welsh Man Cardiff, Wales
3D Scanners (UK)

3-8 Oct 2002
BIMU, Milan, Italy
3D Scanners Italia

16-17 Oct 2002
TCT, Manchester, UK
3D Scanners (UK)

23-24 Oct 2002
Northern Man, Newcastle,
UK
3D Scanners (UK)

12-14 Nov 2002
TEAM, Birmingham
3D Scanners (UK)

19-20 Nov 2002
North West Man,
Manchester, UK
3D Scanners (UK)

ModelMaker gives competitive advantage to DaimlerChrysler



The purchase of a 3D Scanners ModelMaker system by the Detroit based DaimlerChrysler Vehicle Measurement Lab (VML) has significantly reduced both the time taken to measure parts and also to turn the point clouds into CAD models.

The Laboratory's main role is to provide thorough, quantitative descriptions of competitors' vehicles, including width, height, wheelbase as well as the layout of the interior space, so designers can see how other manufacturers addressed certain market needs.

Donald Misson, Vehicle Measurement Lab supervisor, explained, "We get some design data from the organisations we belong to, but we've found that the most accurate way to evaluate competitors' vehicles is to measure them ourselves."

The company's Vehicle Measurement Lab scans car bodies, interiors, and clay prototypes to support the design process. The resulting 3D point cloud is imported into a CAD system and converted into surfaces.

Previously the laboratory had used a co-ordinate measuring machine and a mechanical digitiser. This system captured relatively few co-ordinate locations, was time consuming and produced inaccurate data on soft surfaces, making the construction of surfaces very labour-intensive. Often the level of data collected was less than the designers required, "Even if you scan every 50 millimetres, you can miss some detail of the surface," says Misson.

These limitations led Misson and his colleagues to evaluate non-contact devices for data capture. After evaluating the products on the market, they decided that the system that best suited their needs was a 3D Scanners ModelMaker laser scanner. The ModelMaker software was one of the main reasons the lab chose this system, according to Misson. "We were very impressed with how the software simplified the act of scanning, by removing duplicate data for example, and by how it can reduce the data size to a user-selected density," he says.

Switching to a laser scanner means that millions of co-ordinates can now be captured very quickly and without touching the object; it is possible to scan clay models without marking them, and to scan soft objects such as leather seats more accurately. "The advantage of the laser scanner is that it gives us a greater density of data," says Misson, "Rather than cross sections of an object we can provide complete surfaces, so there's much less time required to generate surface models in the CAD system."

3D Scanners UK supports **State-of-the-Art** facility for tomorrow's engineers

3D Scanners (UK) has won a major contract to supply equipment to a new State-of-the-Art facility that will help the UK's design engineers of the future to hone their skills.

3D Scanners (UK) is to supply the very latest computers and 3D scanning equipment to Coventry University's three-dimensional digital laboratory, where students in engineering and vehicle design will learn how to harness the power of technology to produce 'virtual' vehicles.

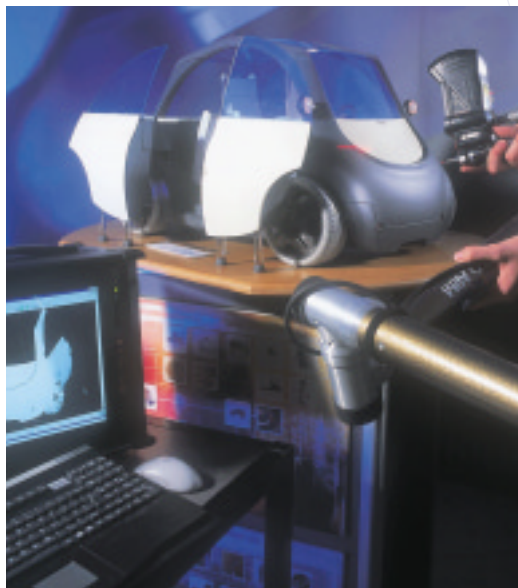
The contract and sponsorship deal, together worth in excess of £300,000, forms part of a £1.5m project providing state-of-the-art facilities including a computer aided styling studio and digital production theatre to the School of Art and Design and its world-renowned automotive design course.

The advanced digitisation and modelling workshop, known as the CU-ADAM laboratory, will play a major role in extending the scope of the University's work in design and modelling research.

As part of the deal, 3D Scanners (UK) also sponsored Coventry University's 'Fast Forward' event, at which the new facility was officially launched.

Jim Clark of 3D Scanners (UK) commented, "We are delighted to be awarded the contract to supply this equipment to the University, which is clearly showing its commitment to developing the automotive designers of the future through this major investment in a dedicated centre".

Prof Clive Richards, the University's Associate Dean of Art and Design, who is leading the project, said:



"Modelling in the broadest sense, whether digital or physical, is at the core of the design process".

"This new laboratory will provide a magnificent facility, enabling us to explore new strands of investigation into the use of digital technology for creative design purposes, as well as enhancing student experience at Coventry."

Successful

Italian job for 3D Scanners

3D Scanners reports bumper sales of scanning equipment to Italian customers – even before its new Italian office is officially open!

In the build-up to the establishment of the new Turin base – scheduled to open in May - 3D Scanners has already attracted substantial orders from major automotive tier one suppliers, including SAT, Cecom, Elba and Stola, for the acclaimed ModelMaker system.

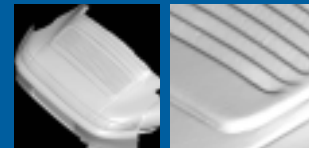
The success in Italy is mirrored by strong growth in other markets in particular the UK, where four new staff have been taken on to meet the demand for both sub-contract bureau work in inspection and surfacing,

and after-sales service as a result of increased sales of ModelMaker.

"Our new Italian office will provide a convenient, comprehensive bureau service as well as fast, responsive after-sales support, to our new and growing Italian customer base, as it will be based in Turin at the traditional heart of the country's automotive industry," says Giles Gaskell Italian country manager.

Scanning tips

n°2



Good scanning technique not only makes for more efficient scanning but also for cleaner data and quicker post processing.

During the data capture process, thousands of points are measured each second. To ensure the best quality scan results, a good scanning technique is needed.

Scanning using a ModelMaker system is often compared to spray painting - only the object appears on the computer screen rather than paint coating the object. Just as applying too much paint will clog the surface of the object, a poor scanning strategy will produce redundant data which will fill the memory of the computer affecting system performance and post processing times. Likewise just as applying too little paint will produce a patchy finish, capturing data in a random manner could result in poor or no data being collected in a vital area.

The most efficient scan method is to move the sensor over the object in a sweeping motion capturing data in one direction, and then starting over making parallel scan patches with as little overlap as possible. Avoiding excessive overlapping means that more surface area is covered in less time and with less redundancy of points, post processing times will be kept to a minimum.

Tools such as 'Limit distance between stripes' and 'Disable reverse scanning' have been added into ModelMaker software to help ensure correct spacing between stripes so that unnecessary data capture is avoided.



technical support for revolutionary new bra

3D Scanners (UK) Ltd
The TechnoCentre
Coventry University
Technology Park
Puma Way
Coventry
CV1 2TT
UK

Tel: +44 (0) 24 7623 6575

Fax: +44 (0) 24 7623 6576

E-mail: info@3dscanners.co.uk

Web: www.3dscanners.co.uk

3D Scanners Ltd
Southbank Technopark
90 London Road
London
SE1 6LN
UK

Tel: +44 (0) 20 7922 8822

Fax: +44 (0) 20 7922 8899

E-mail: info@3dscanners.com

Web: www.3dscanners.com

Details of your local distributor
can be found on-line at
www.3dscanners.com

The most radical newcomer in underwear design for decades owes much of its comfort and support to the power and flexibility of the ModelMaker laser scanner.

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Leading design consultancy Seymour Powell was commissioned by Nottingham based Charnos to come up with an alternative to the traditional underwired bra. The Bioform solution is based around moulded plastic components not normally associated with lingerie design. Advantages include much improved comfort and support and no more danger of wires detaching themselves and ruining washing machines.

In order for this ingenious bra to have any future, it was vital that its shape was perfectly matched to a typical female bust, so a representative sample of similarly sized women was gathered together at Charnos HQ.

Each bust was scanned in by Nik Alimaras from 3D Scanners (UK). "Although ModelMaker is more typically used for scanning new car designs, it actually couldn't have been more appropriate for this job," he explains.

"For a start it is fast. Secondly it is extremely accurate – there would be no point building an average sized

bust if the numbers were wrong in the first place. It's a non-contact scanning solution, which was obviously a pre-requisite. And it is flexible enough to be transported to Nottingham and used in a standard office environment, while other potential solutions may have required special lighting conditions."

From the data that 3D Scanners (UK) was able to provide, Seymour Powell could confidently design a moulded but flexible plastic shape the contours of which would accurately match a bust of average shape given the chosen size. This was used as the basis for a prototype bra and eventually the Bioform was born.

