



Playing with Reality

How Triple Eight's digital prototypes are translated into top race game

“Developing a car exterior using digital prototypes takes around eight days compared to around 12 to 13 – so it saves around 25 per cent of the work time. Modelling the interior saves around 10 per cent.”

Carl Faux

Design and data manager at Triple Eight

For many, the thought of driving a racing car around a circuit is a dream come true. In reality though, only the most dedicated, skilled and expert drivers get the opportunity.

However, in virtual reality, it's a different matter. For example, with games such as Race 07 developed by the Swedish firm SimBin, anyone can experience the thrill of competing in the World Touring Car Championships (WTCC) and hurtle round some of the world's legendary tracks such as Monza, Zandvoort or Brands Hatch.

Not only are the circuits exact replicas of the real thing, but the cars are too. And not just visually; the developers go to great lengths to translate the performance differentials of the real cars to their own.

But how is this done? How are the developers able to be so precise and accurate in their creations?

Mostly it involves painstaking attention to detail – with developers taking their data from a mix of sources including photographs and the automotive manufacturers themselves. However, when SimBin came to work with the UK engineering firm, Triple Eight Race Engineering to create an extension of Race 07 featuring the British Touring Car Championships, it was able to replicate the winning Vauxhall Vectra, quicker and easier than usual.

This was due to a couple of factors – but mainly because Triple Eight was able to supply complete and accurate digital prototypes of the car. These had been created using Autodesk Inventor, so the data could be easily used in Simbin's Autodesk® 3ds Max® and Maya® software.

Triple success

Of course Autodesk software is used extensively in the computer gaming industry. Yet, very rarely does its top-selling manufacturing design software, Autodesk Inventor venture quite so far into this territory.

On the engineering side, Triple Eight has been an enthusiastic user of Autodesk Inventor for well over five years now. The firm was founded twelve years ago to design, build and race the Super Touring Vectra on behalf of Vauxhall Motors.

Since then their success has been remarkable. Vauxhall's British Touring Car Team, VX Racing has become the most successful team in the modern British Touring Car Championship era with a total tally of 18 championship titles. Earlier this year, they once again won the “triple” – all three championship titles, in their Inventor-designed, race-modified Vauxhall Vectras driven by Fabrizio Giovanardi, Matt Neal and Tom Onslow Cole.

The design team says that digital prototypes created by Autodesk Inventor enable them to visualise, simulate and analyse their ideas before they are made real. “This enables us to work creatively – but faster than if we were using a traditional solution. Plus, it gives us the flexibility to model conceptually and trial different scenarios early in the development process,” says Kevin Berry, Triple Eight's technical director.

Carl Faux design and data manager at Triple Eight explains further: “We're constantly refining our designs. Creating digital prototypes means that instead of just trying out two or three designs, we can test 20 or 30 iterations in order to get to the right one.”



When SimBin contacted Triple Eight to ask if it would like to participate in the extension to Race 07, the answer was obviously 'yes'. Jay Ekkel of the SimBin development team takes up the story: "Normally we go out to the race track and take photographs of the cars and combine these with data from the manufacturer. However, in this case we only had access to the CAD files.

"However, the fact that these were complete digital prototypes of the cars meant our work was based totally on the car specifications which were accurate and reliable. Consequently, we got to the finished product in a much shorter timescale. For example, developing a car exterior using digital prototypes takes around eight days compared to around 12 to 13 – so it saves around 25 per cent of the work time. Modelling the interior saves around 10 per cent."

Another big bonus was that SimBin also uses Autodesk software – namely 3ds Max® and Autodesk® Maya®. As a result, Triple Eight could supply the data in a compatible format.

Ekkel explains how developers begin with a "black box" as a base – the same for every car. They then create a shell over the top using the 3D data.

"Although we re-create the cars as accurately as possible – we do have to trim down the CAD file, from millions of polygons to around 25,000 otherwise we have just too much detail," he explains. "The model contains information of just about everything – wheels, bodywork, cockpit up until the wheel nuts, everything is there."

"We also use the model to see how the car performs; it contains information about the ratio of the gearbox, the parameters of the engine, suspension points etc. This all gets put into the gaming model too so that the car drives just as it would in real life."

For even more authenticity, SimBin then asks the real-life drivers to fill in a questionnaire about the handling of the car, so that they can reproduce this in the game too.

At this stage, SimBin uses the visualisation software – in general, 3ds Max® for games for PCs and Maya® for those designed for the Xbox. At this stage, attention to detail is just as acute, with great care taken on the position of sponsors' logos and other features which all help the car appear authentic.

However, there is one drawback to all this extreme accuracy – and you may wonder why the racing teams involved are happy to release their intellectual property so that other designers can copy their ideas and solutions.

SimBin is very sensitive to this fact and has come up with an answer. It has found a way to mask and recalculate certain confidential numbers. "This ensures we keep the essence of the car, without ever revealing the true figures," says Ekkel.

Showcasing ideas

Back at Triple Eight, Faux explains that this once digital prototypes have been created, the data can be used in many ways. The team has invested in Autodesk Showcase, a specialised visualisation solution to create high-end images for marketing purposes – for example, to help demonstrate certain points about the cars to sponsors before the cars are actually modified.

It is currently using the latest version of Autodesk Inventor to develop its 2009 cars and Showcase is proving invaluable in communicating its new ideas. "We've recently visualised one Vectra in a showroom setting with one of the panels removed so that you can see what's underneath the skin of the car and begin to understand how it works. Or it can simply be a way to show a sponsor what their logo will look like on the car," he says.

He says that the firm is also looking at specialist software to test the aerodynamics of the cars using the Autodesk Inventor digital prototype.

"We're increasingly finding ways to use the digital model once it has been created," says Faux. "And, because we can use the data with confidence and without having to re-create information, it gets us to where we want to go far faster."

Meantime SimBin has just released its latest game using Autodesk® Maya® – RacePro, a Xbox 360 exclusive game.

For more information

To learn more visit us on the web at www.autodesk.co.uk/inventor