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Better buildings envisioned using Autodesk 3ds Max.

By Audrey Doyle



Images courtesy of Spine 3D

Spine3D extols the benefits of using Autodesk 3ds Max software for creating photorealistic architectural animations and next-gen games.

Whether they appear in a virtual tour of a proposed multimillion-dollar condominium complex or in a next-generation video game, buildings and other architectural structures must look photorealistic.

The folks at Spine3D know this firsthand, as they have experience building architectural environments for both application areas. To ensure photorealism in all the buildings they create, they rely on Autodesk® 3ds Max® software as their primary 3D modeling and animation tool.

Application Area Agnostic

Formed in 2000, Spine3D is a high-end 3D animation and visual effects studio based in Miami. Besides sharing a passion for animation, Spine3D's founding partners hold advanced degrees in architecture, and are highly trained and accomplished 3D artists as well.

Since its inception, Spine3D has focused on creating detailed, photorealistic architectural walk-throughs and fly-throughs of proposed real estate projects for an impressive roster of clients that includes Donald Trump, Arquitectonica, and The Related Group, among others. For all of this work, Spine3D has always relied on 3ds Max software.

"We began using 3ds Max because most of the architectural companies we work with rely on AutoCAD software to generate their construction documentation, so the bulk of the information we receive comes in the form of AutoCAD DWG files, and 3ds Max is seamlessly compatible with DWG files," says Kevin M. Smith, Spine3D principal and co-founder. "In addition, all of us have backgrounds in architecture, and we are proficient in AutoCAD, so we wanted a 3D modeling and animation package that was compatible with AutoCAD. 3ds Max is that package."

It wasn't long before Spine3D realized the numerous other benefits 3ds Max software offers. In terms of modeling, for instance, Smith says the software's spline tool is one of its best features. "It lets you draw any shape, and extrude, bevel, and chamfer it quickly and simply," he says. He adds that the software "has the best and easiest Boolean tools on the market."

Regarding materials and mapping, Smith says the team enjoys the level of detail and control the software provides for creating and editing materials. "We mostly use standard materials, occasionally using third-party materials, depending on the rendering engine we're using."

When it comes to lighting and camera mapping capabilities, Smith says the software is stable and easy to use, and offers great control and flexibility. "Lighting is extremely important to our designs and animations," he says. "Maneuvering lights in 3ds Max is a smooth process and the Light Lister tool provides excellent control, especially over scenes with a lot of lights."

Meanwhile, Spine3D project coordinator/artist John Bouma commends the benefits of the software's two-point-perspective camera correction modifier. "When we set up camera angles, the image can get distorted depending on the type of lens that is used and its distance from objects. Being able to fix that, especially for architectural renderings, has been extremely helpful."

Finally, in terms of rendering, Smith says the team relies primarily on the 3ds Max scanline rendering engine and occasionally on third-party plug-ins, noting that their speed and quality make them valuable and effective tools. He adds that the team has used the free* Autodesk® Backburner™ network render management software, and plans to use it more frequently as they look into expanding their render farm.

Architectural Animations Abound

According to Eddie Leon, Spine3D president, 60 percent of the company's work comprises rendering jobs and 40 percent comprises animation. "We've been doing more animation lately," he says. "There's a lot of condo development going on in Miami. Our 3D animations help our clients to sell their buildings. We've become recognized as the experts in architectural virtual tours."

"Our animations are not your typical walk-throughs/fly-throughs," adds Smith. "Our creative director, Robert Rios, designs them to be a lot more cinematic, like movie trailers. 3ds Max helps us to stand apart from our competitors in this regard."

A recent real estate development project bears this out. For the project, client Royal Palm Communities and architect of record Arquitectonica hired Spine3D to create a 4-minute virtual tour of a proposed condo development called Paramount Bay, in downtown Miami.

According to Smith, the team began with construction documentation that the client and architect provided as AutoCAD® DWG files. Then they used 3ds Max software to build, texture, and light the 3D models comprising the development, relying on such tools as the spline modeling tool and subobject modeling, as well as on the software's standard materials for material mapping. "Then we incorporated the models into live



Spine3D

aerial video footage, because the condos are located off Biscayne Bay, and the client wanted to show their proximity to the water and to downtown Miami," Smith says.

Once they had camera angle confirmation and approval on the storyboard and on the model's accuracy, colors, and textures, they rendered the final animation and images. "For models and shots containing lots of geometry, we used the standard scanline renderer because it's faster when working with lots of polygons. And for some of the renderings and still shots we used third-party plug-ins," says Rios. As the final step, the team added sound and motion graphics, and then used the Autodesk® Cleaner® XL industry-proven media mastering and encoding solution to compress the files for delivery to the client. "Cleaner is the best solution for compressing files and maintaining low file sizes, without compromising image quality," notes Rios.

According to Rios, the biggest challenge with this project concerned dealing with design changes and revisions made by the client and architect. "There was a lot of back-and-forth between us and the client and architect because of design changes during the project. The great thing about 3ds Max, though, was that we could edit the model easily and quickly."

"Project designs change, yet deadlines always remain the same," adds Smith. "The ease of modeling in 3ds Max, and the speed that the scanline renderer provides, helped us to stick to our deadline."

Architecture in Gaming

As noted earlier, although Spine3D has enjoyed several years of success in architectural animation, recently the company had the chance to use 3ds Max software in a different application area: gaming. For this project, leading game developer Electronic Arts solicited Spine3D to create a 3D model of a small European farmhouse. "They're working on a next-generation game, and the goal of this '3D asset test' was to provide them with a high-quality 3D architectural asset that they could drop into their gaming engine," explains Bouma.

"The Xbox 360 and PS3 next-generation game consoles are going to require 3D models that are a lot more sophisticated than current consoles require," says Leon. "Most of the people in the game industry don't have traditional architectural training, but [they realize that for] the Xbox 360 and PS3 they need a high degree of precision and quality in their architectural backgrounds and environments."

"Electronic Arts is looking to companies like ours to gain more expertise when it comes to creating architectural environments," Leon continues. "That's why they experimented with us on outsourcing their environments."

Spine3D built the farmhouse model from scratch in 3ds Max software, using concept sketches and photos of existing farmhouses as reference. Because EA wanted the farmhouse to look weathered, Bouma says the team spent a lot of time focusing on texture mapping. "Utilizing the Render-to-Texture feature in 3ds Max made this task reliable and efficient," he says.

Another feature that came in handy was the software's normal maps. Because the model was for a game, the team needed to build it using low-polygon-modeling techniques. "With the normal maps in 3ds Max, you get the appearance of more detail through mapping rather than through modeling," enthuses Bouma. An added bonus for this project was 3ds Max software's full compatibility with the Unreal Engine game development framework. "Autodesk provides export tools in 3ds Max for bringing your models directly into the Unreal Editor," Bouma says. "It's very clean."

At the time of this writing, EA was in the process of reviewing the model. Regardless of whether EA works with Spine3D on the forthcoming game, Smith says that Spine3D is expanding its focus to include the development of 3D architectural environments for games. For this application, the company will continue to rely on 3ds Max software.

"As we enter the game industry, 3ds Max will be our platform of choice," Smith says. "We've found it to be a reliable, effective, and integral tool, regardless of application."



Images courtesy of Spine 3D

Our animations are not your typical walk-throughs/fly-throughs. Our creative director, Robert Rios, designs them to be a lot more cinematic, like movie trailers. 3ds Max helps us to stand apart from our competitors in this regard.

Kevin M. Smith, principal and co-founder
Spine3D

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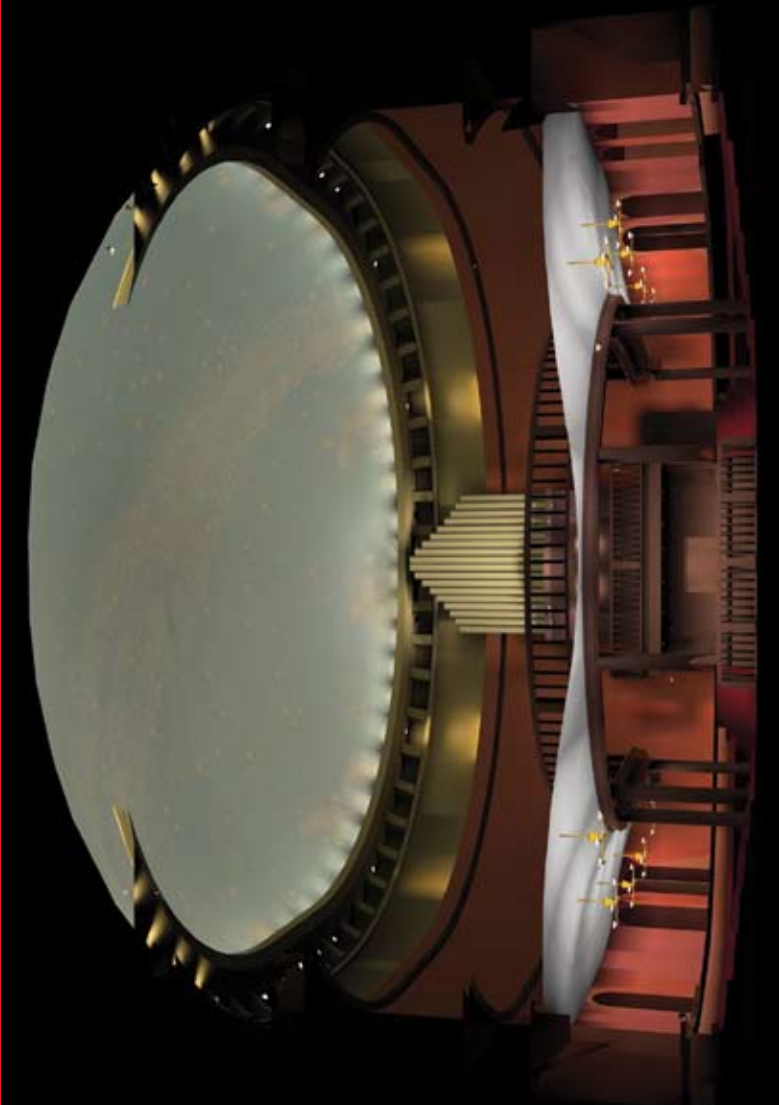
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Visualize
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Illuminating Imagery

By Audrey Doyle

Images courtesy of Palindrome Lighting Design, Inc.



With Autodesk VIZ software, Palindrome creates lighting designs that are photorealistic as well as accurate.



A certified lighting designer, Michael Noon has structured his company, Palindrome Lighting Design of Gambrills, Maryland, around helping his clients explore the art, the science, and the business of great lighting.

"When I talk about the art of lighting, I'm talking about how lighting can make an average space look stunning when it's used correctly, and how it can ruin a great-looking space when it's used incorrectly," Noon explains. "When I talk about the science of lighting, I'm talking about accurately predicting how invisible electromagnetic energy will interact with surfaces and colors and how that interaction will affect people, one of the most difficult things to achieve in design. And when I talk about the business of lighting, I mean the importance of the role that lighting plays in all construction projects, as well as the importance of having a photorealistic lighting design that you can show to clients and whose accuracy you can defend in order to see the design through to completion."

Being able to combine the art, the science, and the business of great lighting is crucial if one is to succeed in the lighting design field, Noon says. That is why his company relies on Autodesk® VIZ software, and its combination of powerful 3D modeling, rendering, and photometric lighting capabilities, for all of its projects. "VIZ has the tools that enable us to portray lighting ideas for our clients' projects quickly and accurately," he says. "When we need photorealistic images that also are accurate, VIZ is the tool we turn to."

Noon says that Palindrome has been using Autodesk VIZ software since he formed the company six years ago. "Initially we used it because it offered a powerful combination of 3D modeling tools and it interfaced with Lightscape, which is the software we were using at that time to light our models," he says.

Since then Autodesk has purchased Lightscape and has successfully incorporated Lightscape's most powerful lighting features into VIZ. "VIZ offers so many great features for lighting design," Noon enthuses. "It has customizable light sources, so we can take any of the software's source files and craft them into whatever we want. It lets us adjust factors like intensity, focus, and falloff on the various lights within a model. It provides IES files, which are photometric data files, provided by lighting manufacturers, which describe exactly what the light fixtures are going to do in a real-world installation.

And it has day-lighting tools, so we can analyze the impact of skylight and daylight on a project."

Noon adds that the software also enables Palindrome to add gobo effects, with filtering, for creating things like the effect of moonlight shining through the leaves of a tree. In addition, Palindrome can render lighting analysis studies in VIZ, using the software's Pseudo Color Exposure tool, which will tell them the actual numerical intensity of the lighting they are putting into their models. The software quantifies how much light is falling on a surface, as well as how much is being reflected. "Being able to provide both illuminance and luminance analyses is critical," says Noon, "because as lighting professionals, we need to validate to our clients that we aren't just creating pretty pictures.

We are accurately reflecting in our imagery how the space will look when it is finished. This way, our clients don't have to guess how their projects will look, and they can be sure that in a project's early stages the architectural design and the lighting design will work well together."

Today Palindrome relies on the capabilities in Autodesk VIZ 2006 to provide lighting design consultation services as well as to create complete, full-service design packages that include schematic design, 3D modeling and analysis, specification, documentation, and construction administration for commercial, residential, and historical projects.

One such design package that Palindrome completed recently was for St. John's Church, located in Severna Park, Maryland. As Noon explains, the church, built in 1959, had an interior meant to resemble Christ's tomb. As such, the entire ceiling of the cavernous, two-story-high church was painted black, and its walls were constructed of dark brown brick.

"It was supposed to be a very dark, introspective, quiet place, but the church is so big that it was intimidating," Noon says. "No one wanted to get married in the church because it was so dour looking! Soon, the congregation started complaining about the inside of the church. I'd say it didn't take more than a decade after the church was built before the congregation started wondering if they shouldn't have approached the design from a different angle."

Palindrome

After many years of debate and discussion, the church received approval from board members to move ahead with a complete remodel of the interior. Last year, the Archdiocese of Baltimore hired Kann & Associates Architects to develop a new architectural design for the interior, and Kann hired Palindrome to design the lighting for the remodeled space—in Noon's words, "to bring the church from night into day."

To build a 3D model of the church interior, Noon used as reference some rudimentary outlines and basic as-built drawings Kann & Associates provided in DWG format. These outlines and drawings reflected an earlier design that proposed a coffered ceiling that both Kann & Associates and Noon thought made the church look too much like a boardroom. So the architects invited Noon to manipulate the ceiling design into something that was more aesthetically pleasing, while also transforming the interior of the church from a dark and gloomy space to one that was bright and inviting.

First, using the Extrude tool in VIZ, Noon extruded the various curved dimensions of the coffers to form a T-shaped series of coves, with the crux of the T positioned over the main altar. Next, he gave the ceiling a variety of different treatments from which the church board could choose. These treatments included dramatic sky effects, which he accomplished by using the software's UVW Mapping tool to map drawings he created of the heavens onto the 3D model of the ceiling. In one treatment, the color gradates gradually from amber to blue, and in another it is soft and monochromatic.

Once the 3D model was finished, Noon began lighting the space. "We illuminated the whole church using the photometric lighting capability in VIZ," he recalls. "We used indirect lights to light the church interior, plus accent spotlights to highlight things like the organ pipes and the altar. We also used uplights in the coves, and we hung a few custom-built pendant lights from the ceiling, with the idea that if the church board approved the pendants, we could have them manufactured specially for the project."

Once they were done lighting the space, they rendered the images using VIZ Render. According to Noon, Autodesk VIZ enabled Palindrome to show the church board exactly what the remodeled interior would look like when lit with the new lighting design. As a result, the church board enthusiastically approved the project, along with the soft, monochromatic sky effect and custom fixtures, and construction is now pending, awaiting a green light from the new parish priest.

Palindrome achieved similar positive results for another church project in Baltimore, this one for Lovely Lane Church. This church, designed by noted architect Stanford White and built around 1870, originally was illuminated with gaslights, which made the interior quite dim by today's standards. For this project, Kann & Associates hired Palindrome to relight the church to meet modern lighting codes. "Our goal was to relight the interior, while maintaining the historical vibe so that it didn't look like we had infused a lot of electrical light into the space," Noon says.

Palindrome used VIZ to re-create Kann & Associates' architectural drawings in 3D, relying in particular on the software's Cross-Section Modifier to build the church's

elliptical domed ceiling. To light the space, they once again used the photometric lighting capability in VIZ, placing accent lights on the organ pipes and on the baptismal and pulpit areas, and indirect lights on the dome. In addition, they infused the sanctuary with soft light so that congregants would be able to see what they were reading, and they placed various historical pendants, which they modeled in Autodesk VIZ, under the balcony.

They also used the software's UVW Mapping capability for a key aspect of the project. "The church has a gorgeous star field painted onto its domed ceiling," Noon explains. "Decades ago, the Naval Observatory created a painting of the star field. We took a photo of that painting and used UVW Mapping to map the photo onto the 3D model of the dome. Once the space was lit, everything looked so realistic that people viewing the images thought they were looking at photos of the finished work." According to Noon, the Lovely Lane Church images won a 2004 Award of Merit from the Illumination Engineering Society of North America (IESNA) and a Historic Preservation Award from Baltimore Heritage. "The renovation is complete and looks spectacular," he adds.

Not all of Palindrome's projects involve churches. Another recent project the company completed was for Towson University. This project, which was handled by Gensler, a leading global architecture, design, planning, and strategic consulting firm, concerned renovation of an administration/classroom building on the school's Baltimore campus. For the project, Palindrome created images that showed the interior four-story glass atrium of the building illuminated at night, as well as the exterior of the building, also illuminated at night.

Palindrome created the model of the building in VIZ, using as reference CAD drawings that it received from Gensler. To light the building, the company placed indirect lights shining onto the atrium ceiling and direct lights lighting the atrium interior. "Outside, we used uplights on the building and accent lights shining into the surrounding courtyard," Noon explains. "The building also features an illuminated bridge on the third story that spans across the courtyard to a parking garage. It was a complex model, with a lot of connecting structural elements, and both interior and exterior lighting that we had to render in the same scene. But thanks to VIZ, we were able to pull it off."

Like it did for the St. John's Church project, Palindrome rendered the images for the Lovely Lane Church and the Towson University projects using VIZ Render. Although Noon says that each project was challenging in its own right, all of them were achievable, thanks to Autodesk VIZ software. "The key VIZ elements for us are its photometric lighting capability and its Pseudo Color analysis," Noon says. "When I need a crème de la crème image that is also highly accurate, I know that VIZ will deliver."

"VIZ has allowed Palindrome to stand out from the crowd in terms of photorealistic lighting design and rendering," he concludes. "We plan to continue using VIZ for all of our lighting design needs."

Workstation: Dell xps400
Processor: Dual-core Pentium 3.2
Graphics card: NVIDIA GeForce 7800gtx

Being able to provide both illuminance and luminance analyses is critical, because as lighting professionals, we need to validate to our clients that we aren't just creating pretty pictures.

Micheal Noon,
Certified Lighting designer and founder
Palindrome Lighting Design



C3D interactive

By Peter White

C3D interactive harnesses the power of Autodesk 3ds Max for design creation and process redefinition.



These days we need much more natural lighting, including moody sunsets and other volumetric lighting effects. People are shying away from unnaturally sharp, computer-like images. They want to get a real feel for what the final product will look like. With our process and a tool like 3ds Max, what you get is a far more rapid design process. This is because people are making decisions based on reality and not guess work, and I have always seen that as the future.

John Aspinall, founder
C3D Interactive



Images courtesy of C3D Interactive

Getting clients to change their habits can be somewhat of a challenge. For the innovative thinkers at Australian design visualisation company C3D interactive, the rewards are well documented.

John Aspinall, the company's founder is increasingly gaining attention for his practice and process from some of the world's leading names in architecture and design. Lend Lease, Norman Foster, Hassle and others come to his company for its advanced and somewhat unique process of design development. "What we have been trying to do for about ten years is to get architects and industry to appreciate that if the modeling and rendering facility is brought in early enough and with sufficient resources, it can be used to rapidly develop a design," explained Aspinall.

This involves bringing computer-aided design (CAD) forward in the process, in much the same way that filmmakers now plan and storyboard their visual effects from initial scripts. The result is a non-linear and streamlined approach that greatly enhances the entire design workflow.

Autodesk 3ds Max software is a cornerstone tool in the company's visualisation design process for several reasons. "It greatly assists us in terms of its ease-of-use, connectivity with core architecture programmes, and its strong compliment of renderers and plugins," explained Aspinall. "We love 3ds Max's dual strengths of flexibility and precision because it helps us to speed development and create detailed photorealistic images."

C3D interactive is, in effect, using 3ds Max to bring a form of virtual rapid prototyping to architecture. Ideas and their subsequent revisions are quickly modeled, which is why Aspinall feels that many in the industry are only realising half their potential.

"The big failing with most design practices is that they use design visualisation as a marketing function right at the end of the project. They lose some perspective on the possibilities for their own buildings and start when time is squeezed so it is too late to make any changes."

Aspinall and his team prefer to employ 3ds Max from the beginning.

"What we do is say to the architect, bring your idea to us when it is just a seed in your head, whether it be on a napkin or the back of an envelope. Let's model that idea up using our skills and work on that process collaboratively for a predetermined amount of time."

On-demand global creativity

The second part of Aspinall's plan to streamline and speed the design process has been to build a 3D pipeline that can function around the clock. Apart from his Sydney team of sixteen working from their Milson's Point offices C3D interactive has established satellite arms in China, United Arab Emirates, and Switzerland.

This allows teams of 3ds Max animators to work on a concept throughout their daytime window and pass it onto the next office, in a continual development process.

"The model can be worked in this way for as long as required and at each point—say morning, noon and night—we can assess different elements and see where the design is at," explained Aspinall. "I strongly believe that the model needs to be open to constant change. You can't get precious about the model. It is there to be manipulated like a lump of plasticine and the best designs I have seen keep the changes going right up to the very end."

Aspinall added, "In the end they will have a complete model that they can use as a source for a large amount of their Development Application presentation materials—all the elevations, a lot of the set shots, floor plans, and so on. The step from there to producing marketing materials is miniscule."

Making decisions on reality

3ds Max is also used for its animation potential during the design process. C3D interactive examine their creations from different perspectives to assist in making design decisions based on how the building is viewed in its eventual environment.

"For the architect and the developer there is nowhere to hide—you can see what is being proposed really early on and you can make realistic judgments from realistic viewpoints. We can show the view as if you are walking along the street looking at this thing, or we can place you in a moving car or across the street, looking out the window of the nearest office building," said Aspinall.

Once again, the possibilities thrown up by 3ds Max allow the architect to rapidly discover what is working and not working. The modeling and reviewing process is assisted by C3D interactive's use of V-Ray for 3ds Max. The raytrace renderer from the Chaos Group provides high-speed processing and realistic results.

For further information on C3D interactive and their design visualisation work visit www.c3di.com.au

Truescape Visual Reality

By Audrey Doyle



Images courtesy of Truescape.

New Zealand firm relies on Autodesk 3ds Max software to produce accurate and detailed simulations for proposed development and infrastructure projects. If a picture speaks a thousand words, the computer simulations that Truescape Visual Reality creates speak volumes.

Based in Christchurch, New Zealand, Truescape produces extremely detailed and accurate 3D simulations of proposed developments and infrastructure projects for clients throughout New Zealand and Australia. According to founder and chief executive Sam Chaffey, the projects Truescape works on—which have ranged from shopping malls and power stations to major roadways and mountainside holiday resorts—are particularly complex and are usually highly controversial, requiring planning hearings, resource consent hearings, and approvals from New Zealand's Environment Court as well as consultation with the public.

Truescape's mission is to ensure that the simulations it creates for these projects are highly accurate, and that they show the proposed structures in context with everything that will interact with them. Doing so enables Truescape's clients to communicate clearly all of the different aspects of their projects so that they can answer any objections that might arise due to misconceptions or perceived negative impacts.

To that end, Truescape's modelers and animators incorporate into all of their simulations not only precise 3D models of the proposed structures, but also accurate 3D environments based on contour and survey data which they have acquired from Terralink data, New Zealand's equivalent to United States Geological Survey data. They also acquire contour and survey data on a per-project basis from myriad engineering firms, surveyors, landscape architects, and other consultancies.

To build the models of the structures as well as their surrounding environments, the team relies exclusively on Autodesk's 3ds Max software. According to Chaffey, 3ds Max software offers numerous benefits, making it ideal for the work that Truescape performs.

For instance, he says, the software easily handles enormous models, which for a typical Truescape project can reach 95 million polygons. Furthermore, it is open and mainstream enough to work with the variety of different formats in which the contour and survey datafiles typically arrive. This can range from AutoCAD files in DWF and DWG formats, which are seamlessly compatible with 3ds Max software, to files in SHP and DEM formats, which the team is able to convert easily into DWG for import into 3ds Max.

In addition, Chaffey says 3ds Max software provides a host of tools that are particularly well suited to environment simulation. "For instance, we often use the Terrain function in 3ds Max to create a 3D land form of our survey contours," he says. "Then we use the Optimization option within the Terrain function to simplify the resultant mesh. That simplified mesh makes the model much easier to work with."

Sometimes, though, the team doesn't want to simplify the mesh, but rather, to add to it. "Quite often, we'll get contour lines that aren't detailed enough; that have long segments with only one or two vertices," says Andy Bryant, team leader. "With the Segment Divide tool in 3ds Max, we can easily add more vertices by subdividing those segments, thereby creating a more accurate terrain file and a shape that's more representative of the actual contours."

Chaffey says another benefit of 3ds Max software is the large quantity of third-party plug-ins available for it. For instance, the main plug-in that the team relies on often is ArchVision's RPC Content and Shadow Light plug-in, which they use to generate realistic shadows quickly and easily for the RPC content in their scenes.

Meanwhile, in terms of rendering, Chaffey extols the benefits of the scanline renderer in 3ds Max. "Our models are huge, but we need to be able to render them in a reasonable timeframe," he says. "With the scanline renderer, we can process huge files infinitely more quickly than we could with something like mental ray."

Although Truescape's simulations typically feature proposed buildings, industrial or commercial developments, or roadways situated directly within or close to existing neighborhoods, sometimes they show proposed structures that generate slightly more controversy.

One such simulation Truescape created recently was for Solid Energy Ltd., which required a simulation of Cypress Mine, an open cast coalmine it was proposing in Westland, South Island, New Zealand. Initially Solid Energy wanted the two-minute simulation so that it could depict the process of mine development to its management team. As the project progressed, they requested simulations to use in Environment Court to show the effect that the mine would have on the environment over the course of its 30-year lifecycle.

"This was a highly controversial project in an environmentally sensitive area," Chaffey says. "Solid Energy needed to be able to see that the project would be viable, and then prove to stakeholders, the public, and the Environment Court that it would not have a negative impact on the environment."

For this project, the team started by taking photos of the undeveloped area. They also collected design contours from the engineering company that designed the mine, as well as collected additional survey data from the mining company's in-house surveyor. Then they imported the data, which arrived in DXF format, into 3ds Max. "In addition, we surveyed our camera positions and controlled reference points, which means that we knew where we were standing when we took



Truescape

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Sam Chaffey, founder and chief executive
Truescape

the photos," says Jason Blair, senior 3D modeler. "By doing this, we were able to survey-fix the photos and accurately reference them to our 3D model within 3ds Max."

Using the photos and datafiles as reference, the team built the model of the site in 3ds Max, relying on such features as the Terrain function and the RPC Shadow Light plug-in to optimize the model and help ensure realism. Then they worked with a team consisting of landscape architects, mining engineers, ecologists, and planners to depict what the mine would look like throughout its lifecycle.

For this part of the project, the Truescape team relied extensively on the Material Editor in 3ds Max. "With the Material Editor, we were able to give a weathered and aged look to the site to show how it would appear over the course of 30 years," Chaffey says. "In the end, we were able to accurately depict how the rocks and other landscape elements would look down the road." According to Chaffey, the Environment Court has approved the project, and construction of the mine is scheduled to begin in 2006.

Another controversial project for which the team recently completed an eight-minute simulation was the Westwind wind farm, a development proposed by Meridian Energy for construction in Makara, North Island, New Zealand. "This very extensive wind farm was being proposed next to Wellington, which is New Zealand's capital city," Chaffey explains. "It's controversial because the wind turbine towers are about 375 feet tall, which is equivalent to a 35-story building. The proposal was to place 70 of them near a major population center, and some affected parties had lodged objections to the project."

To portray the wind farm accurately and in context with its surroundings, the team began by collecting contour and survey datafiles of the area. "We got our data from the Terralink data set, from surveyors, and from a major engineering company that compiled its data from high-definition aerial photographs taken by an aerial mapping company," Chaffey says. In addition, a local survey company provided road data, and the local utility company and an engineering company associated with the project provided data regarding the location of the utility lines. Like the Cypress Mine project, the data from this project arrived in a variety of formats, including DWG, DXF, and SHP; however, the team was able to convert all of the files into DWG format easily, and then import them into 3ds Max, where they built a 3D replica of the area.

Meanwhile, the team built the models of the houses, trees, and other elements existing in the area in 3ds Max, using as reference extensive video and photography that they took of the area. In addition, they built the wind turbine towers in 3ds Max, using manufacturer-supplied data they received from Meridian.

According to Blair, the Shadow Projection tool in 3ds Max was especially helpful for this project. "Using ray-traced shadows wasn't an option because of the time it would have taken," he says. "The Shadow Projection tool was great for use as our default shadow renderer, and it allowed us to ensure realism in the simulation."

Also helpful, he says, was the software's Scatter tool. "We used that to scatter trees over certain areas. If you need to build a natural forest of 5,000 trees, Scatter jumbles up the trees and makes them look like a natural forest. Once you've created the forest, you can change the color, size, and other characteristics of the trees to make them look even more realistic." Bryant adds that the Loft tool in 3ds Max was helpful when building the roads. "Using Loft, we could create the roads so that they followed the coordinates and data supplied to us by the surveyor," he says.

As this article was being written, Wellington City Council was conducting its local authority hearing to consider evidence for and against the project. Once it has considered the evidence, it will decide whether to grant planning approval for construction of the wind farm.

According to Chaffey, Truescape has achieved such success with 3ds Max software that it plans to continue using it for all of its simulation projects. "No matter what field you're in, you face competition, and the way to beat the competition is to be the best," he says. "In our field, if you want to be the best you have to be able to work with data that comes from a variety of people, and then produce models that are dead accurate and are placed in context within an environment that's also dead accurate. And you have to do that within an optimal timeframe and for a reasonable cost."

"That's what 3ds Max allows us to do," he concludes. "3ds Max has the tools that we need to ensure realism and accuracy in our simulations, and it's the least-proprietary platform available, so we can use it with the wide variety of data that we need to work with."



Images courtesy of Constructive Media



Constructive Media

By Peter White

The future of real estate marketing: Constructive Media delivers visual solutions using Autodesk 3ds Max

Building construction today is reliant on the ability of architects and designers to gain project development approvals and then successfully market their space to buyers. Both requirements increasingly involve the use of visualisation techniques to communicate ideas to each audience and one Western Australian company is revelling in the new found discipline.

Perth-based Constructive Media was launched two years ago to create 3D visuals for the architectural, building, and construction industries. "Most of our visualisation is of pre-construction images and animations of proposed multi-storey, mixed-use commercial and residential properties," said Constructive Media Owner Darren Kam.

"We outgrew a previous business and realised we needed more sophisticated software to keep up with client demands for more detailed images. Everyone is aware that creating virtual buildings is possible and they now want more realistic shadows and lighting and higher resolution images so they can see more detail in the buildings."

The company tried several software packages, but soon outgrew their technical restrictions and moved to Autodesk' VIZ software before adopting Autodesk' 3ds Max' company wide.

"We chose 3ds Max because it was an industry standard, so we knew it had a support base and there would be skilled VIZ people we could hire if we needed more staff. 3ds Max also had all the features we were looking for such as network rendering capabilities, together with its extensibility through the use of plugins," explained Kam.

"A bonus of the move was that we overestimated the time it would take to learn to use the features of 3ds Max. Because we had been heavily involved with Viz before we were able to get up to speed very quickly using the in box tutorials."

To produce the higher quality, detailed models, Constructive Media matched the 3ds Max V-ray plug-in from the Chaos Group to a small render farm to handle distributed rendering. "We now have plans to add 12 dual core processors into the render farm to achieve our goal of faster turnaround times for animations and even faster turnaround times for individual images."

Constructive Media is now busy producing a range of images for an expanding client base. The client's CAD data is imported as DXF files into 3ds Max for the creation of high-resolution 3D models. The models then become the source of a wide variety of marketing and promotional solutions to promote commercial and residential property developments. These include 3D animations, web sites, interactive programs, street signage, brochures, broadcast-quality video, and high-resolution print images.

"Once we get the CAD information together with a list of colours, materials, and design specifications in 3ds Max we can quickly export it as QuickTime or AVI files or whatever the client needs," said Kam. "Our images and animations enable everyone involved with the building to see what it is going to look like—from advertising agencies to the construction workers."

"City Councils are now specifying that applicants need to show some form of visual images before any development can go ahead so we can supply them prints. And of course our models are used as a design tool to help architects and designers as well. We have helped pick up problems such as small stairwells which would only have shown up in construction."

Shayne Le Roy Design

Shayne Le Roy Design provides an architecture design service where clients have the flexibility to achieve their dream home by having constant input in the design process. By working closely with Constructive Media clients move from 2D floor plans and elevation drawings to a set of 3D exterior and interior visuals of what they can expect to see on completion.

"Because we are working in a CAD-based environment, changes to the 3D CG model are quick and easy—something not possible with traditional watercolour perspectives," said Kam. "The ability for change also enables Shayne to use Constructive Media as a design/reference tool—he can request changes and we can provide him with comparison images to discuss with his client."

Devwest Group

The Devwest Group is a property development group specialising in unique high-rise residential/commercial projects for syndicates and individual clients. Working in conjunction with architects, Constructive Media creates massing models (3D CG models of a development and its surroundings), rendered in white, to represent the structure free of colours and textures.

This enables the architect and clients to visualise the overall impact of the development on its environment. These visuals are upgraded with constant feedback from the architect to incorporate finishes such as feature stonework, facebrick, cedar-lined eaves, etc.

"It is easy for us to visit suppliers to scan in samples of their products," said Kam. "We work closely with interior designers like Jodie Cooper to illustrate colours and texture options for everything from leather couches to shag rugs—we take digital photos and scans then recreate their look and feel using bump mapping or displacement mapping in 3ds Max."

A successful example of this process is the creation of multiple interior colour schemes in 3D, allowing interstate and overseas investors to visualise what their unit will look like. Visitors can log on to the Devwest web site (also maintained by Constructive Media), select an available apartment, select its colour scheme, and make an investment decision.

For more information on Constructive Media, please visit www.constructivemedia.com.au.

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Electric Art

By Peter White

The art of virtual photography:
Electric Art harnesses Autodesk 3ds Max
to create powerful print images



3ds Max is really easy to use and the combination of plug-ins extends its functionality even further—they allow me to develop a logical and tailored process for each project.

Bruce Bigelow, co-director and senior artist
Electric Art

Creating powerful images that communicate complex ideas and evoke emotions is the key to successful print ads.

For Bruce Bigelow, co-director and senior artist at boutique creative post house Electric Art, his adoption of Autodesk® 3ds Max® as a print production tool, has enabled a shift in the traditional advertising craft loop and the delivery of virtual photography.

“The toolkit has expanded to allow for creative freedoms that just aren’t possible with photography and Photoshop alone. 3D has allowed us to partner with clients to create the ‘hyper real,’ to bring to fruition environments and objects of great imagination, as well as deliver otherwise impossible images.”

Virtual photography simulates the original craft but through the use of Autodesk’s powerful 3D software involves an assortment of additional skills such as painting, sculpture, cinematography, and set dressing.

“Creating models is a large part of the job. The 3D work at Electric Art essentially replaces the traditional role of model makers who would fabricate custom pieces to be photographed and then sent to us to be retouched,” explained Bigelow. “But the greatest advantage of this workflow is the amount of control we can exercise over the images.”

Often the control is so precise, that when aiming for photorealistic results many can’t tell the difference, such as the Citibank campaign promoting the company’s association with the Australian Rugby Union. The brief from George Patterson Bates was to create a series of plastic money banks fashioned in the likeness of Australian players.

Through skillful polygon modeling, using the Facial Studio plug-in from Di-O-Matic, and reference photographs, Bigelow was able to create the facial structure of players such as George Gregan. A plastic look was achieved through a combination of texture layering and lighting to emphasise the specular qualities of the material.

The job is sold by fine details, such as the plastic mould seams that run the length of their faces.

The art of creating what’s not there is also shown in a series of print advertisements for Canterbury clothing. The idea was to create a visual metaphor of ‘toughness’ by constructing their famous sports jerseys in steel and stone. To model these organic objects traditionally would have proven difficult and time consuming. Instead 3ds Max was partnered with a handheld Polhemus 3D laser scanner to capture a 3D mesh of the jersey by literally ‘spray painting’ it with laser light.

“I stuffed the jersey with packing to make it stand up with volume and then scanned the whole thing. A series of passes gave us a mesh that imported into

3ds Max with great accuracy. Then I photographed sandstone texture plates to use as the surface of the model,” said Bigelow.

A selection of powerful 3ds Max plug-ins were then employed to complete the job. The features of Power Booleans, from Npower Software were used to ‘chisel’ off sections of the scanned texture while Ghost Painter (a Photoshop® integration tool from Cebas GmbH) was used to paint in extra relief, help map the textures and extract bumpmaps to further enhance the stone effect. The job was then rendered in FinalRender, a third-party renderer for 3ds Max also from Cebas GmbH, to take advantage of the software’s raytracing and global illumination system.

Complete virtual control of composition, lighting, and texturing are all essential elements in creating Electric Art’s hyper real effects. Bigelow explained that impractical camera angles and lighting are often the key to these shots. “The great advantage of 3ds Max is that I can create and play around with synthetic background sets the size of football fields such as those I designed for a Jaguar car shot by leading photographer Ian Butterworth.”

“Ian wanted a modern, architectural, and aspirational background with elements of backlight but an overall bright environment to match the car he would shoot. In pre-production we built a rough model and played with lighting and camera angles in 3ds Max. Photographers are blown away because I can light a shot with the virtual equivalent of a kilometer long soft box to create just the right look.”

It is this detail and quality that has seen Electric Art recognised with numerous awards and as innovators in the field of 3D for print advertising. Bigelow is pleased to be able to deliver upon the vivid visual metaphors of clients and concedes that although he once gave up his summer holidays to learn 3ds Max, he now can’t imagine life without it.

“I think it’s a very smart and obvious move for any modern digital artist these days. Working with 3D gives you greater creative scope, you can recreate things in the most hyper realistic or stylised fashion. It’s kind of like the change that occurred with cameras and scanners. They gave you a way to capture images—a way to add to a project, it was like sampling music. 3D takes this non-linear method a step further.”

“Rather than stitching an image together, as long as I have a clear concept, 3ds Max allows me to define a vision.”

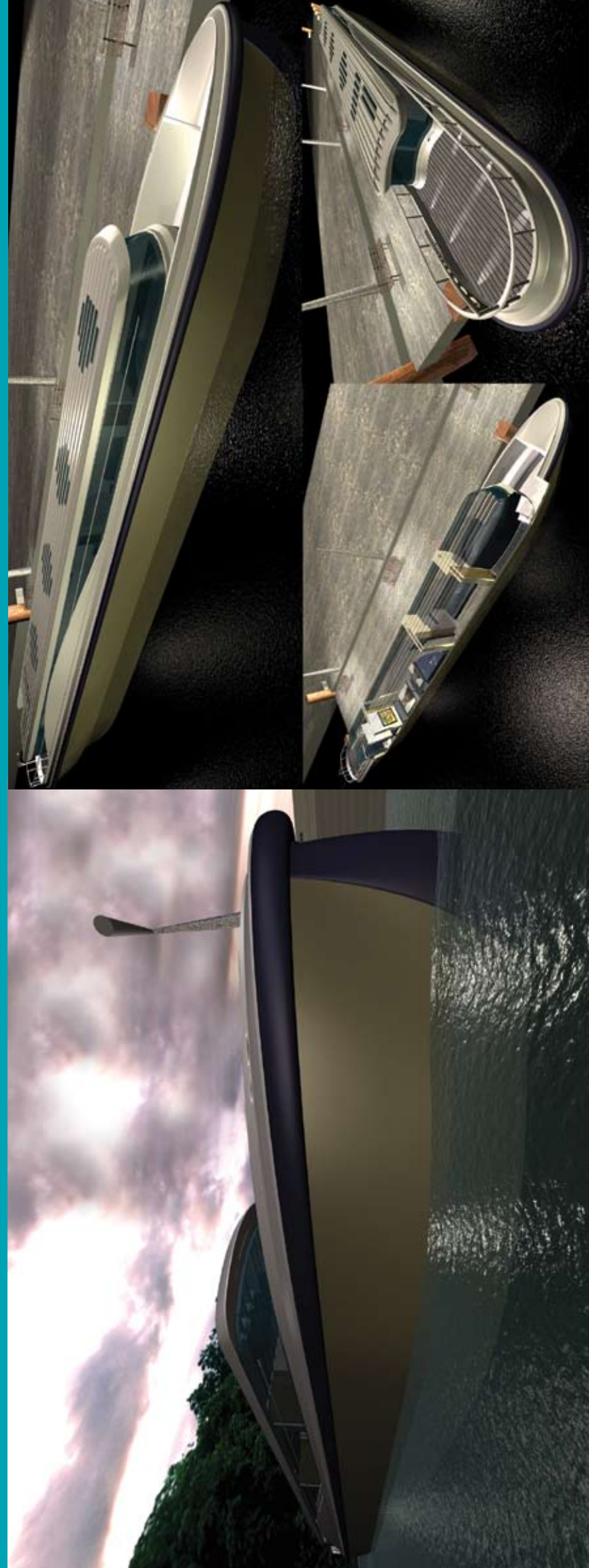
Electric Art is owned and operated by Jonathon Eadie and Bruce Bigelow—for further information, please visit www.electricart.com.au.

Images courtesy of Electric Art

Oneoffdesign

By Peter White

Images courtesy of Oneoffdesign



Dreamboats by design: oneoffdesign finds creative freedom to float new creations with Autodesk 3ds Max and AutoCAD

At the end of day, it's the 3ds Max animations and images that excite bank managers, engineers, and accountants. You need to appeal to those with the tendency towards logical thinking and while they may appreciate the artistry of a great concept or architectural drawing, they often find it difficult to visualise the final object without realistic images. When they see a 3ds Max model with all its lighting, reflections, and shadows, it is that notion of reality that convinces them to make the investment.

Brent Philp, founder oneoffdesign
oneoffdesign

Boat building is a true mix of artisan craftsmanship and engineering and Brent Philp's use of Autodesk design software has led him to a creative enterprise that has improved industry efficiencies.

The 38-year-old began work in Australian shipyards, but emerged this year as an accomplished and awarded design student from the Queensland College of Art. His final year project, a futuristic and environmentally friendly canal boat, earned him a commendation by the Royal Institute of Naval Architecture at London's Boat Show in 2005 and an award of merit in this year's Queensland Design Awards.

Philp has now established his own concept boat design business, oneoffdesign, and is utilising traditional hand drawings and his new skills in Autodesk® 3ds Max® and AutoCAD® software to make his mark in this lucrative industry niche.

"While contracting to the mega yacht industry in Perth, I became really interested in design development," said Philp. "I met some of the world's best boat designers and spent a lot of time talking to the CAD design teams. I had been thinking of what I wanted to do with the rest of my working life and decided design was the way to go."

To hone his technical and creative skills, Philp embarked on further studies at Curtin University, and then two years at the Queensland College of Art. After initial graphic design training in photography, Photoshop, Quark and Freehand he moved to AutoCAD, 3ds Max and Autodesk Cleaner.

"I could always draw but the Autodesk programmes took me to the next level and gave me an avenue to digitally develop what I had always had in my mind's eye."

His practical experience showed him that thorough computerised concept design and development provided several paths to saving time and money in boat construction.

"I see AutoCAD as the foundation of every project—it is fast, accurate, and I complete 70 percent of each job with it. Because we are thorough with our design and we actually use AutoCAD to specify materials and colours from catalogues, the large teams involved in shipbuilding aren't held up making those choices. You can be very accurate with AutoCAD, and we combine that with research into materials to produce complete drawing sets."

From there Philp imports the AutoCAD files into 3ds Max to complete the visualisation process and produce further efficiencies.

Computer precision sets the sail

"3ds Max is the first programme that I have come across that is truly limitless in its application—you can deal with 2D and 3D images and you've got 4D, which is the addition of time or animation. The realistic detail you can obtain using the lighting, shading, and other tools that come with the program is astounding. Which brings me back to what we do—by creating good concept models up front we can show the teams building the ship what they are required to create, which allows for a smoother construction process and involves them from the beginning," said Philp "And that's where 3ds Max comes into play—our work doesn't leave a lot to the imagination."

"When you are paying a lot of money for something you don't want to leave a lot to the imagination!"

3ds Max also provides a big part of Philp's competitive advantage by enabling the marketing of concept designs before construction.

He is keen to utilise the Cubicspace rtre (Real Time Render Engine) plug-in that allows his clients to interact with his 3D models on their own computers, without the need to install AutoCAD or 3ds Max.

"It opens up a wonderful world for the clients, where they are able to go into their proposed boat, have a look at it from every angle, and make decisions early on—its saves expensive decisions at the end of project." His use of 3ds Max also enables the 'reverse engineering' and construction of components.

An example is the development of metal or composite forms where a mesh panel is deformed in 3ds Max to match a part of a model boats structure. Philps then works backwards, by exporting the data out of 3ds Max and back in to AutoCAD to create drawings, specifications and instructions for the part to be cut out and formed.

"At the end of the day Autodesk software is used by the majority of those in this industry. It is the base from which they write their plug-ins and move files in and out of. As much as Adobe attacked the graphics market, Autodesk has successfully targeted design and visualisation. 3ds Max is a wonderful programme that goes far beyond product visualisation—it can do anything I want it to do!"

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