

Pictures are the realization of your ideas.

Autodesk develops high-performance, state-of-the-art creative tools that let artists—both 2D and 3D—collaborate and share assets across the whole production pipeline.



© 2006, Bonne Pioche, *La Marche de L'Empereur*. Image courtesy of Éclair Laboratoires.

Giving your pictures legs.

In film production, you need to bring many specialized artists together to work on a large numbers of shots. Autodesk provides creative solutions to help you use

color and light to shape the look of your story, create amazing VFX and CG, manage your collaborative workflow, and share digital assets across your production.

We're thinking about the whole—from creative tools to efficient data management—so you can think about creating the picture.

Sony Pictures Imageworks

By Claudia Kienzie

NARNIA™ © Disney/Walden, The Chronicles of Narnia: The Lion, the Witch, and the Wardrobe. All Rights Reserved. Images courtesy of Sony Pictures Imageworks.



Bringing *Narnia's* fantasy world to life.

The Chronicles of Narnia: The Lion, the Witch, and the Wardrobe was challenging by virtue of the complexity of its visual effects and the short timeframe in which hundreds of shots had to be completed. A holiday 2005 blockbuster produced by Walt Disney Pictures in association with Walden Media, *The Chronicles of Narnia* brings viewers into the incredible world of fantasy and adventure created by C.S. Lewis.

With more than 1,400 visual effects shots, the workload associated with *The Chronicles of Narnia* was divvied up between three major visual effects companies: Sony Pictures Imageworks (SPI), ILM, and Rhythm and Hues. Over 600 of the shots were created at SPI, which engaged the talents of its 3D animators and visual effects compositors, who used an arsenal of Autodesk® technology.

Incredible 3D Animation

SPI's film workflow used Autodesk® Maya® 3D animation software seats where many of the movie's 3D talking animals—including wolves, beavers, and a fox—were created. After the basic polygonal characters were developed, these 3D Nurbs "puppets" were moved to the Rigging department where they were refined.

"All of SPI's animation work for *Narnia* was done in Maya, with 3D characters moving back and forth between our design and Rigging departments. We took great care to design characters that would be extremely believable whether they were CG wolves interacting alongside live-action wolves or fantastic, mythical creatures, such as Mr. Tumnus, a fawn, who is essentially a man with goat legs," says David Schaub, SPI's animation director. "Maya offers us all the tools we need to perfect the appearance and movements of our characters down to the smallest detail."

The Rigging department builds the skeleton and musculature into the character and applies the deformers that need to mimic muscles and tendons moving under the skin. "Because of the system's open architecture and software development kit, our riggers could take Maya further by writing their own muscle-based facial animation control system," says Schaub. "For *Narnia*, the ability to develop custom tools and deformers greatly extended the reach of Maya to cover all our animation needs."

Lightning Fast Rendering

SPI also employed six seats of Autodesk's Discreet® Flame® system, considered the state-of-the-art system for movie effects work, all running on SGI workstations. Facilitating a highly efficient film workflow, all of the Flame boxes could off-load even the most complex visual effects composites onto the Autodesk® Burn™ background processing software.

"The increased speed Burn provides for rendering allows us to quickly implement client feedback and provide a result in many cases while they are present,"

says Jason Anderson, SPI's interactive compositing production manager. "During *Narnia*, there were countless occasions where Burn streamlined our workflow and assisted us in meeting deadlines with its efficiency and rendering speed."

Breakthrough Visual Effects

The Flame team—which included artists Lisa Deaner, Dave Takayama, Todd Mesher, Rob Blue, Doug Forrest, and CG Supervisor Dave Smith—completed complex visual effects shots which harnessed many of the powerful Flame tools, including Action, 2D and 3D tracking, 3D and modular keying, color warping and color correction, painting, de grain and re grain, rig removal, camera tracking, multilayered green screen compositing, and more.

For an effects shot involving footage captured from a helicopter flying over a forest, Takayama had to remove a lake and mountains from the background while preserving the tree line of the forest in the foreground. He dropped into the background a matte painting that featured an ice castle sitting on a lake; animated the water to create waves; and added glints, glows, and flame flares on the castle to give the fabricated scene a more photorealistic finish.

"The Flame desktop environment makes organizing shot elements very intuitive. You can see most of everything right there in front of you without searching through file directories and then previewing individual frames," says Blue. "Also, effects shots are almost never 'locked off' anymore. So, Flame tracking tools, especially the camera tracker, proved to be essential for creating realistic, seamless results."

In another difficult shot in *Narnia*, footage taken from the helicopter flying over a mountain contained a hotel on a mountainside below. Deaner had to remove this hotel and replace it with rocky cliffs and layers of trees, a process that really maximized Flame camera-tracking capability. Deaner also replaced dull, hazy skies with an early morning sunrise to give the scene a wintery look.

"Our pipeline uses a centralized 'shot tree' which can be directly accessed from every workstation. Batch's LUT (Look-Up Table) node gets used quite frequently to integrate linear CG elements with log background plates," says Blue.

"The greatest challenge in *Narnia* was the sheer scale of the plate preparation work," Blue adds. "The tools within Flame, in conjunction with Maya and Burn rendering, enabled us to execute all of *Narnia's* most demanding tasks successfully."

Schaub agrees: "The real breakthrough with the effects work was that we were able to complete over 600 effects shots in just eight months. The flexibility and power of Autodesk's tools made it possible for us to meet this remarkably fast turnaround."





Besides providing unlimited color grading, Lustre also complements our other Autodesk systems, including Discreet Fire, Discreet Inferno, Discreet Smoke, and Autodesk Combustion software, forming an extremely powerful, tapeless network that will serve us well into the future.

—Mohsen Sadeghi, Owner, Pixel Farm.

Mohsen Sadeghi had a vision for his Minneapolis-based facility Pixel Farm—to extend the visual effects and compositing they were doing for commercials and music videos to full-length feature films. While short-form projects tend to top out at HD resolution, feature films raise the bar to 2K and beyond, as well as require a digital intermediate (DI) workflow for finishing.

When he first heard about Discreet® Lustre® color grading systems software, he knew it was just the ticket. “Lustre is a software-driven, resolution-independent system capable of interfacing with our film scanner to produce the rich, pristine images required by demanding DI and collateral print work,” says Sadeghi, owner of Pixel Farm. “Besides providing unlimited color grading, Lustre also complements our other Autodesk systems, including Discreet Fire, Discreet Inferno, Discreet Smoke, and Autodesk Combustion software, forming an extremely powerful, tapeless network that will serve us well into the future.”

Banking on the Best

When Pixel Farm was ready to upgrade its color correction system, Lustre was still in development. But Sadeghi decided they would wait for it. In the meantime, he watched as many HD jobs went to his competitors who had just bought the latest da Vinci 2K (hardware-based) color corrector.

“We suffered a little bit in business until we installed Lustre in June 2004,” Sadeghi says. “Now, we’ve surpassed the competition, and by building on an open, scalable, versatile solution, we’re well-positioned for the future.”

Pixel Farm Colorist Dave Sweet explained that since Lustre capabilities are not tied to hardware, it is not limited to a small, finite number of “power windows.” “With Lustre, I can create twelve shapes, with separate control inside and outside each shape,” Sweet says. “Using the Lustre tracker, I can color-correct the area inside those shapes while tracking their movement within scenes,” says Sweet. “The da Vinci 2K comes with only three windows, but the user can add more—up to nine—at considerable expense.”

In an effect for a music video, Sweet used Lustre to draw a matte around a man’s red suit to preserve its color, and then he tracked it with a geometry that allowed him to separate the clothing from the rest of the image. In a medium shot, he could desaturate the man’s flesh-toned face and neck to a nearly black and white level without affecting the red suit.

“On Lustre, I can take color grading so much farther than I ever could on the da Vinci 2K because it’s not limited by a dedicated hardware platform,” says Sweet. “Also, while da Vinci color correctors are typically used at the front-end of the workflow during film to tape transfer, images can easily move to and from Lustre for color correction throughout the post-production. It’s more of a ‘virtual telecine’ concept.”

With a direct interface from an ARRI scanner, Sweet says they are able to bring 2K images as 10-bit Log DPX files into Lustre and color grade all that picture information to create the mood and tone for the entire piece.

In the near future, Sweet says they have plans to move to Lustre on the Linux® platform for even greater flexibility.

Complementary Systems

At Pixel Farm, artists find it extremely advantageous to move video between Smoke®, Inferno®, and Fire® effects systems without first having to lay it off to tape.

“More importantly, we can also move the metadata—files containing settings information for each project—which is hugely important to us,” says Kurt Angell, an effects editor/partner at Pixel Farm. “The complementary file structures of these Discreet systems means that when shots move back and forth between them, our artists don’t have to re-build everything from scratch.”

Tom Jacobsen, Pixel Farm’s senior effects designer agrees: “This would be completely impractical, especially for complex, multi-layered composites. Being able to transfer images and scenes between the Discreet workstations—complete with their settings, EDLs, color correction, effects layers, and other modifications—gives us an incredibly fast, efficient workflow.”

While Fire, Smoke, and Inferno can access each other’s databases, Pixel Farm also uses a NAS (Network-Attached Storage) called Sledgehammer® (from Maximum Throughput) to extend tapeless production to its other systems, including Lustre and Combustion®, as well as Autodesk® Maya®, Softimage® XSI®, and Apple® Shake® workstations. To move projects between these disparate systems, artists need only deposit files onto Sledgehammer or retrieve them from the NAS, all without ever touching videotape.

Dynamic Give and Take

Effects-intensive projects recently completed at Pixel Farm—including five national spots for Target and the Hilary Duff music video “Beat of My Heart” for Hollywood Records—benefited from the creative collaboration enabled by tapeless transfer of images complete with their settings files between their Discreet systems.

While the Target spots don’t look like they have any effects at all, considerable image manipulation was done using Fire and Smoke to enhance the appearance of talent and products. For the Hilary Duff music video, many creative looks were explored using tools in the Fire, Smoke, and Inferno systems. The Pixel Farm team was able to experiment with many layers of 3D wire-framing, green screen compositing, keying, tracking, DVEs, and color correction to create multiple versions of the music video for Harder/Fuller Films director Phil Harder to review and approve.

With the direct interface between Fire, Smoke, and Inferno, “We can move any part of any job to whichever artist or Discreet workstation is best suited to handle it,” says Angell. “And because all of our workstations can access files from the NAS, we are also maximizing the talents of our team and our creative collaboration is intensified.”



When we saw Lustre with Incinerator, we were amazed at what you could do without rendering. No other system could handle the same amount of secondaries and effects.

—Ivan Schmidt, CTO, ShortCut.

Founded in 1906, Nordisk Film is the oldest film studio in the world. But its Copenhagen post-production facility, ShortCut, is one of the region's most modern and advanced post houses. Ivan Schmidt, CTO, has combined Nordisk's heritage of a century of film experience with ShortCut's pioneering approach to technology in his efforts to develop new ways of making feature films.

"We're constantly seeking higher quality—both to meet our clients' demands and to keep our talented staff satisfied," says Ivan. "We like to face new challenges, explore new options, and be pioneers in our field. This business is a technical race and we like being in front, choosing the direction, and shaping the future of post-production. We take pride in being at the top. It's this kind of innovation that attracts clients and staff to ShortCut."

Ivan also cites the competitive advantage of being on the cutting-edge. "Investments may backfire if equipment doesn't live up to expectations or when prices drop, but in this day and age, we can't afford to slack. Our industry is threatened by small, one-man shops using desktop kits. We have to constantly improve the film production, and one of the most effective ways of doing this is by innovating."

Key to Ivan's vision is a digital intermediate (DI) workflow. "When you have a whole film on disc, it's much easier to move around and makes post-production much more straightforward," continues Ivan. "We all know only too well how delicate a negative is. With DI, you avoid damaging the original negative as you don't need to handle it or cut it."

ShortCut spent over a year looking at various digital grading systems for its DI workflow. The conundrum facing Ivan and his team was to find a solution that offered the creative freedom and flexibility of an open system which could process anything thrown at it. "When we saw Lustre with Incinerator, we were amazed at what you could do without rendering. No other system could handle the same amount of secondaries and effects," says Ivan.

ShortCut started alpha testing Discreet® Lustre® with Autodesk® Incinerator® systems software products in April 2005, and became the first facility in the world to purchase Incinerator. "The Lustre system allows us to focus on the creative side of grading. It gives our client more efficient grading time," says Ivan. "Lustre works in real time, in multiple layers, and with less rendering. It lets the colorist work on up to 16 scenes at the same time. As a result, the colorist and DoP can quickly form a general view."

According to Lustre Colorist, Sandra Klass, "It's very important to be able to work in real time with the DoP because it's like giving a presentation; you're selling an idea. Before using Lustre, I was working with real-time hardware grading systems, so waiting for rendering was really annoying. Incinerator gives me real-time performance of a hardware system but with the creative capabilities and toolset of a software grading solution."

Lustre Colorist, Thomas Thersilsen, adds: "We like to work at full 2K resolution so we can see all the details. Using Incinerator allows us to do this in real time."

According to Ivan, the most important factor in choosing a grading system is having a workflow that fit their facility. "We create all our effects work using Discreet® Inferno® and Discreet® Flame® visual effects systems and create 3D elements using Autodesk® 3ds Max® software. Lustre communicates with these systems.

We can export effects shots straight to Lustre and view them in the same suite as grading is done. It's a great advantage for the client and the colorist. It also saves time when we soft import from the SAN to Inferno for effects work because we don't have to import all the material, only what we need."

The next area of innovation that Ivan is looking to explore is the potential he sees in using Lustre and Incinerator for grading commercials. "We have clients who want to grade commercials the same way they grade feature film," explains Sandra. "We're very keen to explore this and we're certain that commercials grading will move towards a DI workflow in future. It has amazing potential and we're very excited about making the switch as soon as the demand is there."

ShortCut has recently graded several films using Incinerator, including *Johnny Was*, *En Soap (A Soap)*, *Lotto*, *Tempelriddernes skat*, *Den rette Ånd* and *Rene Hjerter (Clean Hearts)*. "Our clients have been extremely impressed with the performance of Incinerator," says Thomas. "They're particularly impressed with the real-time capabilities with regards to the number of shapes achievable in each secondary."

A co-production between Nordisk Film and Northern Irish production company Borderline, *Johnny Was* is ShortCut's latest international production. The goal was to create a natural look with highly-saturated colors. "Our biggest challenge was time, so working in real time with Lustre was exactly what we needed," says Peter Diemar, Lustre Colorist, ShortCut. "Once we boosted the film saturation, we needed to correct the color of skin tones. We were able to do this easily with the Lustre skin tone key. Using Lustre, colorists can find the look they need a lot more quickly."

Another example of where Lustre shines is when grading an overexposed scene with a man in front of a burnt-out window. Peter explains: "We were aiming to achieve more textures in the window, but we wanted to make the man lighter. Normally we'd have to do two passes, which is extremely time consuming, but with Lustre and Incinerator, we could use a broader range of light and dark by isolating the window, enabling us to work on both problems on the same frame at the same time.

"The fact that we scanned the film logarithmic, combined with the creative possibilities of Lustre, made it possible to enhance scenes that would otherwise have looked flat on the big screen. We also used Discreet Flame and Discreet Inferno to create numerous effects such as gunshots, laser beams, and blue screen shots, as well as titles and credits." "We're very proud of what we achieved in such a short time. The producers and the DoP were very happy and agree that we achieved the best result possible."

ShortCut finished working on the film in January 2006, in time for the Berlin and Irish Film Festivals in February. Their other production, *En Soap*, has just won two awards at the Berlin International Film Festival—Best First Feature Award, and Grand Prix of the Jury the Silver Bear.



Great ape roars onto the big screen.

Weta Digital relies on Discreet® Lustre® color grading systems software to help them establish the unique and stylized look and feel for Universal Pictures' *King Kong*.

When bringing the great *King Kong* back onto the silver screen, the filmmakers wanted to make sure viewers experienced a visceral, emotional connection to the great beast and the time period in which the film takes place. Digital color grading was used to create a look that's not contemporary and really connects the audience to the eeriness of Skull Island and iconic imagery of 1933 New York City.

Supervising Digital Colorist Dave Cole says, "Establishing the right look and feel for *King Kong* was an essential part of the storytelling. We achieved this with the Discreet Lustre system. This extremely powerful tool made it

possible for the film to appear realistic yet stylized. The grading capabilities of Autodesk's Discreet Lustre system have been used extensively, allowing the creative desires of the director, director of photography, and visual effects supervisors to be realized."

During the shooting of the live action—much of which was done in front of a green screen—Weta Digital needed the freedom to capture the actors' performances and then pull both the live-action and computer-generated (CG) elements together in post-production. They relied on the ability of the Discreet Lustre system to perform color grading both before and after CG elements were incorporated to maintain continuity of color and lighting throughout the film.

Weta Digital

"In post-production, we wanted to be free to experiment and discover what works best," states Dave Cole, Supervising Digital Colorist at Weta Digital. "Can this scene appear more realistic? Is there a way to make this shot more interesting? Do the highlights need a slight lift or do we need to pull more information out of the shadows? Discreet Lustre lets us explore these possibilities."

In setting the tone for the period in which the film takes place, lighting and color were key aspects during the making of *King Kong*. The non-linear workflow of the Discreet Lustre system influenced the film's creative process. The filmmakers knew they had control and flexibility in the digital grading post-production phase, which gave them more freedom while shooting. For example, when shooting took place at various times of day, scene lighting could later be corrected with the Discreet Lustre system to match the preferred lighting and time of day.

With five Discreet Lustre color-grading systems installed at Weta Digital in New Zealand, digital colorists were able to explore numerous options for the film's look. After scanning the entire movie using an ARRI film scanner, colorists took a few selected sequences into the Lustre system and put various looks on them to create "Color Bibles." Each Bible contained two or three digitally color graded shots. These were passed to Peter Jackson and the Director of Photography for review. Once approved, the Bible became the color reference for the final color grade.

"We used the Discreet Lustre system as part of the entire visual effects color grading process while making *King Kong*," says Joe Letteri, Senior Visual Effects Supervisor at Weta Digital. "We used it to grade at the front end and also at the very end of our pipeline to grade the final images. As the elements came in, the Lustre system helped us work out the look for complex environments like Skull Island and 1933 New York."

The end result is a stunning, stylized film in which color greatly enhances the viewer's experience and helped Peter Jackson and Weta Digital weave their fantastic tale of beauty meets beast.



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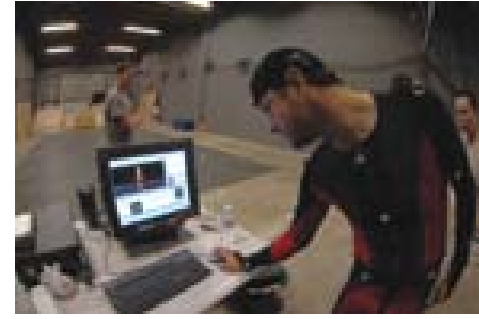
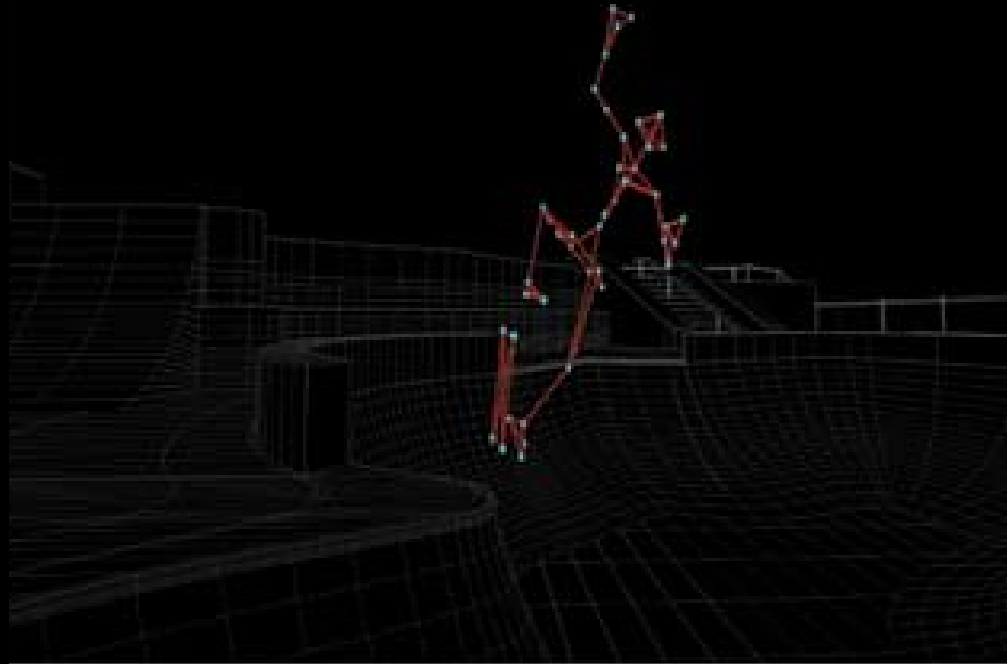
—Dave Cole, Supervising Digital Colorist for *King Kong*.

Mainframe Entertainment

By Karen Raz

Mainframe Entertainment brings Tony Hawk 3D skateboard feature to life with Autodesk MotionBuilder software.

Images courtesy of Mainframe Entertainment.



This was our first show using MotionBuilder software, but we are sold on integrating it more heavily into more Mainframe projects. MotionBuilder helped us on so many levels, but its efficiency as a pre-visualization tool is unsurpassed. We relied so heavily on MotionBuilder that we actually rewrote the ending of the film based on material reviewed in pre-viz.

Ben Burden Smith
Producer/Writer, Mainframe Entertainment.

Tasked with bringing the world's most legendary action sports figure to life in 3D, production company Mainframe set out to develop an animated movie pipeline that would deliver uncompromised, totally authentic skateboarding performances. This mission led Producer Ben Burden Smith and Production Designer/CG Supervisor Casey Kwan to develop a motion-capture and Autodesk® MotionBuilder™-based pipeline for the animated computer graphics (CG) feature Tony Hawk in Boom Boom Sabotage.

Autodesk MotionBuilder software was tapped during every phase of the filmmaking process, from pre-visualization and scene blocking to performance review and approval to editorial feedback and virtual cinematography.

The 70-minute comedy-action-adventure places Tony Hawk and his Boom Boom HuckJam skateboarding show at the center of the story as the famous skater is unexpectedly kidnapped. The kidnapper is the town's villainous circus leader, Grimley, who attempts in vain to steal Hawk's spotlight. It is up to the local skaters to rescue Tony and his show. The film was produced by Mainframe and Tony Hawk, and will be distributed on DVD in the United States by FUNimation Entertainment in the fall of 2006.

Motion capture footage of Tony Hawk skateboarding on the Boom Boom HuckJam ramp was shot using a Vicon system at Hawk's Tony Hawk Industries (THI) offices in Southern California. All of the street skating was captured at Mainframe's studio in Vancouver with performances by professional skateboarders including Chris Haslam, Alex Chalmers, Keegan Sauder, and a host of others. Mainframe built a modular skate park in their studio, complete with movable ramps and obstacles that could be pieced together and reconfigured to match the action demands of any given sequence.

Smooth Moves

One of Producer Ben Burden Smith's greatest concerns on set was how the performers' moves would translate onto their CG counterparts. The 3D villains didn't follow conventional human proportions, and establishing a stylized motion direction from the outset was imperative. With MotionBuilder, the team could map captured motion data onto characters immediately to see whether or not moves were working. Scenes could then be reviewed with performers, tweaked on the fly, and the performers could see themselves acting in the context of the shot, immediately placing them in the same 3D POV as the character they were portraying. "With MotionBuilder instant feedback, our performers were nailing their characters within thirty minutes. MotionBuilder was an invaluable performance tool from our earliest moments on set, it really helped drive the execution and success of the film's physical comedy," explained Burden Smith.

Since a lot of the action in this film takes place with performers on skateboards, the motion blending capabilities of MotionBuilder were key to delivering seamless sequences. In skateboarding, once a trick is complete, a skater might immediately launch into another move, stand around, or take their board off a jump—MotionBuilder allowed Mainframe to link up independent moves and have them appear to flow naturally.

Virtual Cinematography

Autodesk MotionBuilder software afforded the Mainframe production team an incredible level of creative freedom. The application's ease of use even allowed non-technical production staff, such as Mike McKinlay, professional skater and the Skateboard Motion Capture Director, to become very involved in the filmmaking. McKinlay, having no training in any 3D software package, learned MotionBuilder in a matter of days and ended up producing 95% of the film's skateboard cinematography. "This was so incredible to me as a producer—one of my greatest priorities on this film was to get the best, most accurate representation of true skateboarding for the discerning skateboarders and skate fans out there. It was so rad to have Mike—a pro skater—get into the virtual arena with full 360 angle camera freedom to produce what is some of the coolest skate footage ever. This authenticity is HUGE for our type of production!" said Burden Smith.

"MotionBuilder helped tremendously in terms of quantity of work and meeting our production schedule deadlines. We did a huge amount of motion capture, and without MotionBuilder it would have taken days—even weeks to review and evaluate the moves, but with MotionBuilder we had the directorial options to make changes right away—on the fly," Burden Smith continued.

Flexibility with 3D Pre-Visualization

The fact that MotionBuilder provided so many production efficiencies allowed the Mainframe team much more freedom with their shooting. "Generally with an animated feature, you're working from very tight storyboards, and you rarely stray from the predetermined shots. On this film we would try out multiple variations of camera moves giving us the option to play around with them in editorial. As a result, the visual language of this movie is much more akin to a live-action film in terms of look and feel," said Casey Kwan, Production Designer/CG Supervisor.

MotionBuilder also gave the producers more confidence as a team. They opted not to produce 2D storyboards to avoid the miscommunication that can occur when you try to translate a 2D board into 3D. Using MotionBuilder to create 3D animatics was a huge advantage in communicating and working with animators. "Everyone's speaking the same visual language; it was much easier to deliver feedback on shots. Making a film of this nature is so collaborative and being able to see sequences in 3D before committing to hi-res renders allowed us to communicate and review material together, knowing that we were on the same page visually," Kwan continued.

In the future, Mainframe hopes to integrate Autodesk MotionBuilder software more tightly into each production pipeline whether or not the project is based around motion capture. This project prompted Mainframe to start teaching more of its animators and directors MotionBuilder because of the incredible value the application provides on any project as a pre-visualization tool and as a framework directors can use for testing camera angles and experimenting with the cinematography during the pre-production stage.

Making your pictures better than real.

In post, it's all about satisfying your clients, selling their products, and making it look better than real. Deliver dynamic, high-quality content without breaking your schedule or budget. Create stunning commercials, standout promos, and amazing visual effects.

Make your facility a poster-picture image of a streamlined content creation machine. Use our legendary software to push the limits of your production capabilities, explore creative options, and produce the best possible results in whatever format you need—video, HDTV, or 2K cinema.

The Orphanage

By Audrey Doyle



© Paramount Pictures, Aeon Flux. Image courtesy of The Orphanage.

At this leading visual effects company, artists spend more time creating art, thanks to the high-end tools in Autodesk Maya and Autodesk 3ds Max software products.



Images courtesy of The Orphanage.

At The Orphanage, technology takes a back seat to artistry. "I consider visual effects to be moving surrealism," says Jonathan Harman, a CG supervisor at the company. "Just as Dali didn't spend all his time thinking about how the chemicals were mixed to make the paint he used, we don't want to spend all our time thinking about the software we're using."

"If we're using good software," he adds, "our artists will spend less time thinking about the technology and they'll spend more time being artists."

To achieve such artistic freedom, The Orphanage, a leading visual effects, production, and technology company based in San Francisco and Los Angeles, has integrated Autodesk® Maya® software and Autodesk® 3ds Max® software into every stage of its pipeline, from modeling to rigging to animation to rendering. "It's about direct manipulation. We want our artists to drive the creative process directly and not have to move through layers of abstraction and complexity to achieve their creative visions," says Dan McNamara, vice president of technology. "Maya and 3ds Max allow our artists to do that."

According to Harman, the artists have been achieving this goal with Maya and 3ds Max for several years, using Maya for modeling and creature work, and 3ds Max for shading, texturing, lighting, and rendering on projects ranging from feature films to television commercials to music videos. During that time, however, programmers at The Orphanage also had to bolster their production pipeline with proprietary tools designed to enable the software to interoperate.

Now that both Maya and 3ds Max are part of the Autodesk Media and Entertainment portfolio, the artists are looking forward to smoother interoperability between the two powerhouse packages. "We used to feel that having Maya and 3ds Max in our pipeline was both a strength and a weakness—a strength because each package has very strong features that complement each other and a weakness because getting data from one package to the other was an issue that required some heavy lifting on our part," Harman says.

"Today, we're using the FBX file format to transfer data between Maya and 3ds Max, and we're looking forward to having even more synergy and interoperability between the two packages in the future," he continues. "This will turn what used to be a weakness into a very important strength."

Over the years, artists at The Orphanage have relied on the varied and robust tools in Maya and 3ds Max to create stunning digital effects for a multitude of projects. Most recently, the company created effects for the movies *Harry Potter and the Goblet of Fire* and *Aeon Flux*, and it is currently working on effects for *The Host* and *Superman Returns*. As the team explains, each of these projects has presented CG challenges that they have been able to overcome, thanks to certain features and capabilities in Maya and 3ds Max. In *Harry Potter*, for instance, one of the team's responsibilities was to create effects for the scenes comprising Dumbledore's pensieve. According to the story, a wizard can remove a thought from his mind and place it in a pensieve, which is a magical object that stores memories. This leaves the wizard with a clear, fresh mind to concentrate on more pressing matters.

At one point in the film, Harry falls into Dumbledore's pensieve and ends up in one of the elder wizard's memories of a trial that took place sometime before. The artists used Maya to model the environment—an elaborately detailed trial chamber measuring eight stories high and weighing in at 3 million polygons. "Maya is great when it comes to handling huge, very detailed and dense models like this one," McNamara says.

In addition to the size of the model, another challenge concerned rendering it, which they accomplished in the Brazil Rendering System in 3ds Max. For this task, the team found the Per-Pixel Camera Map plug-in to 3ds Max particularly helpful. The Orphanage artists developed the plug-in for their work on the film *Hellboy*, and Autodesk began packaging it with 3ds Max version 7.

As Kevin Baillie, associate visual effects supervisor on *Harry Potter*, explains the artists rendered the trial chamber environment via projection mapping, a technique that relies on the theory of matte painting from the camera's perspective in that artists work on only what the camera will see. "It allowed us to take this environment whose look we had developed to a reasonable state, render out a few different views of it, and hand them to our matte painters, who painted on the frames all the details that would have been too difficult or would have taken too long to do in 3D," he says.

Then the matte painters handed the views to the 3D team, who used the 3ds Max plug-in to project the paintings back onto the Maya geometry and render them through the 3D camera in 3ds Max. "As a result, when we flew the 3D camera through the trial chamber, it looked like we were moving through this beautifully artistic environment," he adds. "With this tool, we made that environment really sing."

The Per-Pixel Camera Map plug-in also played an important role in the artists' work on *Aeon Flux*. According to Harman, who was a technical director on the film, one of the team's more-challenging shots concerned the gigantic city of Bregna and the lush forests surrounding it, all of which they modeled in Maya and textured and rendered in 3ds Max and Brazil. "In this shot, we flew the equivalent of 50 miles through and over the CG forest, and then into the CG city," he says.

In addition to adding a heightened sense of realism to the environment, the plug-in enabled the team to accommodate changes quickly and easily. "In a big shot like this, it was important for the director to be able to ask that the trees be greener or the walls on a building be mossier, for example, and for us to be able to make those changes quickly," Harman says. "The matte painters just had to go in and paint the trees greener and paint more moss on the walls. We didn't have to re-model anything."

Another challenge on *Aeon Flux* that the Autodesk software helped the artists overcome concerned the metal spheres the title character used to escape from prison. Prior to her imprisonment, as *Aeon Flux* crept along a maze of hallways en route to her assassination attempt on another character in the film, she had released several drops of liquid from a ring. While she's trapped in her cement cell, she whistles; the drops of liquid pop up off the floor and transform into metal spheres, which roll to her cell, assemble on an exterior wall, and explode, freeing her.

To handle the challenge of creating the spheres' photorealistic reflective surfaces, the team turned to the image-based lighting tools in Brazil and 3ds Max. "We used high-dynamic-range images captured on set to light the spheres and create the reflections," Baillie says. "If something has a bright highlight on it and it moves quickly, you want the motion blur to act properly when the object is moving—the highlight should streak and stay crisp and hot, and the rest of the object should get blurrier. We couldn't have achieved this look on those metallic spheres if we didn't use the image-based lighting technology in Brazil and 3ds Max to light the objects and map the reflections."

As an aside, Harman and Baillie equate the complexity of the reflections in these shots with the work the team completed recently for a Sprint/BMW commercial

The Orphanage

called “The Build.” At one point in the commercial, as an actor reaches for the car’s door handle, you can see the reflection of his arm on the side of the door.

“For this commercial, we had to create some tricky blurry reflections to provide an extra level of photorealism,” recalls Harman. “The idea is that if you put your hand on a car and then take your hand away, as your arm moves away from the car its reflection becomes blurry but the reflection of your hand remains more in focus. With Brazil, we were able to get that extra level of photorealism; that blurry reflection.”

The team also had to do some tricky shader work in this Sprint/BMW spot to get the metallic look of the paint on the car. As Baillie explains, a car with a metallic finish actually has two layers of paint materials: base layers of paint with metallic flecks that provide the sparkles, and a clear coat on top that provides sharp reflections. “With the layer shaders in 3ds Max and Brazil, we were able to create the look of metallic paint on the car, which was necessary in order to sell the look of the car.”

Another benefit of Brazil and 3ds Max on all of the team’s recent projects was the products’ support of the OpenEXR format. OpenEXR is the open source, high-dynamic-range file format developed by Industrial Light & Magic for advanced imaging in movie production. The main advantage of the format is that it allows up to 32-bit floating-point pixels and multiple lossless image compression algorithms of up to 2:1 lossless compression on film-grained images.

According to Harman, support of this file format has enabled the artists to speed up the rendering process on their projects. “Extra channels—for instance, a depth pass, or a vector channel pass, or an object ID pass—are included inside the file format, which in compositing can be broken out and used in different ways,” he says. “For example, a vector pass can be used for motion blur, or a Z-depth pass can be used for fog to give more depth to a scene.

“Previously, we would have had to run out an environment fog pass to get depth into a scene, or run out a multi-segment motion blur where the camera goes through a scene repeatedly, and they would have been separate renders and separate elements taking up space on our network and taking up time on our renderfarm,” he continues. “Having that integration in the one OpenEXR file format has allowed us to render single files that contain all of that information.”

Although impressive, photorealistic environments and models aren’t the only specialty at The Orphanage. The artists also specialize in character animation, as reflected in two film projects currently in production: *The Host* and *Superman Returns*.

Produced in Korea, *The Host* tells the story of a mutant fish-type predator that emerges from Seoul’s Han River and begins attacking people. Baillie says that one of the biggest challenges for the team has been to set up a creature pipeline capable of handling the approximately 125 extremely long shots they must complete. “We’ve done creature work in the past, but nothing on this scale. So, we took a step back and reevaluated how we were doing things in our creature pipeline in Maya, and brought it to a new level.”

As Baillie explains, typically it can take a long time from when an animator creates a piece of animation to when he can see the animation rendered. For this project, the team must complete their shots within a tight deadline, so using the MEL scripting language in Maya and MAXScript in 3ds Max, the studio’s Brian Kulig developed a tool, called the Shiny Red Button, which is helping to speed up the process.

“This tool allows our animators, with basically a press of a button, to create an intermediate file that they can transfer from Maya to 3ds Max and render automatically on our renderfarm,” Baillie says. “In this way, they can see what the creature is going to look like in the scene, with basic lighting and shading on it. It really quickens the feedback loop and it’s a great example of the scripting flexibility of Maya and 3ds Max.”

The team also used MEL to write the Asset Monkey, an interface that is helping them to manage assets being tracked by their tracking system. “This really is helping the creature crew to work with the 20 or so different versions of the Host creature that we created for various purposes on the show,” Baillie says. “For example, there’s the swimming Host, the burnt Host, and the jumping Host, as well as high- and low-res versions. The crew created this script to be able to swap out the different incarnations.”

The revamped creature pipeline is also playing a role in the team’s work on *Superman Returns* for their numerous shots featuring a digital double of Superman. The image-based lighting and global illumination features in Brazil and 3ds Max are coming to the rescue for the digital Metropolis shots the team is working on. In addition, the team also is relying on the SyFlex cloth simulator plug-in to Maya to create the digital Superman’s billowing cape.

Since it was formed in 1999, The Orphanage has earned wide recognition as being a leading creator of visual effects for film and television, and has achieved much success with Maya and 3ds Max. “We’ve been very happy with what we’ve been able to achieve in these packages,” says Harman. “They offer very powerful features and capabilities that complement each other and our pipeline.

“These two products have been under our roof for a long time,” he concludes. “The interoperability between Maya and 3ds Max will only get better, now that they’re under the same roof at Autodesk.”

“The interoperability between Maya and 3ds Max will only get better, now that they’re under the same roof at Autodesk.”

Jonathan Harman, CG supervisor, *The Orphanage*.



Images courtesy of The Orphanage.

Industrial Light & Magic

By Claudia Kienzle

War of the Worlds™ © 2005 Paramount Pictures and Dreamworks. All Rights Reserved. Images courtesy of Industrial Light & Magic.



While ILM received 2005 Oscar® nominations for “Best Visual Effects in a Motion Picture” for *War of the Worlds* and *Chronicles of Narnia: the Lion, the Witch, and the Wardrobe*, this prominent visual effects company has proven itself a winner through its history of groundbreaking visual effects work.

For over a decade, ILM has had a hand in virtually every major, visual-effects-intensive blockbuster movie to hit the big screen. Steven Spielberg’s *War of the Worlds* and Disney’s *Chronicles of Narnia* both raise the benchmark for visual effects by intensifying the impact and realism of their extraordinary visual effects scenes.

ILM created effects magic for both films concurrently, with its artists switching between the *Narnia* world of fantasy and mythological creatures and the *War of the Worlds* destructive attack by alien invaders. The two biggest effects shots—the Bridge Scene in *War of the Worlds* and Coronation Hall in *Chronicles of Narnia*—both involved mixing hundreds of layers of CG and live action elements while striving for seamless realism.

ILM artists say they could not have completed these challenging, complex visual effects sequences with such riveting results in the tight timeframes they were given without the Discreet® Inferno® visual effects compositing solution and Autodesk® Maya® 3D animation software.

The Bridge Scene

In the Bridge Scene, Ray Ferrier (Tom Cruise) and his two children escape in a van as aliens attack and destroy the city around them. Heat rays, emitted from alien tripods above, hit the Earth and blow up a bridge overpass carrying cars, trucks, and people. The vehicles, including an 18-wheeler, come “raining down” from the bridge onto the street below and many buildings and people are vaporized.

“While this sequence starts out with the original film plate, it progresses to the point where the viewer is seeing miniatures from our model shop standing next to 3D-generated and true-scale, live-action buildings. The CG buildings were based on 3D geometry with photorealistic building facades projected onto them,” says Grady Cofer, Inferno supervisor at ILM.

“The real challenge to this compositing was that these 3D and live action buildings and vehicles had to fit together seamlessly and credibly, while maintaining the proper 3D perspective as you pass by them,” Cofer adds. “The ability to manipulate 2D objects within a

3D space is something that the Inferno does especially well. And it’s a capability that we use to full advantage here at ILM.”

The Heat Rays

ILM’s SABRE department, named after the light saber swords made famous by *Star Wars*, is based upon Discreet Inferno, Discreet® Flame®, and Autodesk® Burn™ technology. There are nine Inferno systems and three Flame systems, as well as a large “proc pool” devoted to Burn background render processing. Burn played a critical role in helping the SABRE artists meet extremely tight deadlines on these films because the creative work could continue on the Inferno systems after they’d “kicked off” renders to Burn.

“Being able to try many creative approaches quickly and have immediate feedback was a tremendous plus for conceptual effects like the heat rays. We tested many ideas—electrical bolts, pulse beams, laser lights—but we settled on a unique effect that looked like searing, glowing, greenish 3D plasma,” says Cofer.

The heat rays were created in the Inferno Action module using a particle generator that the artists used to “spray” particles along pre-determined paths. This sprite-based particle emission was then treated with glows and a greenish hue for a very innovative, organic look.

Creating Creatures

The climax of *The Chronicles of Narnia* features an immense, ornate hall which is the setting for the King’s coronation. Lining both sides of the main aisle are hundreds of creatures, both real and mythical, who watch as Aslan the lion, the children, and others walk by. The crowd is a sea of fascinating characters, such as half-man-half-horse, half-man-half-goat, and unicorns, which are made believable by how well the live action human upper bodies moved in relation to the CG animals’ lower extremities.

“This scene was daunting because we were responsible for creating over 30 different types of creatures within six months—far less time than special effects houses are typically given—and accomplish this without sacrificing any quality,” says Jeff White, creature TD (technical director) for ILM.

“Using Maya to its fullest extent, we devised innovative ways to streamline the rigging process. Although we had to create unicorns, centaurs, fauns, and other diverse mythical creatures, we determined that there were many similarities to their forms,” says White.

With Maya, we're always able to find really creative solutions to very complicated problems to get our creatures to look, move, and deform properly.

—Jeff White, Technical Director, ILM.

"We boiled all of the mythical creatures down to four basic categories—bipeds, quadrupeds, horse, and human, and then used those basic riggings as a springboard to generate all the creatures needed for the show," White adds. For example, a faun combined a human upper body with goat legs; however, they found that using the base rigging for 3D horse legs expedited the process without sacrificing quality. The base rigging or skeletal structure for the horse could also be modified to become a boar.

"Maya offers us a comprehensive toolkit to create rigs and deformations to really marry the live action and CG body elements together," says White. "Also, tools such as Maya Hair and Fur were exceptional for creating hundreds of horse tails and minotaur tails quickly."

Occasionally, the ILM animators exhausted the features in Maya and needed something more. "So our software people used the Maya API (application program interface) to extend the program to handle whatever task we needed to accomplish—for example, we wrote iSkin, a Maya plug-in, for skinning deformations," says White. "With Maya, we're always able to find really creative solutions to very complicated problems to get our creatures to look, move, and deform properly."

The Coronation Scene

"The biggest challenge in compositing the Coronation Scene was creating mythical creatures that had live action human upper bodies and CG creature lower bodies," says Kevin May, senior Inferno artist in the ILM SABRE department.

"Where the human part meets the CG part, there were a lot of integration and layering problems. For example, the human muscle flexed but the CG cloth over it did not. Or a belt worn by the centaur was married directly to the live action plate of the upper body but not the lower CG animal part," May adds. "So I used a lot of Inferno deformation tools and extended bicubics to get those to match up perfectly, and the complexity of doing that for a whole crowd of mythical creatures was quite extensive."

Another challenge was that some of the creatures were supposed to look very tall, so when they were shot, they stood on green screen platforms. But when these platforms were keyed out, they found that parts of the Coronation Hall floor had been obscured in the live plate. They used Inferno tools, such as rotoscoping, paint, and projected textures onto a bicubic surface, to fill in the missing portions of floor.

"Altogether, there were several hundred layers to composite, and we had the Inferno systems going day and night. We could finesse details—like the way CG cloth moved in relation to the character wearing it—without having to redo the entire shot," says May. "We broke up extensive shots into logical groups of layers, and started compositing from the background and working forward. The Inferno system's ability to give us immediate creative feedback, and having Burn handle all the rendering as a background process, was a huge benefit on visual effects shots as demanding as this."

Cofer agrees: "I don't think it's a stretch to say we couldn't have done these visual effects sequences without Inferno and Burn. There are many tools out there that let you stack up 50 rendered elements, but there's something else that Inferno has—it's providing for an artist's touch and that's what really matters. And it does so with flexibility and speed, and a user interface which is 'pitch perfect' in my opinion. It's the perfect tool."

NARNIA™ © 2005 Disney/Walden. All Rights Reserved. Images courtesy of Industrial Light & Magic.

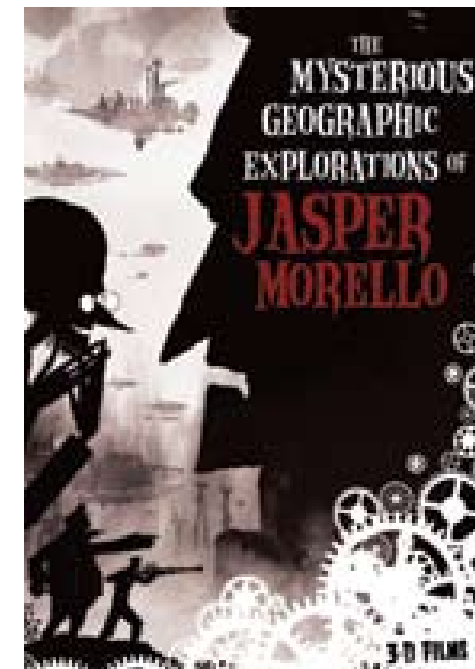


3D Films/Anthony Lucas

By Karen Raz

The Mysterious Geographic Explorations of Jasper Morello powered by steam... and a production toolset including 3ds Max, Maya, and Combustion.

The Mysterious Geographic Explorations of Jasper Morello. Images courtesy of 3D Films/Anthony Lucas.



We leveraged creative capabilities from an Autodesk toolset made up of Combustion, 3ds Max, and Maya to manipulate, model, composite, and lend realism and dimension to a film that at its core was based on a very non-technical, cardboard cut-out collage style of filmmaking.

—Anthony Lucas, Director
The Mysterious Geographic Explorations of Jasper Morello.

Australian director and animator Anthony Lucas is going nowhere but up these days. On the wings of an Academy Award®, a Grand Crystal award at Anney, two Australian Film Awards, a BAFTA nomination, and many other accolades, his animated short *The Mysterious Geographic Explorations of Jasper Morello* has been lauded with international recognition.

The 26-minute film, an adventure set in an imagined 13th century navigated by steam-powered dirigibles and inspired by Edgar Allen Poe and Jules Verne, was brought to life using paper cut-outs, 2D backgrounds, 3D models, and effects. Autodesk® 3ds Max®, Autodesk® Maya®, and Autodesk® Combustion® software products combined to form the toolset for creating 3D airships, particles, and clouds as well as compositing hundreds of 2D elements.

Creating Collages in 3D

Lucas developed a knack for stop-motion animation at age 11 and added to this knowledge of digital technology on the desktop while working on television commercials as an adult. *The Mysterious Geographic Explorations of Jasper Morello* uses a silhouette paper-cutting technique, with characters that were drawn on paper, scanned into the Adobe® Photoshop® application, and then “chopped up” into layers and manipulated digitally.

“There was a lot of 3D to 2D work where we would bring in 3D models, scanned artwork, miniature, and other layers into Autodesk Combustion as our program-of-choice for transforming and manipulating these elements and marrying them together,” commented Lucas. “Combustion was a real life-saver, especially because it accurately reads Photoshop files, provides a really sophisticated toolset, but is easy to learn and use.”

Digital Sculpting

Lucas’ cut-and-paste experience in stop motion also translated into his unique method of 3D model building. “I approach 3D model building in a very non-technical way. The way I build models is more akin to the way a sculptor works with found objects—and the 3ds Max user-friendly interface made it a practical and logical choice for this project.” Lucas purchased a variety of different ships from the Despona 3ds Max model library and disassembled them for ‘parts.’ These parts were then combined and reconfigured to construct the signature look of the vehicles and ships in the film. Airships animated and rendered in 3ds Max could be imported and tracked seamlessly in Combustion via the RTF file format.

Though they appear to be 3D, the backgrounds in the short were created using photographed miniatures and feature some 60-80 layers each. Photographs of the miniatures were brought into Combustion to manipulate the z-depth and create a very stylized landscape collage that seemingly exists in three-dimensions.

Atmospheric Effects

The Mysterious Geographic Explorations of Jasper Morello transpires in the clouds with many and various vehicles, such as dirigibles and iron ships—Lucas leveraged Autodesk software to add a range of essential particle and atmospheric effects. Real-time particle effects for chimneys, smoke stacks, etc., were created and tracked in Combustion onto 3D airships, which were modeled in 3ds Max. Autodesk Maya was integrated into the production pipeline exclusively to generate the clouds that dot the film’s landscape.

The film was written by Mark Shirrefs and the visual effects supervisor was David Tait. Artists who contributed to the film’s CG creation include: Animators Janelle Kilner, Brock Knowles, Jacob Winkler, David Cook and Anthony Lucas; Background, Layouts & Character Designers Jacob Winkler, Xavier Irvine, and Anthony Lucas; and 3D Artists David Tait and Fionnuala O’Shea.

The mysterious geographic explorations of Jasper Morello are indeed mysterious: the ground floats, aircraft defy physics, and a lack of reflecting light leaves the characters cloaked in silhouette. The look the film achieves is highly creative—a unique mixing of computer technologies that are of the moment and animation techniques that have been around for centuries.

Creating, managing, and sharing your whole picture.

Explore creative possibilities. Collaborate with other talented artists. Push the limits of your imagination. Whether you are in film, post, or broadcast, creating your whole picture means creating a more entertaining and more striking visual metaphor for the story you are telling than you ever have before.

Autodesk Media and Entertainment solutions offer the possibility of unmatched interoperability and collaboration throughout your production pipeline and are designed to accelerate your digital media creation workflow.

Absolute Post

By Claudia Kienzie

Images courtesy of Absolute Post



Autodesk's Discreet software fuels growth at London's Absolute Post.

Absolute Post has doubled its business compared to last year. We have built this business on an Autodesk infrastructure and pipeline, and the results have exceeded our projections.

—David Smith, Owner, Absolute Post.

Two years ago, when David Smith launched Absolute Post, he understood that clients' creative expectations were rising to extravagant levels, while budgets were constricting. He knew that to succeed in this tough, budget-conscious climate, his new business would have to run extremely cost-efficiently.

"I knew that to please today's demanding clients, we would need powerful, sophisticated, proven technology capable of realizing any creative vision with extremely credible, seamless effects," says David Smith, owner of Absolute Post, a London boutique specializing in high-end commercials, music videos, and cinematic projects. "For the caliber of work we intended to do, there was only one solution on the market that would meet all our needs—Autodesk's Discreet product portfolio. Autodesk has no competition."

"Absolute Post is able to operate with the cost-efficiency and flexibility that is critical to survival in the post business today," says Smith. "Considered the standard in the industry, Discreet systems pack a considerable amount of horsepower into a relatively small space, which helps a boutique like ours manage its overhead."

Versatility and Value

Building on a high-speed Autodesk® Stone® and Autodesk® Wire® networking infrastructure, Absolute has installed many Autodesk® Discreet® systems, including two Discreet® Flame® systems on Silicon Graphics® Tezro® workstations; two Discreet® Flint® systems—one on SGI® and one Flint HD on a Linux® platform; and based on a favorable beta-testing experience, a new Flame 2K on Linux. The facility now owns nine Autodesk® Combustion® software seats, which Smith considers a cost-effective workhorse he liberally deploys on virtually every job requiring 2D paint and effects compositing.

Also in the mix are three seats of Autodesk® Maya® animation software, which Smith says, "(he) bought because it has a fantastic toolset and produces impressive results. It's also an industry standard for 3D animation, which means I will always be able to find freelancers to work on the system if a demanding, complex job faces a very tight deadline."

Together, these products span virtually every imaginable tool an effects artist could ever need, including visual effects, compositing, 2D paint, rotoscoping, 3D animation, keying, tracking, color correction, and more.

The Discreet Flame, Flint, and Combustion systems are supported by a network of 64-bit Autodesk® Burn® renderers. "Burn has enhanced our productivity tremendously because time-consuming rendering is now done as a background process," says Smith. "Without it, we'd have to ask our clients to 'hold that thought' while we stop for render processing. Since we installed Burn, our clients have noticed that there are no longer interruptions for rendering during their sessions. We no longer lose creative momentum."

Collaborative Energy

When complex effects and compositing jobs come in, the footage is evaluated and the shots are organized on the hero machine, Flame, and then tasks are delegated to whichever system is best suited to handle it most efficiently.

"We like to have a mix of systems together in one room—like two Flame, three Combustion, and two Maya systems—so that our artists can work in a collaborative manner," says Smith. "And clients like being able to watch all aspects of their job progressing—such as rotoscoping and matte work on Combustion, 3D CG elements being created on Maya, and effects compositing on our hero machine, Flame."

Among the effects intensive commercial campaigns completed in this collaborative team environment are two spots for Snickers for Gorgeous Productions, and a commercial promoting O2's Business Unlimited phone service for Home Corporation and VCCP Advertising, in addition to spots for Conoco, Harley Davidson, Minute Maid, and Visa. Absolute has also posted commercials for many major mobile phone service providers, including Vodafone and Virgin Mobile.

"The harsh reality of business today is that clients expect us to bid the job based on their storyboards or scripts, and then they hold us to that quote," says Smith. "So it's vital that we invest in the latest and greatest technology that enables the most cost-efficient workflow possible."

Now in its third year, Smith says, "Absolute Post has doubled its business compared to last year. We have built this business on an Autodesk infrastructure and pipeline, and the results have exceeded our projections."



Brickyard VFX

By Kara Misenheimer

Images courtesy of Brickyard VFX.



Brickyard VFX goes the distance in HD with Autodesk Solutions.

Producing seamless composites and effects that help advertising agencies and production companies realize creative ideas is the order of the business at Brickyard VFX. Founded in 1999, the Boston- and Santa Monica-based visual effects studio has steadily built a reputation of excellence, whether it's turning a city into a sports nirvana for Mobile ESPN or dropping a menagerie of zoo animals into a barnyard for Budweiser.

A boom of work in high-definition and CG-intensive animation—including simultaneous production of Super Bowl XL and 2006 Winter Olympics commercial advertising campaigns—has seen Brickyard raising its profile and expanding its artistic team and tools. Brickyard VFX has owned solutions from Autodesk Media & Entertainment since its inception and now boasts seven Discreet® Flame® systems, a Discreet® Smoke® system, multiple Autodesk® Combustion® software licenses, and Autodesk® Maya® 3D software between its two headquarters.

"We do all of our color correction in Flame. We also use it absolutely every day for 2D tracking," says Geoff McAuliffe, Lead VFX Artist, Brickyard VFX.

The extensive features of Discreet Flame came in handy when Brickyard was tapped to complete effects end to end for the Super Bowl campaign "Sports Heaven" for Mobile ESPN. The spots, shot on 35mm film and transferred to HDcam SR, were finished in HD. The spots were laden with invisible alterations to live-action footage to create a world in which contenders—from top athletes to Indy car drivers to the 2005 Spelling Bee champion—appear at every turn.

Discreet Flame provided the power to make changes to picture, replace elements, and very selectively color-correct tons of details that could not be tweaked during telecine. Brickyard's Flame systems also delivered the features needed for super-nuanced work, such as creating garbage mattes and masking people out of frame. The huge final sequence in "Sports Heaven" is a good example of how Brickyard VFX maximized Autodesk technology to pull out all the stops, even in HD resolution—from adding marathon runners shot on green screen and painting out logos to rebuilding the skyline, re-lighting the scene, and sending CG jets and fireworks over the scene.

"In the commercials world, there's a lot of money behind each ad and pressure all the way down the chain to deliver the best quality work. Autodesk's deep toolset enables me to perfect things the way the agency demands," explains Mandy Sorenson, Compositing Artist, Brickyard VFX. "It's also critical to view and present our work in the proper resolution, such as HD."

Sorenson praises a number of indispensable features in Flame, including resolution independence for SD, HD, or 2K to efficiently deal with any size file and the Divide action, which lets Brickyard artists get a clean edge to isolate CG elements. She also notes the usefulness of bringing in and manipulating layers from Adobe® Photoshop®, the Distort tool for quick and easy warping, and using Batch in Flame to keep track of all processes.

"Considering how much we are now doing in HD and film, Batch in Flame saves us time and creative cycles because we don't have to pre-render most of our elements," she says.

Brickyard VFX

Bringing It Together with Smoke HD

Brickyard VFX's workflow allows its two locations to collaborate closely using a file archive system, saving work, sending it to FTP, and pulling in IFF files as needed. The studio's Discreet Smoke HD system often serves as the hub for conforming, editing, and organizing material.

"Our Discreet Smoke HD system is frequently the central hub of a project," states George Fitz, who mans Brickyard's Smoke HD workstation. "We like the timeline interface for keeping all of our elements, doing the main conform, editing, and doling out shots to our Flame artists. Its HD resolution capabilities are essential, especially since we're seeing nothing but HD productions these days."



Modeling and Animating the Whole World with Maya

Brickyard VFX delivered four jobs in HD, including the Super Bowl Mobile ESPN ads, and the Winter Olympics campaign (a series of spots for AT&T), in the same month. In addition to extensive compositing and effects, these commercials required heavy CG, created by Brickyard VFX's new dedicated 3D animation division using Autodesk Maya.

Maya was used for modeling, animation, texturing, and lighting setups by Brickyard's Robert Sethi and Yafei Wu, who would supply grayscale models or rendered elements that could be roughed in for placement and client approval in Flame.

"Maya is the backbone of our CG pipeline," Sethi says. "We love it for the ability to customize and write our own tools. It provides all the openness and flexibility we need to create things ourselves."

On the recent HD jobs at Brickyard, those "things" had the team fielding the creation of digital uniforms, baseballs, cars, airplanes, and even a city-park-sized Heisman Trophy one minute and then producing cities, mountains, and ski lifts the next.

"We've had just an incredible volume of CG work on top of our compositing and finishing. Having the right technologies and artists in place has made it possible for us to handle this high volume of work and multiple projects simultaneously," notes Yafei Wu, co-head of 3D at Brickyard VFX. "There's great collaboration within the Brickyard VFX team and we can imagine that helping bring new synergies and interoperability to our 2D and 3D processes is something that companies like Autodesk will be building on for a long time."

Images courtesy of Brickyard VFX.

In the commercials world, there's a lot of money behind each ad and pressure all the way down the chain to deliver the best quality work. Autodesk's deep toolset enables me to perfect things the way the agency demands.

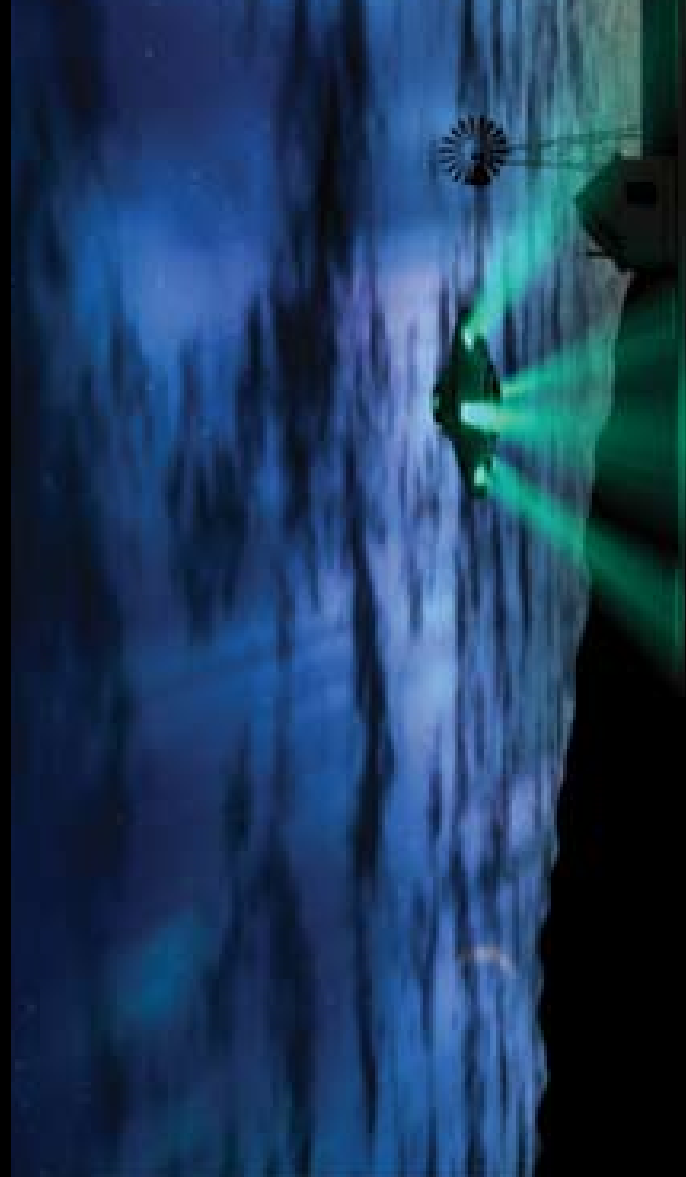
—Mandy Sorenson, Compositing Artist, Brickyard VFX.



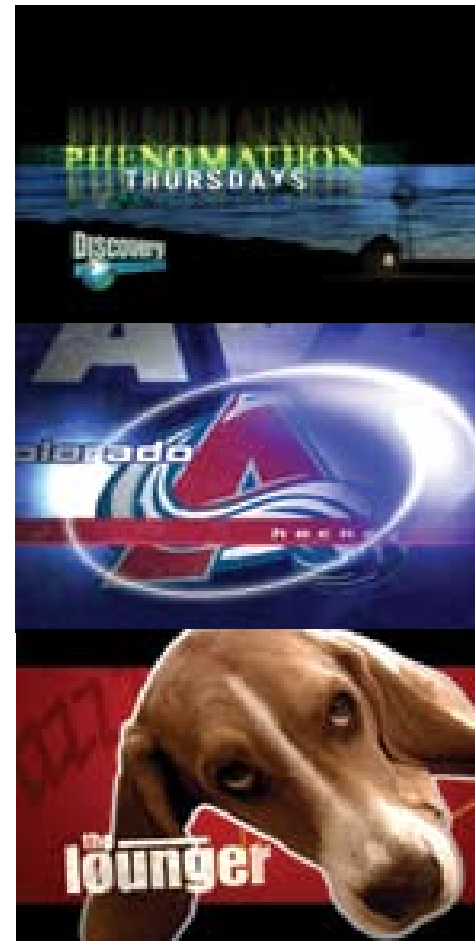
Impossible Pictures

By Claudia Kienzle

Images courtesy of Impossible Pictures.



Reaching the heights of broadcast design.



If broadcast design were an Olympic event, then winning a BDA award would be like getting the gold. Every year, the Broadcast Designers' Association (or BDA) recognizes the finest work in the graphics-intensive broadcast design field. At last year's BDA Awards in New York, Denver-based Impossible Pictures finished with one gold and two silvers thanks in part to its smart, innovative talent working with Discreet® Flint® and Discreet® Smoke® workstations.

"Broadcast design is a challenging field in which to work. The world that our clients live in is extremely fast-paced and decisions have to be made very quickly, all while maintaining very high standards," says Joel Pilger, President and Senior Discreet Artist for Impossible Pictures. "This means we have to be flexible, responsive, and fast. I would be very nervous about trying to satisfy our clients' needs using something other than Flint or Smoke."

Impossible Pictures relies on Autodesk's Discreet Flint and Smoke software, companion licensed software running on two Linux® workstations. A resolution-independent system with the ability to capture and play back RGB media, Discreet Flint 95 has a wide range of visual effects creation and compositing tools, including Action, the industry-renowned 3D compositing environment; layer-based paint; motion-estimation time warp; batch text; and high-speed, interactive tracking and image stabilization. Discreet Smoke 7 is a 64-bit, resolution-independent finishing system with features such as a complete editorial toolset, the incomparable Master Keyer and Colour Warper® functionality, 3D compositing environment, stabilizer/tracker, text module, and field-accurate I/O module integrated within one environment.

"I like that Flint provides a flexible creative toolset that accommodates designers' individual workflows for creating visual effects. I can execute ideas with ease and meet deadlines in a timely fashion," states Hector Espinosa, VFX Artist. "Among many great features, my favorite tool is Batch. Being able to build a tree of effects and timelines that coordinate with each other is a key component to handling revisions and quick turnaround."

Located in the heart of lower downtown Denver, the creative digital studio produces broadcast design and television commercials for network television and advertising clients. The company of directors and artists specializes in guiding their clients through a hands-on process to realize their most ambitious visions and offers full creative turnkey production, broadcast design, CGI/animation, editorial, visual effects, and compositing services.

Impossible Pictures has produced award-winning work for clients such as Disney, Universal Studios, Discovery Channel, The National Geographic Channel, DISH Network, Ford, Dupont, and Western Union, and has been honored with Emmys, Clios, Addys, and Art Directors awards.

"Many of our clients ask us to develop creative concepts for their project—be it a promo, station ID, program open, or complete channel branding package—and then execute it within very tight timeframes," says Pilger. "We're not an ad agency, but we're often called upon to act like an agency and be a complete creative resource."

That was the case with the launch of the Altitude Sports and Entertainment Network. This new regional sports network required a clever, eye-catching broadcast identity that would uniquely brand their regional sports coverage of teams such as the Colorado Avalanche (NHL) and the Denver Nuggets (NBA). The channel branding campaign that Impossible Pictures developed and executed won the 2005 BDA Gold award for Best Broadcast Design Package for Sports, and a Silver for Best ID.

"The distinctive look we created for Altitude flowed from the idea of 'in sports, when the ball moves, something amazing happens.' A visual theme was created using barometric pressure lines, and how the air reacts to a ball moving through it," says Pilger. "Within Flint Action and Smoke DVE modules, we used many tools, including displacement mapping to deform and distort the images around the balls, and sophisticated tracking to marry 2D rotoscoped footage and 3D animation elements." These effects were combined, layered, and edited to create a unique visual solution.

"We assign complex, time-sensitive projects to Flint and Smoke because we can absolutely count on them. And we get better results than can be achieved using any competing software," says Pilger.

One such project was a promo package for "Astronaut Diaries," slated for Discovery's Science Channel. The show featured video shot by one of the astronauts of the ill-fated Space Shuttle Columbia, which burned up during re-entry over Texas in 2003.

"Since this footage chronicled two years of training leading up to their journey into space from the astronauts' point of view, our concept for the promo was to have viewers see images through the glass of an astronaut's helmet," says Pilger. "Flint compositing tools were used to project and distort video on the amber-tinted, glass visor of a 3D helmet, and Autodesk® Sparks® plug-ins for lens flares and distortion completed the effect."

Pilger and Impossible Pictures' Smoke Artist Brian Eloë finished the promo package in Smoke, including the critical job of crafting appropriate edits considering the sensitive subject matter.

"Smoke is a very powerful NLE platform with a functional timeline for cuts, effects, color correction plus multiple tracks of audio...all at breakneck speed," says Eloë. "And, because Smoke also integrates many powerful compositing tools, a Smoke artist can go way beyond simple EDL assembly to really perfect and finesse the desired creative look for a finished piece."



KPBS-TV San Diego

By Kara Misenheimer

KPBS seamlessly meets HD effects and editing needs for broadcasting TV.

Images courtesy of KPBS-TV, San Diego.



Autodesk solutions are very versatile and that helps us be more versatile.

—David Streib, Broadcast Designer, KPBS-TV

KPBS-TV sets the bar when it comes to serving the local community. The San Diego-based public television station, which creates an array of informative and educational programming peppered with high-end graphics and animation effects, is also a model citizen in terms of its pipeline, now totally optimized for the production of high-quality, eye-catching content with speed and efficiency in high definition (HD).

KPBS made the switch to HD in 1999, electing to base effects and editorial around HD solutions from Autodesk. Today, the facility boasts a number of best-of-breed Autodesk packages that deliver artists unique capabilities as well as the ability to work quickly and creatively by exchanging works-in-progress, graphics elements, 3D models, and other files.

At the hub of the graphics department is a Discreet® Flame® and Discreet® Smoke® HD system, used on all projects for integrated effects and editing with remote rendering via a four-node Autodesk® Burn™ rendering network. This system connects via gigabyte ethernet with a PC running Autodesk® 3ds Max®, Autodesk® Maya®, and Autodesk® Combustion® software applications on a two-node render farm. The entire setup links, via four terabytes of shared storage, to a Discreet Smoke HD system housed in the station's editorial division.

"We really benefit with Autodesk solutions, because we have robust programs on a network that can 'talk' to each other," says David Streib, Broadcast Designer, KPBS. "We can do the work in Flame, Smoke, Maya, 3ds Max, or Combustion utilizing the best tools for the job and then pass things back and forth, such as composites from Flame to Smoke or 3D shapes from 3ds Max to Flame. Also key to our setup and to meeting our deadlines is Autodesk Burn, which allows us to send sequences to render while we keep working."

Streib produces KPBS's 3D graphics, effects, and design elements—from animated maps, charts, and show openers for the station's nightly newscast, to station branding, in-house-produced spots, HD documentary opens/graphics, community outreach projects, and fund raising. For anything quick and animated or that requires polygonal modeling, Streib turns to 3ds Max software, a program he has been using since its inception. "3ds Max is our primary tool for building 3D motion graphics because it's fast," he states.

For other work, such as visual effects involving fluid or rigid body dynamics, he'll switch to the Maya interface. "Maya makes it easy whenever I need to create, R&D, or animate a complex character or effect," Streib notes.

Desktop compositing in Combustion comes into play particularly on projects that benefit from quick template effects, such as HD documentaries or children's programming. Here, Combustion software provides ideal tools for re-sampling archival photos as clean images and it offers a wide array of effects pre-sets as well.

In the graphics and effects suite, Flame sees heavy lifting from Streib for finishing on all effects and composites. Flame is used for "quick-turnaround events," such as creating animated news show graphics or producing animated backgrounds and lower thirds going to air during fundraising broadcasts. It also is a workhorse for compositing and animating sponsored "underwriting spots," which represent a large percentage of KPBS's production work—and support revenue. "Discreet Flame fits right into our workflow to get things out in a quickly," Streib explains. "Within our arsenal of Autodesk solutions, Flame has become our central hub. Everything converges here because

people know their projects can be completed at the highest quality. Broadcast design has become a 3D medium—flat text over a flat image is just not enough. I think our supporters keep coming back in no small part due to the fact that they love the look we can achieve for them with spots done in Flame!"

Streib cites Flame integrated effects functionality as being a perfect fit for the high-quality, short-turnaround requirements of broadcast spot and 3D graphics production. Among his favorite features are Flame text modules and paint system built right into the Batch processor, as well as the system's powerful color correction tools.

More and more, graphics and editorial departments are collaborating on jobs where graphics meet editing, and KPBS's Autodesk setup gives Streib the flexibility to work in Smoke HD anytime he needs to deal with high amounts of video material or in a timeline edit fashion. He can also interface easily with Producer/Editor Tami Rogers, who runs KPBS's dedicated Smoke HD editorial bay.

"We can easily pull Smoke edited masters across the network," Rogers says. "I can produce a timeline with cuts and music and David can take that timed-out file and design the graphics with the bigger picture in mind. I can work in Smoke HD, which is really great for every single need we have in editorial, and I can integrate effects composites into my Smoke editing timelines. It's a simple way to collaborate."

Rogers particularly likes the DVE, Colour Warper™, and Axis Editor/Soft Effects functionality in Smoke, as well as the overall comprehensiveness of the Smoke HD toolset.

"Smoke HD speaks to the future of where systems need to be heading for HD," she adds. "It's well thought-out and I never need to exit the interface for what I need to do. That makes creating and delivering for deadlines that are 'right away' a lot easier."

KPBS's graphics and editorial artists deliver graphics and edited pieces for a total of three stations: KPBS HD, KPBS SD and Create, another PBS channel broadcast in SD. The integrated Autodesk workflow helps the station work at the high resolutions demanded in today's broadcasting, handling any task, format, or deliverable with a small and focused team.

"Autodesk provides us with a complete line of integrated creative solutions which gives KPBS the resources to better serve our community," Streib concludes. "I have all the tools at my fingertips to create something stunning, even if that starts out with someone coming in with only a handful of photos or a business card. In addition to handling all kinds of different source material, our setup is also very good for delivering on multiple masters and formats. We are constantly asked to produce and deliver in a wide range of formats, from HD and SD to providing files for DVD covers and print. It's a great advantage to do all of this at high resolution and in an integrated, networked, and collaborative fashion without having to lay out to tape."

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US West
The Landmark
@ One Market, 5th floor
San Francisco, CA 94105 USA
T 415.547.2000
F 415.547.2222

US East
12 W. 21st St., 12th Floor
New York, NY 10010 USA
T 212.338.8000
F 212.973.9350

US Central & Canada
730 North Franklin Street,
Suite 210
Chicago, IL 60610 USA
T 312.440.1200
F 312.440.1219

US South & Latin America
5201 Blue Lagoon Drive
Penthouse - Suite 979
Miami, FL 33126 USA
T 305.718.3470
F 305.718.3469

Europe, Middle East & Africa
Ingeni Building
15-17 Broadwick Street
London, England W1F 0DE
T +44.207.851.8000
F +44.207.851.8001

China
Unit 2911-2915
China World Tower II
No. 1 Jianguomen Wai Avenue
Beijing 100004, China
Tel: +8610.6505.6848
F +8610.6505.6865

India
201/202, Durga Chambers
Linking Road, Khar West
Mumbai 400 052
T +91.22.5695.2000
F +91.22.5695.2211

Japan
Triton Square Office Tower X 25F
1-8-10, Harumi Chuo-ku,
Tokyo 104-6025
Japan
T +81.3.6221.1818
F +81.3.6221.1800

Korea
1701, ASEM Tower 159-1
Samsung-Dong, Gangnam-Gu
Seoul 135798, Korea
T +82.2.3484.3442-3446
F +82.2.3484.3404

Singapore
159 Sin Ming Road
Amtech Building # 05-05
Singapore 575625
T +65.6552.0553
F +65.6552.0483

Taiwan
10F-2, 205 Tun Hwa North Road
Taipei 105, Taiwan
T +8862.2546.2223
F +8862.2546.1223

Australia
Autodesk Australia Pty Ltd.
Level 5 - Building C
11 Talavera Road
North Ryde, NSW 2113 Australia
T 61.2.9844.8000
F 61.2.9844.8044