Autodesk Film Solutions

Digital Entertainment Creation

9. Image courtesy of Universal Studios Licensing LLLP.

Since the inception of cinema, filmmakers have strived to tell stories in the most compelling manner possible, and technology has always had a significant role to play.

Today, new digital processes from digital intermediate (DI) to virtual moviemaking are transforming the way filmmakers and their teams create high-quality movie entertainment. More and more studios are releasing animated and live-action feature films in stereoscopic 3D (S3D) format. Autodesk technology is designed to help make these new processes a more immersive experience for the filmmaker.

These developments require increased collaboration throughout the moviemaking process, from art direction to final color grade. That's why Autodesk offers a comprehensive collection of collaborative, interactive, and stereo-capable digital entertainment creation tools that help artists to work in parallel, to experiment freely, and to make—or change—decisions when it matters.

Creating Stunning CG Content
Autodesk® Maya® software has been at the forefront of computer graphics (CG) use in the film industry since its launch over a decade ago and is a core component to the production pipelines of many award-winning visual

effects studios the world over. With its powerful, highly extensible feature set, Maya is suited to help with the more complex modeling, animation, effects, and rendering tasks required by film projects. In addition, Autodesk® Softimage® software and Autodesk® 3ds Max® software offer comprehensive CG toolsets that, depending on your pipeline and production requirements, make them a great choice to use either by themselves or alongside Maya.

Autodesk also offers specialized CG applications to help expand your creative capability and increase production efficiency:
- Autodesk® MotionBuilder® software provides a real-time, 3D interactive environment and outstanding nonlinear character animation tools. It is an ideal choice for animation-intensive productions, pre-visualization, performance animation, and director-driven virtual cinematography.
- Autodesk® Mudbox™ software offers modelers and texture artists the ability to quickly and intuitively sculpt and paint highly-detailed models, and to experiment non-destructively.

And, for even more value for money, you can get these applications as part of the Autodesk® Entertainment Creation Suite with either Maya or 3ds Max.

Compositing: Putting it All Together
It's virtually impossible to get everything needed for the final frame of a film in a single take or render. In most cases, tens or even hundreds of layers and passes go into the final image: actors need to be keyed from blue or green-screen, garbage needs to be rotoscoped out, reflections need to be added, removed or tweaked, set extensions need to be created, and the subtle interaction between layers needs to be iteratively refined to achieve the desired look. Maya, 3ds Max, and Softimage come with fully featured integrated compositing modules, helping facilitate rapid iterations, and helping reduce time-consuming round-tripping between 3D and 2D departments.

Whenever interactivity is of the essence, such as in a look-design session attended by a director, or a finishing session as the project approaches its final 'crunch' time, Autodesk® Flame® software provides the award-winning creative toolset that helps you to make instant changes, and experiment with multiple possibilities. From tracking to keying, color correction to motion estimation, advanced timeline editing to interactive 3D compositing, Flame offers a broad and rich toolset with great performance.

Grading and Finishing: The Final Polish

Film productions reach their full potential in the color grading process. Autodesk® Lustre® software is an Academy Award®-winning digital intermediate color-grading system. It enables colorists to shape color and lighting to establish narrative tone, realize creative intent, and help create stylized looks. Lustre provides a rich, creative toolset that can grade both standard and stereoscopic projects; offers collaborative project management tools; and integrates tightly into an Autodesk® Smoke® software or Flame workflow.

Often, audiences get to see footage graded with Lustre long before a movie is completed—in the form of the film trailers that are crucial to influencing theater-goers' decisions. These productions challenge their creators to grab viewers' attention and communicate the spirit of the movie with whatever footage happens to be available, often in an extremely short timeframe. That's a job ideally suited to Smoke—working at 2K and above, facilities can edit and conform at lightning speed, while concurrently grading in Lustre, and react to clients' feedback in real-time.

Workflow Media Management: Making your Pipeline Flow

It's a long and complex road from storyboard to screen, and data must travel through many tools along the way. Autodesk® FBX® technology is a widely used and supported platform-independent 3D data interchange solutions in the industry today—enabling geometry, animation, and textures to be efficiently exchanged between Maya, MotionBuilder, 3ds Max, Softimage, Flame, and certain third-party applications. And through its software

developer kit (SDK), FBX provides an open framework to integrate both Autodesk and certain proprietary tools into a custom pipeline.

Extensibility and interoperability are guiding principles at Autodesk. From extensive C++ APIs (application processing interfaces), to integrated Python™ scripting, to the Autodesk® Wiretap™ API, helping data flow smoothly through the production pipeline is always a priority.

District 9. © 2009 TriStar Pictures, Inc. All rights reserved. Image courtesy of Image Engine.

Solutions in Action

No matter what the project—a full-length animated feature, a fast-action trailer, the stereoscopic remake of a recent hit, a perfectly blended set extension, digital pyrotechnic effects or even just idea exploration through pre-visualization—Autodesk has a great combination of tools for the job.

Virtual Cinematography

As the borders between film and games become increasingly blurred, interactive technology has evolved to the point where directors can manipulate virtual cameras within textured and lit 3D environments, populated with highly detailed characters and props, in real time—or see their CG elements in the 'viewfinder', while working on the live-action set. This has led to a new style in filmmaking: virtual cinematography.

James Cameron and his production company, Lightstorm Entertainment, pioneered a new method for making visual effects movies with advanced virtual cinematography techniques. Using Autodesk Digital Entertainment Creation (DEC) tools, MotionBuilder and Maya, the team created a virtual stage or "volume" in which they could capture actors' performances and apply them directly to CG characters, while viewing the results in real-time. This unique soundstage gave Cameron the ability to direct a high quality CG performance as if it were live action. "Over the past few years, with the help of Autodesk software, we were able to bring [James Cameron's] vision to life. On set, we essentially created a live video game of each scene; we could see what the movie was going to look like and make adjustments right away, rather than waiting until post-production. This was in large part due to the powerful real-time interactive capabilities of MotionBuilder," says Nolan Murtha, digital effects supervisor at Lightstorm Entertainment. The movie sets a new standard in stereoscopic 3D (S3D) production, creating a compelling story that is told as much in 3-dimensional space as it is in time, drawing audiences deeper into the movie experience.

Stereoscopy

With stereoscopic 3D (S3D), filmmakers have another opportunity to offer audiences a differentiated, immersive experience that goes beyond what they can receive from their home entertainment system.

Stereoscopic productions introduce an entirely new set of challenges throughout the pipeline. With the ability to create, manipulate, and view stereo content in Maya, Flame, Smoke and Lustre, artists are able to make creative decisions within the context of what the audience will see—helping to eliminate guess work and resulting in a greater ability to use stereo as an aid to storytelling. And no one appreciates that better than Phil McNally, Global Stereo Supervisor at DreamWorks Animation SKG: *"Either on our own or in concert with Autodesk, we can develop tools in Maya that specifically address the challenges of stereoscopic 3D. Maya gives us the ability to see what we're doing in 3D —while we're doing it!"*

Fully Animated Feature Film

From the endearing cartoon-style characters of *Planet 51*, to the hyper-real performance animation of *Avatar*, Autodesk's film solutions are well suited to the task of creating the fully animated feature.

Once a storyline has been developed and characters designed, artists can begin modeling in Autodesk® Mudbox™ software—while technical directors (TDs) are developing powerful, reusable rigs; animators are roughing out animations and setting up cameras; and look developers are designing shaders and experimenting with lighting set-ups in Maya. The collaborative, nonlinear features in the tools help each team to refine their work iteratively to achieve the director's creative vision.

Maya and Mudbox proved to be the tools of choice at Starz Animation according to director of photography Kevin Adams, "As a creative tool, Maya is extremely fast and robust, and it enabled us to previsualize and complete very complex 3D animated sequences that involved compositing 2D matte paintings, 3D animated elements and choreography, and mapping 3D projections onto

surfaces, as well as camera moves, mist, explosions, and lighting effects. Maya was absolutely the best solution we could have used to create *9*".

Visual Effects

Only a decade or so ago some of the greatest stories on earth were confined to books. Today, however, any story can be told on film. From the epic battle scenes of *The Lord of the Rings* trilogy, to the universe of *Star Trek* and the USS Enterprise, directors and visual effects supervisors can ask their teams to create anything they can imagine, and then seamlessly bring together the live action actors, CG elements, and practical components into one hyper-realistic image.

"The reliability of the Inferno/SABRE system combined with the outstanding talent we have here virtually guarantees spectacular results. *Star Trek* was a magical combination of super powerful software and amazing talent," says Eddie Pasquarello, ILM's associate visual effects and compositing supervisor for *Star Trek*. According to animation director Paul Kavanagh, "using the hardware rendering tools of Maya, we were literally able to animate 70 shots in 5 days, a process that normally requires months for production."

Grading

Sometimes the nuances are so subtle that the audience doesn't even notice them—but the films that keep viewers most involved are the ones that have been cleverly and meticulously graded by a talented colorist: a character's face is ever so slightly highlighted; something about the faintly bluish tinge to the scene suggests the melancholy of impending dusk. Or sometimes the changes are dramatic —lights that were there when the scene was shot are removed, lights that weren't are added, and their effect on the rest of the scene is skillfully simulated. That's where Autodesk® Lustre® color grading software shines.

According to Joe Matza, chief executive officer of EFilm, "As part of the EWORKS system, Lustre allows our artists to work with tone and light, and to create environments to push the story along," he explains. "In the digital era, we're really fixated on picture quality. We love Lustre because it gives filmmakers the freedom to tell the story they want and gives EFilm the flexibility to evolve quickly with each new digital technology."

The Last Station. © Egoli Tossell Film, Zephyr Films. Image courtesy of CinePostproduction.

Trailers

Nothing influences theater-goers quite so much as a compelling trailer. And with many film previews now produced at 2K or above, facilities need real-time, creative tools to produce them. Not only do trailers have to be created before visual effects, final editing, and sometimes even principal shooting are complete, but they often have to be produced in multiple formats—with as few as two or three days to turn them around. That's a set of challenges that require some of the most efficient solutions in the marketplace.

The concurrent workflow between Smoke and Lustre helps maximize the time available for creative decision-making and refinement—making sure the audiences keep on coming.

Pre-Visualization

Filmmakers continually strive to tell stories in a better, more compelling way—experimenting with camera angles and shooting take after take to find the most appealing compositions within the frame. That's why more and more filmmakers today are pre-visualizing their scenes using 3D tools like MotionBuilder and Maya.

"We create most everything in Maya, and then we import all of those pieces into the MotionBuilder world," says Chris Edwards, chief executive officer from Third Floor Studios. "MotionBuilder is a fantastic tool in that it allows us to integrate live in the 3D environment. No other tools that we have seen out in the marketplace have that capability."

French Roast. © Pumpkin Factory, Bibo Films.

Previs is also a huge help in planning visual effects work and stunts, making sure there's less to be 'fixed in post' With the filmmaking process becoming increasingly nonlinear, it's also helping directors explore creative ideas and collaborate in refining their creative vision even after production has begun.

The Woman with a Broken Nose. © Neue Mediopolis Filmproduktion, Filmhouse Bas Celik. Image courtesy of CinePostproduction.

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—Nolan Murtha
  Digital Effects Supervisor
  Lightstorm Entertainment

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