

Autodesk's powerful tools gave us the opportunity to focus on the creative challenges of this scene rather than the technical ones.

—Geoffrey Hancock
Visual Effects Supervisor
CIS Vancouver

Autodesk® In Film

Digital Creative Immersion

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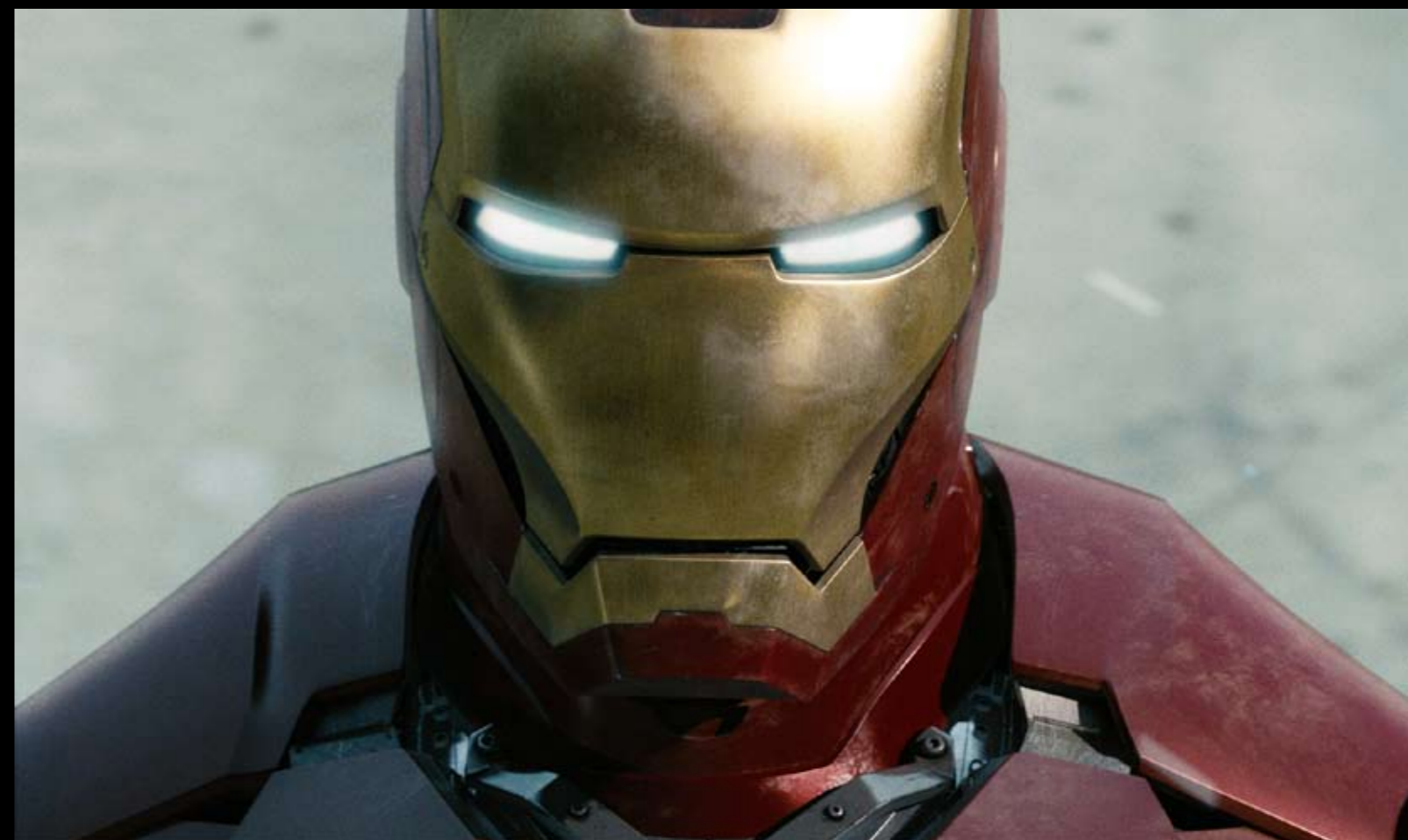
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Autodesk Film: Digital Creative Immersion

With traditional processes connected in new ways, everyone from directors to cinematographers, art directors, VFX supervisors, and artists can benefit from new and more efficient methods of sharing creative vision across the pipeline.

The filmmaker's century-old challenge of finding the best way to bring a story to the screen is not getting any easier; every year, competition increases, schedules and budgets shrink, and audience expectations grow. Production studios must find new ways to produce greater quantities of high-quality work while keeping at the forefront of evolving technology and attracting and retaining the best talent. That's why Autodesk offers collaborative, interactive, nonlinear toolsets that help artists to work in parallel, experiment freely, and make—or change—decisions when it matters.

Autodesk is uniquely positioned to offer one of the most comprehensive portfolio of film tools in the industry. We can help at numerous steps of the process: from pre-visualization (previz), and computer graphics (CG) production, to compositing, grading and finishing. Autodesk solutions help creative professionals to explore and realize their ideas.

3D Content Creation: Choose Your Passion Autodesk® Maya® software has been one of the products at the forefront of computer graphics use in the film industry since its launch—in fact, 27 of the 28 nominees of the Academy Award® for Best Visual Effects since 1999, used Maya extensively. With a broad feature set, Maya is ideally suited to help with the modeling, animation, effects and rendering tasks for film projects—and new toolsets in Maya offer support for stereoscopic productions.

But at Autodesk, we understand that personal preference and investment in learning are both extremely important to artists—and that's why both Autodesk® Softimage® software and Autodesk® 3ds Max® software are also part of the 3D portfolio for film. Both packages have their own unique features and attributes that, depending on your pipeline and the production, can make them the right choice.

Specific tasks often benefit from specialized applications that complement the core package. With a real-time, 3D interactive environment and outstanding non-linear character animation tools, Autodesk® MotionBuilder® software is an ideal choice for animation-intensive productions, previz, performance animation, and director-driven virtual cinematography. When it comes to character design, Autodesk® Mudbox™ software is an organic sculpting tool that offers modelers and texture artists the ability to quickly and intuitively create highly-detailed models, and to experiment non-destructively as they explore creative options.



Image courtesy of Cinesite and Walt Disney Pictures.

Compositing: Putting it All Together

Whether the final product is a fully animated feature or a live action film, with or without CG visual effects, it's virtually impossible to get everything needed for the final frame 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, and the subtle interaction between layers needs to be iteratively refined to achieve the desired look.

Autodesk® Toxik® software is a high-efficiency, high-dynamic-range (HDR) procedural compositing solution that can be the perfect companion to Maya. The flexibility to iterate at this stage of the production, while seeing the effect on the final frame, not only helps reduce time-consuming round-tripping between 3D and 2D departments, it enables the creative vision to be more thoroughly explored. Cameras and passes, even in stereoscopic productions, can be imported directly from Maya; the ability to import 3D geometry also helps facilitate the creation of set extensions.

Autodesk® Flame® software and Autodesk® Inferno® software give visual effects artists the interactivity and flexibility they require to tackle complex shots on time. Whenever interactivity is of the essence, such as in a look-design session attended by a director, or as the project approaches its final 'crunch' time, Flame and Inferno provide the creative toolset that helps you to make instant changes, and experiment with multiple possibilities. From tracking to keying,



This Way Up, image courtesy of Nexus Productions.

motion estimation to an interactive 3D compositing environment, Flame and Inferno offer a broad and rich toolset.

Grading and Finishing: The Final Polish

Film productions whether shot on film or captured or created digitally, reach their full potential in the color grading process. Autodesk® Lustre® software is a color grading system that enables colorists to shape color and lighting to establish narrative tone, realize creative intent, and create stylized looks. Lustre provides a rich, creative toolset that can grade both standard and stereoscopic projects, and integrates tightly into an Autodesk® Smoke® or Flame workflow.

Audiences often 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 compellingly 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



Changeling © 2008 Universal Pictures. All Rights Reserved. Images courtesy of CIS Vancouver.

Lustre, and react to clients' feedback in real-time. With its tree-based procedural compositing environment, multilayer timeline, and mixed-resolution interactivity, Smoke provides a unique solution for online editing and creative finishing.

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. Basing your pipeline on Autodesk tools, many of which have a high degree of data compatibility through their support for FBX, is the best way to achieve a nonlinear decision-making workflow.

Autodesk® FBX® technology is one of the most widely used and supported platform-independent data interchange solutions in the industry today—enabling geometry, animation and textures to be efficiently exchanged between Maya, MotionBuilder, 3ds Max, Softimage, Toxik, Flame, Inferno, and certain third-party applications supporting the FBX file format. And through its software developer kit (SDK), FBX provides an open framework to integrate both Autodesk and proprietary tools into a custom pipeline.



© 2008, 20th Century Fox, The Day the Earth Stood Still, Weta Digital.

Extensibility and interoperability are guiding principles at Autodesk. Through the extensive C++ application processing interface (API) in Maya, Toxik, MotionBuilder, Softimage, and plug-in APIs in Flame, Smoke, and Lustre; the integrated Python™ scripting in Maya, MotionBuilder, Softimage, and Toxik; or

the Autodesk® Wiretap™ API which enables interoperability between Flame, Inferno, Smoke, Lustre, Toxik, and certain third-party applications, allowing data to move easily from software to software through the production pipeline.

Autodesk Film: Solutions in Action

Fully-Animated Feature Film

From the endearing cartoon-style characters of *Kung-Fu Panda*, to the hyper-real performance animation of *Beowulf*, Autodesk's film solutions are ideally 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 gives us a lot of control over our particle simulations," says Scott Peterson, head of effects at DreamWorks for *Madagascar 2*. "The software is deep in terms of programmability and very scalable for all kinds of visual effects, from the down-and-dirty, two-day effect to the dam-breaking effect that took four months to perfect."

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 talking armored bear in *The Golden Compass*, directors and visual effects supervisors can ask their teams to create anything they can imagine, and Autodesk solutions are there to help them meet the challenge.

Then there's the matter of bringing together the components—from actors shot on green-screen, to practical elements, and of course the CG characters and environments.

"Maya played an important roll in our ability to bring *Iron Man* to life on the big screen," says Ben Snow, visual effects supervisor at Industrial Light & Magic. "Our animators enjoy the flexibility that Maya provides and I am particularly proud of the work they contributed to on this film. On the compositing front, as a key component of our Sabre system, Inferno allowed us to iterate on effects very quickly so our artists could concentrate their creativity on perfecting the shot rather than being distracted by the technology behind a particular effect."



Madagascar Escape 2 Africa™ & © 2008 DreamWorks Animation L.L.C. All Rights Reserved.

Stereoscopy

The evolution of high-quality digital technologies throughout the film pipeline and in theaters has provided filmmakers with a new opportunity to offer audiences a differentiated, immersive experience that goes beyond what they can receive from their home entertainment system: stereoscopic 3D.

Whether re-releasing old favorites in stereo, or creating new productions specifically designed to leverage the format, either alone or alongside the standard version, stereoscopic productions introduce an entirely new set of challenges. Autodesk has added stereoscopic toolsets in multiple places throughout the pipeline. With the ability to create, edit, and view stereo content in Maya, Toxik, 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!"

Grading

Sometimes the nuances are so subtle that the audience doesn't even notice them—but as top filmmakers know, the films that keep viewers most involved are the ones that have been cleverly and meticulously graded by a talented Lustre colorist: a character's face is ever so slightly highlighted to draw your attention to it while she speaks; something about the faintly bluish tinge to the scene suggests the melancholy of impending dusk, when it was actually shot at noon. 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 the power of color and where Autodesk Lustre shines.

According to Michael Cooper, EFilm vice president of business development, "As part of the EWORKS system, Lustre allows our artists to work with tone, light, and 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."

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 previs—Autodesk has a great combination of tools for the job.



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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.

Creating the film-before-the-film in record time is never going to be easy, but 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. But with the exponential increase of CG content in live action films, much of what will make up the final frame often simply doesn't exist during principal photography. That's why more and more



Delgo, Image courtesy of Fathom Studios.

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." 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.



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Virtual Cinematography

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. MotionBuilder helps maximize creative exploration, enabling directors to design and experiment with camera shots right in context. That’s exactly what happened for the production of the meadhall destruction scene in *Beowulf*, as Corey Turner, animation supervisor at Sony Pictures Imageworks, explains:

“The request was for a scene with from 10 to 100 characters inside the hall, all of whom needed to be edited to have the ability to shift their timing according to the director’s instructions. We didn’t know where the camera was going to go, but the director needed to view all the action in real time before dropping a camera in. We created a perspective camera [in MotionBuilder] which allowed the director a bird’s-eye view of the hall. At that point, he was able to adjust anything that didn’t work for his camera framing, and all of his camera layout was done in real time.”

Creativity First in your Film Pipeline

As we enter the second century of filmmaking, studios are faced with having to produce more high-caliber work, faster. Whether your team is looking to create a fully animated feature, an effects-packed adventure, a live-action epic, a stereoscopic thriller or a trailer for a movie still in production, you’ll benefit from the input of top film studios whose decades of experience have helped to shape the award-winning software packages Autodesk offers. And beyond the individual products, Autodesk can help you develop a pipeline that supports nonlinear decision-making, so that you can efficiently produce stories fit for a new era in filmmaking.



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