

SCRATCH speeds 'look development' and VFX workflow For *Underworld: Awakening* at Luma Pictures

The Facility: Luma Pictures, Santa Monica, California

Located just two short blocks from the wide Pacific Ocean in Santa Monica, Luma Pictures has a reputation for delivering world-class VFX on major motion pictures. Since its founding in 2002, the company's phenomenal team of artists has contributed to more than 60 features. Its most recent claims-to-fame include such blockbusters as *Thor*, *Captain America: The First Avenger*, *The Green Hornet*, *Harry Potter And The Half-Blood Prince*, *Pirates Of The Caribbean: At World's End*, plus all four films in the *Underworld* series.

Additionally, Luma is often the go-to place for the Coen Brothers, having worked on four of their films including *True Grit* and *No Country For Old Men*, which won the Oscar for Best Picture in 2007.

Luma Pictures has the resources and experience to take on any challenge, regardless of its size, scope, nature or degree of difficulty. Its output encompasses virtually every category of VFX – from photoreal creature animation to complex digital environments and sets. Underpinning this success is a philosophy that sees the creative team collaborating together in a continual iterative process, as VFX supervisor Vince Cirelli explains.

"We're an artist-owned, artist-run facility. It's a very human place to work, with a flat hierarchy, little red tape, and where ideas get heard. The artists here have specialist talents, and generalist skills. For example, most of our composers can light, and most of our lighters can composite.

"Our approach is all about the evolution of the shot; about how we, as artists, pull together from the creative concept to final delivery to the client. Often in VFX production, shots move in serial and in batches from one department to another. We buck the trend and run our animation, lighting and compositing processes in parallel. We don't wait for finalised assets, but have a concurrent asset build for the duration of the show. It's a constant iterative process of 'look development'. It's the only way to hit the quality we want to produce. Working this way mean we have to feel completely confident with our pipeline, to have the ability to continually review and compare shots, and SCRATCH is absolutely at the heart of this paradigm."



Underworld: Awakening: image courtesy of Luma Pictures

Project Leader: Vincent Cirelli, VFX Supervisor

Vince Cirelli leads the artistic and technical execution of each project at Luma Pictures, and has more than 40 features to his credit. Prior to joining the company in 2004, he was an award-winning creative director, working on interactive advertising campaigns for Fortune 500 companies such as Coca-Cola, General Mills, Hasbro, Target, Toyota, the US Army and United Airlines. He then worked at Stan Winston Digital as the technical director on *Sky Captain And The World Of Tomorrow* and *Fantastic Four*.

“I like to be hands-on, and during my time in adverting, and then with Stan Winston, I became very familiar with all aspects of CG, animation, lighting rendering, and compositing,” he says. “I also learned the fundamental basic that, to be both creatively and commercially successful, you have to leverage software and hardware into a fast and effective pipeline.”

SCRATCH was added to the pipeline at Luma when the existing review and grading toolkit didn't quite hit the mark.

“We were working with one of the more expensive playback/DI systems, on *X-Men Origins: Wolverine*, but it just didn't plug into the pipeline, and the workflow was slow and frustrating,” explains Cirelli. “A producer friend at Digital Domain showed me SCRATCH, and I realized at once just how fast and extensible it is. So we dumped the other system, and completed our work by grading over 100 VFX shots, in SCRATCH. I became a huge fan of SCRATCH, and we've been using it ever since.”

“I have to say that while SCRATCH is an excellent grading system, helping us to deliver color-consistent VFX shots, it plays a crucial role as a ‘look development’ tool.”

The Project: *Underworld: Awakening*

Lakeshore Entertainment's vampire/werewolf *Underworld* franchise, which began in 2003, has now opened its fourth



chapter with *Underworld: Awakening in 3D*. Directed by Mans Marilind and Björn Stein, it is one of the first movies to be shot using RED Epic digital cameras.

The *Underworld* franchise has garnered die-hard fanatics, not least because Kate Beckinsale plays the svelte, ass-kicking vampire warrioress Selene, who is hell-bent on destroying Lycans – werewolves who are able to shift between human and lupine form. Each installment in the series has been visually striking and unapologetically violent, and this formula has proven successful at the box office. The first three features – *Underworld*, *Underworld: Evolution*, and *Underworld: Rise of The Lycans* – have taken just under \$300m worldwide.

The challenge: ‘look development’ on close-up creatures
Luma Pictures was charged with delivering 105 VFX shots for

Underworld: The Awakening, having to develop two types of creatures, blend actors with digital doubles and create transformations between characters. However, Cirelli says the task was made tougher in two particular respects.

“Normally shows will have a range of long and mid-shots with a few close-ups peppered throughout, but on this show the action was very close to the camera on almost every shot. Our major challenges were to figure out how to establish the look, how the surface properties of the characters would work in these shots, and getting a seamless composite of the live action and CG assets. We wanted to avoid having to continually refine looks by rendering in CG, or tweaking them in Nuke, as this is error-prone and time-consuming. And that's where SCRATCH came in.”

The solution: SCRATCH

Luma's SCRATCH feeds 2K footage in real-time to either a 10-bit monitor in Cirelli's office, or the company's digital screening theatre, where artists, supervisors and clients gather frequently to review work-in-progress. All screens are carefully calibrated to ensure color precision.

SCRATCH's CONstruct module is one of the cornerstones of Luma's approach to 'look development'. It's used to manage ongoing EDLs coming in from editorial, and it allows shots published by a compositor or CG artist to be automatically inserted into a review timeline. Cirelli also uses the CONstruct to group shots into different types - such as shots with similar camera angles or similar tonal ranges.

"The CONstruct allows us to view shots back-to-back - such as QTs, RED R3D files, or 2K DPXs. Our artists can see how one shot plays with another in terms of lighting or continuity, and compare their latest work against a hero image."

SCRATCH's grading and Scaffolds multi-layering capabilities are the other bedrocks that support the process at Luma. "We can bring in a high-resolution background plate, pull a key to overlay



a CG asset, reposition it, apply tracking masks to different areas that need treatment, and then separately dial-in grades to adjust highlights, shadows and black areas - all to make a shot

look more pleasing," he says. "From here we then quickly render out an image sequence as a beauty reference for the CG team to match to. Making refinements and iterations quickly in SCRATCH, rather than slowly in CG, is highly advantageous to the workflow. We can greatly increase the iterations on a project while significantly reducing artist's time spent on honing looks from beginning to end."

"While SCRATCH is an excellent grading system, helping us to deliver color-consistent VFX shots, it also plays a crucial role as a 'look development' tool."

And these were the foundations of the pipeline on *Underworld: The Awakening*. Cirelli started the project by importing concept art and raw CG renders into SCRATCH for the creative team, and then over time, employed SCRATCH as the hub for reviews of the evolving animation, lighting and composites, continually bounce results back and forth.

"SCRATCH also allowed us to adjust the composition of shots," he says. "For example, one of the characters, a 14ft Über werewolf, moves around the set and comes very close to the camera. As we were working with 2.5K DPX files in SCRATCH, we could blow-up or reposition the background plate or CG character. We could also finesse the depth-of-field, and then set the character in the scene by adjusting color and contrast values."

As for handling 3D stereo, Cirelli says it was a real advantage to be able to play back converged stereo imagery in real-time in SCRATCH, and praises SCRATCH's tracking, keying and paint capabilities for helping to fix L&R eye discrepancies - such as highlights - that might make for an uncomfortable viewing experience.

Color consistency is an important aspect of Luma's work, and Cirelli is hugely excited by the future impact of SCRATCH2Nuke, ASSIMILATE's free-of-charge example XML scripts that leverages SCRATCH's XML interface to allow fluid workflows between SCRATCH and Nuke for more streamlined VFX post production.

"Due to the prevalence of on-set systems, it's become more and more common for clients to want see a graded product from day one of the shoot. But quite often, we don't get details of that grading information, or the LUT that was used. Or we'll be referencing color from a compressed QT that has been tweaked in editorial. Eye-matching in Nuke can equate to an incredible amount of time," he says.

"SCRATCH2Nuke is a dramatic advance for color consistency in VFX post, as the color information is bottled-at-source. Once a sequence is graded in SCRATCH, it can be automatically exported to Nuke, with the color information, as a Nuke color node. This means Nuke compositors no longer have to worry about match-grading again."

But he also sees SCRATCH2Nuke having fundamental ramifications when designing a character and its properties. "Before now, compositing artists would have to refer to a snapshot and try to replicate that. Now we can hone and finesse a character from the start in SCRATCH - by adjusting the color, luminance, contrast, etc - and just write that data out to Nuke. It will have a major impact here."

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