Previsualizing "The One"

In the heart-pounding fight scenes in the action film "The One," character Jet Li stops bullets, transcends time and gravity, and gives himself a real thrashing. But before Jet was on the set performing action-packed moves, he existed in the alternate universe of David Allen's Macintosh as a 3D animation. David Allen's company, TeamWorks Digital, used Apple technology to help Revolution Studios plan and produce the amazing fight scenes in this exciting new movie, "The One."

See the Shot

Allen's job was to create models of the movie's shots on his Macintosh. These 3D scenes, usually called previsualizations (previs), help the director, the cinematographer, and the actors see how a final shot will look. The model scenes that Allen creates play a large role in guiding the layout, timing, lighting, and camerawork of a shot.

> "I look forward to switching to Mac OS X because a lot of programs will be even more usable and faster on the UNIX-based architecture."
>
> — David Allen, 3D Animator

Allen uses the Mac platform for previsualization because everything integrates easily. "Macs are truly plug and play," he expresses. For instance, his team used a Canon GL1 camcorder to both record rough scenes and to view model scenes created on the Macintosh. With Macintosh FireWire connectivity, "we could plug the camera in and scenes would pop up with no problems," he enthusiastically explains.

The previsualization process starts with in-depth research. Allen collects all available information about a shot and imports it into his Mac. "I use everything from storyboards to notes written on napkins," he explains. He usually starts by scanning in the blueprints of the set, which are then converted to a 3D model of the real thing.

Modeling the Characters

Because the character interaction is so complicated in "The One," Allen used an animation program called Poser to build and animate the models of the actors. Poser offers a library of pre-built, realistic-looking characters that are already jointed and ready to animate. These characters can be animated using inverse kinematics — the user can select and "drag" one body part, like a hand, and the rest of the arm follows with natural motion.

David Allen (right) with Eric Durst, the Visual Effects Supervisor.

Gear Check

- Power Mac G4 dual processor
- Final Cut Pro
- LightWave 3D by NewTek
- Poser by Curious Labs
- Poser Pro Pack by Curious Labs
- Canon GL1 DV Camcorder

See the movie trailer for The One.

TEAMWORKS DIGITAL
(310) 991-5442
www.teamworksdigital.com

As a pair of bullets speed towards Yulaw (Jet Li), he quickly avoids the first and deflects the second into the glass. Art department provided blueprints of the MRI room. Previs then modeled the scene and created the shot. This established the positioning of Yulaw in the scene for use of a track guided camera rig.
See Bulletcam Previsualization.

Allen worked from a photo of Jet Li to build his character, striving to match skin tones, hair color, and movement style. He then built multiple copies of Jet Li wearing different costumes. "Because we were using a fast dual processor Power Mac G4, we could change Li's clothing color in real-time to show the director," Allen says.

Allen worked with a beta version of the now-released Poser Pro Pack, which allowed him to integrate Poser animations seamlessly into his main modeling program, LightWave. Whenever Allen made a change to an animation in Poser, it would automatically propagate to LightWave. "The Pro Pack was one of three beta programs we were using," Allen explains, "Only on the Macintosh could we produce this intense project while beta-testing at the same time."

Using a couple of guys from Jet's martial arts team, previs established a "look" for the transition of power and speed between the two characters.

Once the character animations were completed in Poser, Allen imported them into LightWave for more complete modeling of the scene. One reason Allen uses LightWave on a Mac is for its ability to complete rendering quickly. LightWave has the ability to render at different levels of resolution, from an unshaded wireframe to a complete, smooth-shaded model. Because Allen's dual processor Power Mac G4 system handled renders and other graphic-intensive processes very quickly, he was able to render multiple versions of a shot on the set so the director could see desired changes immediately.

Timing is Everything

Allen praises LightWave for its high level of creative control. "LightWave enables the user to define many details of the scene, from lighting to timing. Because the fight scenes in 'The One' were so complex, often involving frozen or sped-up motion, timing was crucial." Allen used LightWave to put together the fight scenes with accurate timing and multiple characters, drawing on the animations created in Poser. He could then adjust the timing in real-time on the set as necessary. "The processing speed of the Power Mac G4 made it possible to perform many timing changes right there with the director — something we could never do with other systems," Allen says.

About TeamWorks Digital

Long before the cameras roll, before the actors walk onto the set,before the set even exists, there is previsualization.

Blueprints and script pages and vague ideas discussed over coffee -- all of these elements are combined by TeamWorks Digital to create virtual sets, virtual actors and virtual shots in the computer.

Along with storyboards, previsualization helps to express a director's vision for a single shot or a full sequence. Previsualization goes a step further and proves the logistics of the shot.

Producers can budget based on it, directors can easily convey their vision using it, editors can cut it in as a placeholder until the final effects are complete.

Some of our most recent work can be seen in ***The One*** starring Jet Li currently in theatres. Other recent credits include features such as ***My Favorite Martian*** and ***Dude, Where's My Car?***

TEAMWORKS DIGITAL
(310) 991-5442
www.teamworksdigital.com

On Location — An Instant Office
The crew of The One set up a temporary office for Allen on location. He lauded the Mac for its ability to set up instantly and integrate with other hardware components without hassles. He and the visual effects supervisor Eric Durst both used a dual processor Power Mac G4, networked together, in addition to a wide range of printers, scanners, slide scanners, and digital video cameras. "All we had to do was set down the Ethernet hub, plug in the DSL line and our two Macs, and we were ready to go," explains Allen. When the supervisor wasn't using his computer, Allen set up the Macintosh systems to handle a network render, making his modeling work even more efficient.

> "The Mac sells you as being forward-thinking and artistic."
>
> — David Allen, Animator for TeamWorks Digital

Yet another critical Apple technology in Allen's work is QuickTime. "QuickTime is the standard video format; anybody can play it," says Allen. It was crucial that the art department, visual-effects house, and camera-rig house all had access to the previsualized shots. Because LightWave can render scenes as QuickTime files, it was easy for Allen to e-mail them, export them to tape from Final Cut Pro, or put them on the Web. For large file downloads, he set up an FTP site using the Mac's simple Personal Web Sharing command.

Coming Attractions
"The next step for us is to get a Titanium PowerBook G4 so we can be completely mobile," says Allen. Because many films shoot at multiple locations, the portability of the PowerBook G4 is a huge timesaver. The large, bright screen is also incredibly beneficial while showing the director and other crew members the previsualized scenes.

The 22-inch Apple Cinema Display is also on Allen's wish list. "The Mac sells you as being forward-thinking and artistic," he says. "With the display's widescreen aspect ratio, Apple shows they are sensitive to the needs of filmmakers." Allen could also use the portability of the flat-screen Apple Display. Oftentimes, he has to store his equipment in a secure location.

Allen sees the Mac continuing to reign as the leading platform for previsualization and other video work, especially with the move to Mac OS X. "I look forward to switching to Mac OS X because a lot of programs will be even more usable and faster on the Unix-based architecture," Allen says. "With OpenGL, QuickTime, and other graphics technologies built into the operating system, the guts of OS X are deeply rooted in integrated 2D and 3D technologies. In other operation systems, these technologies are often just add-ons."

Allen attributes built-in FireWire, excellent real-time performance with few stability problems, and fast graphics processing as examples of how Apple "gets the needs of 'creatives'" while also being dedicated to making video and other creative media fast and usable. "Many times, the production team will throw things at you that you don't expect — from audio to special camera shots or props," he says. "The Mac allows you to say 'yes' more often." He feels he can rely on the Macintosh platform to handle any new creative technologies needed for high-tech films like "The One."

James Wong, the director, had a specific "look" for the deformation and reformation of the characters as they travelled through the Quantum Tunneler.

Previsualization helped to determine the position, speed and movement of the characters in the factory fight scene. Ultimately, Jet was photographed twice, once as Gabe and once as Yulaw, using a cable rig and speed controlled cameras, and then composited together in post.

View this article online at Apple Computer's website for creative professionals:

www.apple.com/creative/video

TEAMWORKS DIGITAL
(310) 991-5442
www.teamworksdigital.com