What's So Hot About Nuke?

By Steve Wright

Nuke is emerging as the compositing software of choice for VFX facilities that want to move up to the next level in their compositing departments for both visual quality and production efficiency. Its unique management of floating point colorspace coupled with its novel multi-channel architecture and superb 3D support make it the most effective compositing tool for any CGI production pipeline. Any digital artist that wants to stay on the leading edge of VFX compositing needs to learn Nuke.

Nuke was developed at Digital Domain, one of Hollywood's top visual effects facilities, for their own internal use so it has been forged in the fiery furnace of very serious feature film VFX production. It was purpose-built to be the back end of a major CGI production pipeline and has a long list of unique features that put it in a class by itself.

Originally offered for sale directly by Digital Domain, it was quickly discovered that the sales and support of a major software product like this was a different business requiring the expertise of top specialists. They have since handed sales and support to The Foundry, famous for their powerful image processing plug-in software that enhances the capabilities of Flame, Shake, After Effects, and many others. Now that Nuke sales and support is in the capable hands of The Foundry with a presence in Los Angeles, the VFX production industry is much more comfortable about committing to Nuke. Here is a brief summary of Nuke's key features that have impressed me so much.

Multi-Pass EXR Files

Today's CGI is rendered as many separate layers, or "passes", that are then blended together during compositing to achieve the final look. Some of the more common passes are color, ambient, diffuse, reflection, fresnel, grunge, occlusion, shadow, and many, many more. There can be anywhere from 10 to 30 such passes in a typical CGI object such as a robot or dinosaur. Managing all of these as separate files for every frame is a very messy business. With Nuke, the CGI department can render all of these passes into a single file for each frame using ILM's powerful EXR file format. This provides a much simplified production pipeline and introduces great efficiencies.

True 3D Environment
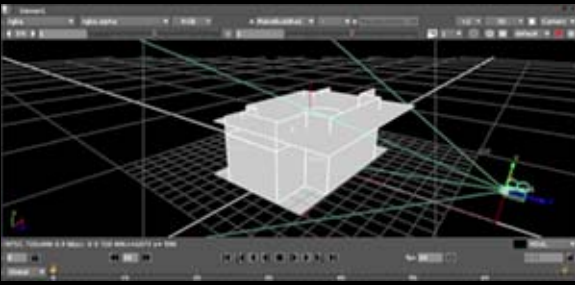
Nuke actually contains a true 3D environment normally only found in extremely expensive systems like Flame. Geometric primitives can be created, texture mapped with images, then re-photographed by the system's 3D cameras. Nuke is optimized for doing set extensions and camera projection shots, standard fare of the VFX industry. While not a 3D modeling program itself, complex 3D objects can be modeled in true 3D programs such as Maya then imported into Nuke for lighting, mixing with live action, and rendering with imported camera tracking data. This allows many complex and expensive 3D tasks to be transferred to the faster and more cost-effective 2D department, a powerful new trend in VFX production.

Unmatched Visual Quality

Because Nuke was born and bred in the high-end feature film production world it has unmatched quality in both its image processing computations and its many features and functions. Many programs such as Shake have the option to "promote" 8 bit images to 16 bits or even floating point to protect them from artifacts during compositing. But Nuke goes all the way. It automatically promotes all images to an incredible 32 bit floating point format without the usual speed penalty associated with working in float. In addition to that, its other features such as the motion tracker and motion blur calculations are of superb quality. Of course, Nuke still brilliantly performs classic 2D compositing functions such as bluescreen and greenscreen keying with both Primatte and their own amazing IBK Keyer.

Stereoscopic Workflow

The introduction of Digital Cinema to movie theatres has suddenly made stereoscopic 3D movies much more practical which has already resulted in a major up-tik in their production. Using conventional 35mm film, 3D movies are difficult and expensive to produce and project. They require two synchronized film projectors in the projection booth loaded with two different reels of film. However, today's digital projectors can project the left and right eye images simultaneously from a single file and do it with more sharpness and brightness than film. This has made single-projector 3D movies a practical reality. Nuke has anticipated this future trend and has incorporated a true stereoscopic workflow that makes working on 3D movies *almost* as easy as flat ones.

Nuke did not stop at just being the top professional VFX compositing program. It goes all the way and incorporates the grand vision of the entire CGI production pipeline. It is this top-down "big picture" design philosophy that makes Nuke the stand-out choice for all VFX facilities that want to upgrade their CGI pipeline to take advantage of Nuke's unparalleled visual quality and improved production efficiency.

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