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DreamWorks Animation Announces Deep Compositing Extensions (DCX) Open Source Project

Glendale, Calif. – July 21, 2016 – DreamWorks Animation (Nasdaq: DWA) today announced their Deep Compositing Extensions are available as an open source project, OpenDCX (opendcx.org). The technology developed by engineers Jonathan Egstad, and Mark Davis was enthusiastically received at the 2015 Digital Production Symposium (dp2015.digiproconf.org), and DreamWorks is pleased to respond with this open source effort to encourage industry adoption of the technique.

DreamWorks Deep Compositing Extensions allow anti-aliased compositing of OpenEXR (openexr.com) deep image files with a mixture of solid and volumetric elements, while keeping the memory requirements to a minimum. The addition of subpixel masks to each sample allows for coverage and opacity to be treated separately, without an excessive increase in memory consumption, and with the use of the new “hard surface” flag, the included flattening algorithm allows for any combination of volumetric and solid elements to be merged with plausible anti-aliasing. Furthermore, the extensions provide the ability to apply affine image-space transforms to the deep image data, taking advantage of the sub-pixel information within each sample. Finally, a sub-pixel accurate pixel filtering method is provided to allow higher quality image reconstruction.

“FX at DreamWorks has utilized deep images for many years; however, Kung Fu Panda 3 was the first feature where Lighting fully embraced the technology. Previously, deep pixel information proved problematic in reconciling high-frequency features like hair and fur with intersecting hard-surface geometry, and flattening a deep image did not produce the same image as a full render,” said Jeff Budsberg, Head of FX on Croods 2. “With deep subpixel masks, an efficient EXR channel encoding, and a custom deep image flattener, the DCX technology yields a production-friendly solution for full deep compositing that resolves previous visual artifacts, while only requiring a small increase in disk footprint.”

“Adding subpixel Mask support allowed us to jump between a deep image workflow and the old workflow without a noticeable loss of image quality.” said Matt Titus, FX Lead on Kung Fu Panda 3.

"Our digital production requirements continue to drive industry-leading innovation in our technology," said Andrew Pearce, Director of Technical Strategies at DreamWorks Animation. “We are honored by the recognition of the technique, and pleased to continue to work with industry to extend our collective capabilities.”

OpenDCX is available immediately at opendcx.org.”

Full use of the technology requires simultaneous changes to all three of a studio’s renderer, compositor, and file format. To that end the open source package contains reference implementations for those three components;

- 1) Pseudo-code for Renderers, as written for DreamWorks Animations’ Moonlight renderer, and substantially implemented in Houdini’s Mantra renderer (SideFX.com)
- 2) Nuke (thefoundry.co.uk) plug-ins to execute deep compositing extensions
- 3) OpenEXR (openexr.com) extension to support the modified deep image format as a separate layer that sits on top of the file format, supplying the logic to interpret the OpenEXR channel data.

If community feedback is positive, DreamWorks will work with OpenEXR to find a suitable implementation and then lobby for full inclusion in the OpenEXR standard.

About DreamWorks Animation

DreamWorks Animation (Nasdaq: DWA) is a global family entertainment company with business interests that span feature film and television production; licensing and consumer products; location-based entertainment; and new media properties, including the Company’s controlling interest in AwesomenessTV. The Company’s feature film heritage includes many of the world’s most-beloved characters and franchises, including Shrek, Madagascar, Kung Fu Panda and How to Train Your Dragon, while its 32 feature film releases have amassed more than \$13 billion in global box office receipts. DWA’s television business has quickly become one of the world’s leading suppliers of high-quality family programming, reaching consumers on linear and on-demand platforms in more than 130 countries and winning a total of 30 Emmy™ Awards to date. The Company’s deep portfolio of intellectual property is supported by a robust, worldwide consumer products practice, which includes licensing, and location-based entertainment venues around the world. The Company is also the majority owner of AwesomenessTV, a leading video destination for Generation Z and Millennial audiences, and also owns 45% of Oriental DreamWorks, a world-class animation studio in China that produces family entertainment for both Chinese and global audiences.

About Foundry

The Foundry is a leading global developer of creative software used to deliver high-end visual effects and 3D content for the design, visualization and entertainment industries. The portfolio empowers artists to create inspiring and technical images and

visual experiences in media production (film, commercials, episodic television, gaming, and virtual and augmented reality), and product and industrial design.

The company was founded in 1996 and is headquartered in London, with offices in Silicon Valley, Manchester, Los Angeles, Shanghai, Dublin and Austin. In November 2015 Alex Mahon was appointed as CEO. Clients include Pixar, Mercedes-Benz, ILM, Double Negative, The Moving Picture Company, Walt Disney Animation, Weta Digital, Framestore, Sony Pictures Imageworks and Skullcandy. In 2015, the London Stock Exchange named The Foundry one of its “1000 Companies to Inspire Britain.”

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About SideFX

Established in 1987, SideFX is a world leader in the development of advanced 3D animation and visual effects software – including Houdini – for use in film, commercials and video games. The Houdini family of software offers digital artists an unprecedented level of power, flexibility and control based on award-winning procedural technology. The comprehensive feature set includes modeling, texturing, rigging, animation, particle effects, physical simulation, crowd dynamics, lighting, integrated rendering, compositing, and more.

About OpenEXR

OpenEXR is a high dynamic-range (HDR) image file format originally developed by Industrial Light & Magic (ILM) for use in computer imaging applications. Since the format’s release as an open standard in 2003, OpenEXR has seen widespread industry adoption and support. The file format has been maintained and expanded by a number of key industry leaders including ILM, Weta Digital, Pixar Animation Studios, Autodesk, DreamWorks Animation, and others.

OpenEXR has become the industry standard for storing and working with high dynamic-range imagery. The format has been used on hundreds of feature films since its introduction in 1999 and is supported in the majority of image creation software packages available today. More information can be found at the OpenEXR website at <http://www.openexr.com>.

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