Intel Rendering Framework and Intel Xe architecture poised to advance studio workflows

by Hilbert Hagedoorn on: 05/01/2019 10:00 AM | source: | 4 comment(s)

Xe architecture roadmap for data center optimized rendering includes ray tracing hardware acceleration support for the Intel Rendering Framework family of API's and libraries.

-- Intel --

Intel Rendering Framework and Intel X^{e} architecture poised to advance studio workflows

By Jim Jeffers | May 1, 2019

As the world's visually creative leaders come together at FMX'19 in Stuttgart this week, I would like to share some exciting news regarding Intel and its partners' efforts to continue delivering leadership solutions for advanced, feature rich, photorealistic and high-performance workflows for studio quality asset creation. As I announced in my SIGGRAPH'18 blog, Intel® Rendering Framework open source software libraries continue to increase in features, performance and ease of use.

Intel® Embree, Intel® OSPRay, Intel® OpenSWR, and the recently released Intel® Open Image Denoise provide open source rendering kernels and middleware mapped to Intel® architecture multi-core parallel processors for maximum flexibility, performance and technical transparency. Intel® Xeon® processors running Embree supported renderers are used to provide state-of-the-art visual effects in animated movies, including Dreamworks* MoonRay* renderer, used to render *How to Train Your Dragon: The Hidden World* that is in theatres now.

For complex shading methods, Intel has been collaborating with Pixar and Sony Imageworks to increase performance of shading processes that use Open Shading Language (OSL). By tapping the parallelism of Intel® Xeon® processors with Intel® AVX2 and AVX-512 vector instructions, as much as 2x shading performance improvements have been seen on Pixar scenes. Look for Pixar's Dylan Sisson's FMX talk for more on this topic.

Intel recently launched the 2nd Generation of Intel Xeon Scalable processors that include Deep Learning Boost® instructions adding new levels of performance for Artificial Intelligence (AI) methods. This capability creates opportunities for increased realism and faster asset turnaround for film creators like Ziva Dynamics, who use AI and Intel® Xeon® processors to deliver realistic character behaviors such as the prehistoric shark in 2018 film, *The Meg* from Warner Brothers Studios.

USD Hydra OSPRay Plug-in and Intel® Open Volume Kernel Library

As the cornerstone of our professional rendering platform, the Intel® Rendering Framework keeps evolving to accelerate your workflows, today. We recently released the first version of our open source Universal Scene Description* (USD) Hydra OSPRay Plug-in to enable interactive, up to real-time, photorealistic, global illuminated previews in Hydra capable application viewing windows (e.g. AutoDesk* Maya*). This plug-in takes advantage of all the benefits Intel® OSPRay with Intel® Open Image Denoise brings to applications, including the ability to interactively render very large-scale data (100's of gigabytes to many terabytes) and allows scaling with multiple server nodes to increase frame rate, visual quality, and 3D dataset sizes including multi-frame animations.

We continue to work with industry partners like Disney Animation* and Pixar* to improve the breadth and quality for production uses of USD Hydra. We have been jointly testing a preliminary but still incomplete version (e.g. the ocean portion) of the Moana Island Scene. Our goal is to drive increased functionality into both USD and Intel® OSPRay as these projects continue to strive for highest quality and performance for studio asset exchange.

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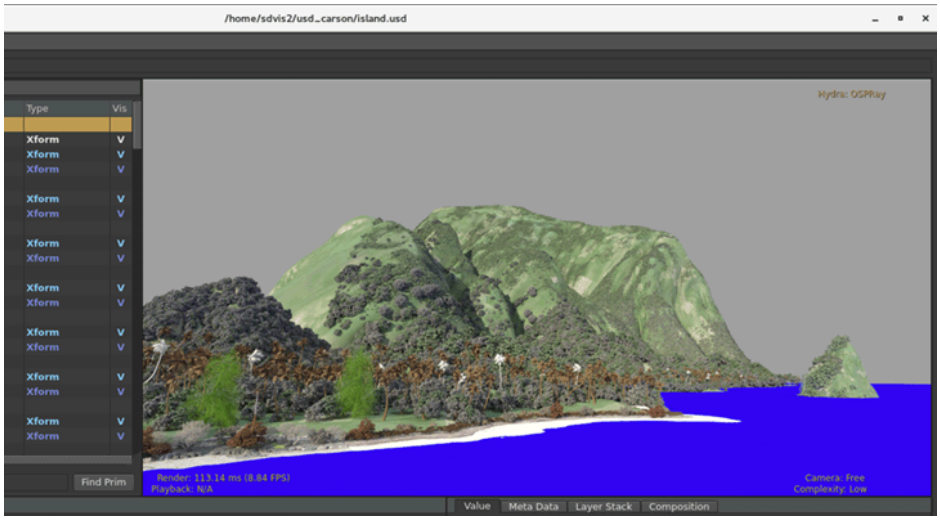
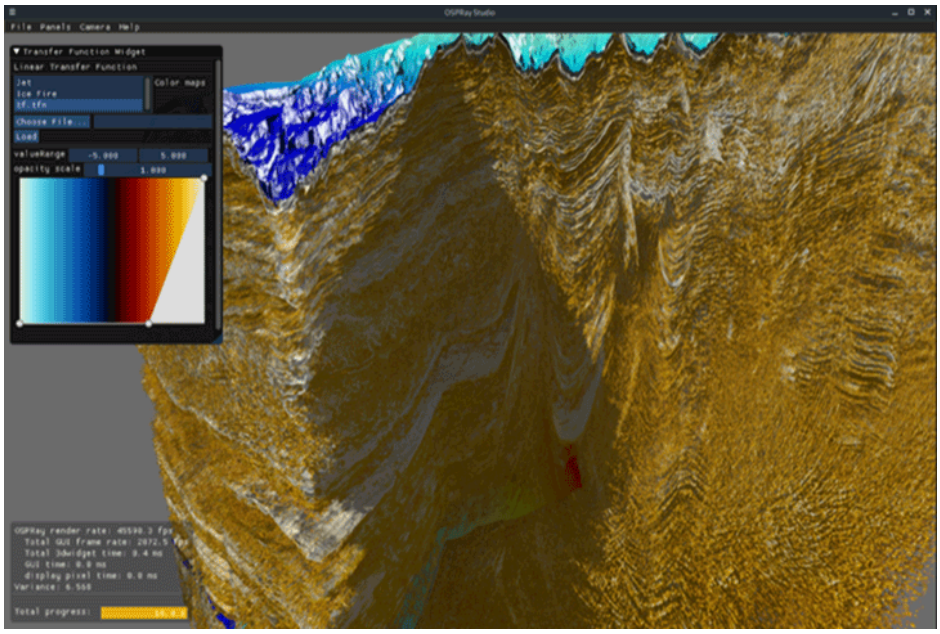


Preliminary 'Work in Progress' USD version of Moana Island Scene: Courtesy Walt Disney Animation Studios

Finally, I am very pleased to announce the fifth open source library being added to Intel® Rendering Framework, The Intel® Open Volume Kernel Library (Intel® OpenVKL). Since Intel® OSPRay rendering infrastructure's first release in 2015, one of its significant strengths has been its broad support for a variety of structured and unstructured volume formats with interactive to real-time performance on Intel processor platforms. Volume rendering is a critical capability for scientific visualization of simulations of everything from gravitational cosmology, weather, geology, and more. For digital content creation and special effects, it enables delivering a truly realistic world by enabling key visual effects like explosions, clouds, water flow, and more.



Screen Capture of OSPRay Studio application rendering the Moroccan Ocean Shelf with Intel® OSPRay and Intel® OpenVKL. Note the unique use of global illumination (shadows and ambient occlusion). Data courtesy of the Bureau of Economic Geology at The University of Texas at Austin and the Moroccan National Office of Hydrocarbon and Mining.

To bring more flexibility, performance and efficiency to volume-based use cases, we are taking the core Intel® OSPRay volume processing algorithms, extending and packaging them for use in a form similar to the Intel® Embree kernel ray tracing library. This will allow renderers and even simulation codes efficient, direct interfaces to efficiently process volume data in its many forms. Intel® OpenVKL's first release will be in Q3 2019 and Intel® OSPRay will be reformed to use OpenVKL as the kernel library for volume processing. As a Premier Member of the Academy Software Foundation (ASWF) we are participating in the OpenVDB project and planning OpenVDB support in a subsequent OpenVKL release targeting end of 2019 or early 2020. Look for more info and the release of Intel® OpenVKL at www.openvkl.org

Thinking 'Exponential" with Intel® X^{e} architecture compute and graphics processors

Intel® architecture processors are the flexible, large memory capable, performance engines that drive the end-to-end creative process for visual effects and animated feature films. Today's available GPUs have architecture challenges like memory size limitations and performance derived from years of honing for less sophisticated, "embarrassingly parallel" rasterized graphics use models. Studios continue to reach for maximum realism with complex physics processing for cloth, fluids, hair and more, plus modeling the physics of light with ray tracing. These algorithms benefit

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from mixed parallel and scalar computing while requiring ever growing memory footprints. The best solutions will include a holistic platform design where computational tasks are distributed to the most appropriate processing resources.

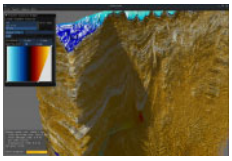
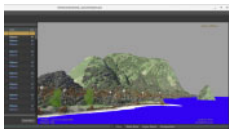
David Blythe's recent blog provided initial insights into our exciting new Intel® X^e architecture currently under development. We are designing the Intel® X^e architecture as a cohesive acceleration companion to our continuing roadmap of Intel® Xeon® processors. As David closed his blog he mentioned, "We will look forward to sharing more details on the Intel® X^e architecture in the months ahead." I'm pleased to share today that the Intel® X^e architecture roadmap for data center optimized rendering includes ray tracing hardware acceleration support for the Intel® Rendering Framework family of API's and libraries.

Your existing investments in graphics and rendering solutions based on Intel® Rendering Framework open source products will seamlessly map to the exponential performance benefits of these flexible accelerated platforms. Further, ray tracing as a general computational guru technique for a variety of simulation computation beyond rendering is rapidly growing. To put it succinctly in my own words "Leave no transistor behind" by creating a holistic software and compute environment ready to maximize your workflow for exponential benefits.

Partnership and community: announcing Intel Graphics and Visualization Institutes of XeLLENCE

In order to better ensure advanced graphics and visualization capabilities are broadly available to the professional rendering, scientific visualization and virtual design communities, I am thrilled to announce that Intel® is supporting the establishment of Intel® Graphics and Visualization Institutes of XeLLENCE (Intel® GVI). Three world class founding institutions have been selected.

Through collaboration with Intel® Graphics and Visualization Institutes of XeLLENCE and our industry partners who leverage Intel® Rendering Framework, Intel® Xeon® Scalable processors and, in the future, Intel® Xe architecture; Intel will continue to enable delivery of leadership solutions for high fidelity studio assets creation.

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Gomez Addams
Junior Member

Posts: 9
Joined: 2019-04-15

#5665066 Posted on: 05/01/2019 11:57 PM

If you look closely at the first image it was rendering at less than 9 FPS. That's not very impressive. Actually this whole thing is not very impressive. I'll stick with GPUs.

Ridiric
Senior Member

Posts: 169
Joined: 2016-09-08

#5665153 Posted on: 05/02/2019 10:46 AM

> If you look closely at the first image it was rendering at less than 9 FPS. That's not very impressive. Actually this whole thing is not very impressive. I'll stick with GPUs.

Actually first image is closer to 90fps if the time to render is under 10ms like it looks like its showing, the second picture is just under 9fps though.

Nevermind my bad, pictures in article didn't load for ages for some reason, was looking at picture links in the bottom of the article which are in the opposite order.

Whole debate is kinda pointless though, cause we don't know exactly what was rendered and how well a normal graphics card would render it as they don't give those results.

Glidefan
Don Booze

Posts: 12468
Joined: 2000-05-23

#5665422 Posted on: 05/03/2019 10:09 AM

No the first image is 113.14ms, its a tad under 9fps. But the reason why this is impressive, its because of the data volume. That scene is so big, a GPU would go "Nope. Naha'. Don't have the space."
Yeah, Crysis had a similar view, but in crysis things up far were billboards. In this one they weren't i think. It's the actual scene they used in Moana.
If i remember correctly, Disney released a couple of scenes to the public some time ago, this one included, for people that wanted to learn the tool chain.
Saw the file size and was like "nah i'm fine."

jura11
Senior Member

Posts: 1943
Joined: 2015-03-20

#5665445 Posted on: 05/03/2019 12:33 PM

Agree these scenes or rather data are huge for any GPU although now with RTX and NVLink you can double yours VRAM in some renderers but problem is you can use only same GPUs

Intel recently released Denoiser which I use right now and in many cases is fast or faster as Nvidia denoiser

Hope this helps

Thanks, Jura

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