CASE STUDY

CHAOS ADOPTS HIP TO UNLEASH AMD RADEON™ ACCELERATION IN V-RAY GPU

Using the open-source HIP toolkit, Chaos was able to port the GPU functionality of its industry-leading V-Ray renderer to harness the power of AMD GPUs

AMD × chaos

For over 20 years, Chaos V-Ray has been an essential part of an artist's toolkit. The photorealistic render engine is currently the renderer most widely used for architectural visualization according to a survey of architectural professionals[1], and has been used to create VFX for a wide range of commercials, games cinematics, films, and TV shows, including *Deadpool*, *Ant-Man*, and *Agatha All Along*.

V-Ray already performs impeccably on AMD GPUs, but Chaos has now added Radeon GPU support. At the AU 2025 Design and Make conference, Chaos showcased a demo of V-Ray GPU running on an AMD Radeon™ GPU. These changes to V-Ray's code base will give users the freedom to choose a wider range of hardware, such as powerful, affordable AMD Radeon™ PRO GPUs and AMD Ryzen™ AI Max+ processors.

HOW V-RAY HARNESSES THE POWER OF AMD HARDWARE

V-Ray provides users with a choice of two render engines. The CPU engine, used for the most demanding tasks, like rendering ultra-high-resolution architectural stills and complex, final-quality visual effects, performs beautifully on AMD processors. As of August 2025, the 10 highest scores reported from Chaos's publicly available V-Ray Benchmark are from AMD EPYC™ or AMD Ryzen™ Threadripper™ PRO CPUs.[2]

But the GPU-accelerated render engine presented more of a challenge. V-Ray GPU is also used for interactive visual feedback on in-development projects, but previous versions of the rendering engine only supported NVIDIA GPUs. This, in turn, meant Windows users were limited to NVIDIA graphics cards. Given the complexity of its code, it was hard for Chaos to maintain a separate code base to support other hardware.

INDUSTRY
Architecture, Engineering and Construction, Media & Entertainment

CHALLENGES
Promote customer choice by updating the industry-leading V-Ray renderer to support AMD GPUs

SOLUTION
Use the Heterogeneous-Compute Interface for portability (HIP) to update the existing V-Ray GPU code to support AMD GPUs and processors

RESULTS
Despite the complexity of V-Ray GPU's code base, Chaos was able to implement support for AMD GPUs in the GPU renderer under a year, demonstrating the results publicly at the AU 2025 conference

AMD TECHNOLOGY AT A GLANCE

- HIP API and kernel language
- AMD Radeon™ PRO W7000 Series GPUs
- AMD Ryzen™ AI Max+ processors
- AMD Ryzen™ AI PRO 300 Series Processors for Workstations

Forest scene rendered using Chaos V-Ray GPU running on AMD Radeon™ GPU

HIP LETS DEVELOPERS SUPPORT AMD GPUS WITHOUT WRITING CODE TWICE

The solution was HIP: the Heterogeneous-Compute Interface for Portability. Unlike OpenCL, the open-source HIP toolkit enables developers to port existing CUDA GPU-enabled applications to run on AMD processors without the need to create and maintain a new code base.

"HIP is a lot closer to how other architectures work," says Vladimir Koylazov, Chaos's Head of Innovation, and the recipient of an Academy Award for his work on V-Ray. "It's a different API, for sure, but not so different that you have to rewrite everything from scratch."

> **"Everything we support in V-Ray GPU on other platforms is now supported on AMD GPUs."**
> *- Vladimir Koylazov, Head of Innovation, Chaos*

HIP HELPED CHAOS PORT V-RAY GPU'S CORE CODE TO AMD PROCESSORS

Working in collaboration with AMD engineering, Chaos was able to port V-Ray GPU code to run on AMD Radeon GPUs in under a year.

> **"It was really nice to see [our USD test scene] being rendered on an AMD [Ryzen™ Max+ processor]. It wouldn't be possible on a discrete GPU, because they don't normally have [enough] memory."**
> *- Vladimir Koylazov, Head of Innovation, Chaos*

"HIP handles complicated pieces of code, like V-Ray GPU, a lot better than OpenCL used to do, says Koylazov. "Everything we support in V-Ray GPU on other platforms is now supported on AMD GPUs."

Chaos plans to roll out the changes publicly in every edition of V-Ray, to make it possible to use AMD GPUs to accelerate V-Ray GPU inside a range of industry-leading 3D design applications, including Blender, 3ds Max, Maya, SketchUp, Revit and Rhino.

HIP WILL LET V-RAY USERS CHOOSE THE HARDWARE THAT WORKS BEST FOR THEM

The updates will enable V-Ray users to choose from a wider range of workstation graphics cards, such as those from the AMD Radeon™ PRO W7000 Series GPU.

"It's nice that users have the opportunity to run the software on AMD GPUs," says Koylazov. "Everyone wants results faster, and [with a powerful GPU], that's what they get."

Chaos has also tested V-Ray GPU on the integrated graphics processor in the AMD Ryzen™ AI Max+ processor, where V-Ray benefits from the huge pool of shared memory. With the new 128GB Ryzen™ AI Max+ 395 processor, up to 96GB of the unified memory can be allocated as VRAM through AMD Variable Graphics Memory.

"You can load massive scenes without having to worry so much about memory limitations," says Koylazov "We have a massive USD scene that we use for testing, and it was really nice to see it actually being rendered on an AMD [processor]. It wouldn't be possible on [most] discrete GPUs, because they don't normally have that much memory."

> **"HIP handles complicated pieces of code, like V-Ray GPU, a lot better than OpenCL used to do. The complexity of the shaders can be a lot bigger."**
> *- Vladimir Koylazov, Head of Innovation, Chaos*

AMD AND HIP: A WINNING COMBINATION FOR V-RAY USERS

Thanks to HIP, Chaos was able to port V-Ray GPU's existing code to take advantage of the unique capabilities of AMD hardware.

When released, the work will give architectural and visual effects professionals the freedom to choose from a much wider range of production hardware, including desktop systems with powerful AMD Radeon™ PRO workstation GPUs, and laptops with cutting-edge AMD Ryzen™ AI Max+ processors.

"I think it's important for users to have a choice of hardware, whether it's CPUs or GPUs," says Koylazov. "It also helps to push the industry as a whole. [Only being able to use GPUs] from one player, no matter how good they are, is not necessarily a good thing." Koylazov also praises the "really awesome support" that AMD provided to Chaos during the development process.

"The amount of support we received has been above and beyond my expectations," he says. "With any problems we've come across, AMD has been able to suggest solutions or modifications to the code to make things work. It was a very active collaboration."

> **"The support we got from AMD has been really awesome, both with engineering resources and hardware. It was above and beyond my expectations."**
> *- Vladimir Koylazov, Head of Innovation, Chaos*

ABOUT Chaos

Founded in 1997, Chaos provides world-class visualization and design solutions that empower creative minds to bring ideas to life. The company serves multiple industries, including architecture and design, media and entertainment, and product e-commerce, providing an ecosystem of accessible tools that support every stage of the design and creation process. Its innovative solutions help architects, designers, VFX artists/animators, and other creative professionals share ideas, optimize workflows and create immersive experiences. For more information, visit **chaos.com**.

ABOUT AMD

For more than 50 years AMD has driven innovation in high-performance computing, graphics, and visualization technologies. Billions of people, leading Fortune 500 businesses, and cutting-edge scientific research institutions around the world rely on AMD technology daily to improve how they live, work and play. AMD employees are focused on building leadership high-performance and adaptive products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the AMD (NASDAQ: AMD) **website**, **blog**, **LinkedIn**, and **X** pages.

ENDNOTES

1. **2025 CGarchitect Rendering Engine Survey Report**
2. **V-Ray 6 Benchmark**

DISCLAIMERS

COPYRIGHT NOTICE