Solution Brief

Accelerated Architectural Rendering

Visual Computing

D5 Render Powers Through Complex Architectural Visualizations

Capitalizing on the high-performance media engines within Intel® Arc™ graphics technology, D5 Render delivers accelerated rendering to architectural visualization projects.

"D5 has expanded the possibilities and is enpowering people to re-imagine what architectural visualization can be like. Our pursuit of enhanced real-time graphics is a key to that, and Intel Arc technology contributes to our goals. I'm gratified to see that Intel has the determination and vision to work with D5 together as a partner on this exciting journey."

– Niu Zeping, D5 Founder

D5 RENDER

Architectural illustration has been around ever since humans began creating buildings, but only recently with sophisticated software can we visualize — in photorealistic detail — elaborate buildings, surrounding grounds and atmospheric embellishments. D5 Render is a recent entrant into this space and one of the more accomplished applications in the market. The application takes advantage of numerous Intel Arc capabilities, thanks to the collaborative work with D5 engineers.

Performance-Related Challenges

Many of the challenges faced by users of high-end architectural programs are performance related. Typical operations are too slow — including waiting for 3D scenes to render, previewing 3D designs being modeled and interacting with scenes that include virtual reality (VR) technology.

Tackling Ray Tracing Bottlenecks

The operations involved in architectural visualization place exceptional demands on compute resources, largely because D5 Render makes extensive use of real-time ray tracing. D5 Render is optimized for quick previewing of scenes in progress, interacting with scenes in virtual reality (VR) environments, and final rendering of projects. Working together, D5 and Intel discovered the most effective ways to use the capabilities of Intel Arc Graphics technology to power through complex visualization tasks to share previews rendered in real time with clients.

Enabling Efficient Rendering

The Intel engagement with the D5 Render team involved optimization of two compute platforms. One was a desktop machine featuring the Intel® Core i7-12700K equipped with an Intel Arc™ A7-series discrete graphics card. With a minimum of 32 GB of DDR5 memory, this is considered the recommended hardware configuration. The other platform used was a laptop featuring an Intel Core i7-12700H with an embedded Intel Arc A7M mobile series graphics card and a minimum of 16 GB DDR5 memory.

During development, Intel and D5 focused much of their collaborative work on optimizing the graphics driver to work efficiently with the Intel Arc hardware components and ensuring that the Intel Xe Super Sampling (XeSS) SDK delivered expected performance. XeSS technology performs AI-driven upscaling to synthesize images close to the quality of the high-resolution originals, enabling high performance and high-fidelity visuals. Real-time render previews and interaction with VR scenes are made possible with XeSS.

The team analyzed the program flow to identify and eliminate bottlenecks and other issues. The Unreal Engine 4 (UE4) use was analyzed in combination with the Intel debugging toolkit by the team to identify any bugs that were hampering operation or performance.

Through improvements to the Intel Arc Graphics driver, hardware firmware and optimizing interoperability with XeSS, performance goals were met and operations involving Intel Arc were substantially boosted.

Intel Project Contributions

Early access to Intel technology and the availability of software toolkits (such as the XeSS SDK) and resources gave D5 the support to bring the rendering capabilities of D5 Render to an optimal level.

Resources such as the Intel Media SDK and Intel Open Image Denoise Library also helped make the overall development more efficient and obtain the best results with the real-time ray tracing rendering operations.

New Features of D5 Render

- Round corner for materials, level of detail switch, batch import PBR textures, outline mode, optimized clouds and fog, enhanced denoising algorithm.
- Animation control for dynamic models.
- Added alerts when there is lack of space on the disk.
- Optimized scene statistics tool checks the resource usage.
- Support for Intel Arc graphics products and Intel® Xe Super Sampling (XeSS).

Refining and Optimizing D5 Render Features

Above all, D5 Render was developed to overcome the common, unacceptable lag in ray-tracing performance and create a fast, responsive architectural visualization tool. Dramatic improvements in the speed of rendering 3D previews and the delivering of high-quality visuals when viewing and previewing scenes during VR development represent major milestones in applications of this type.

Emphasis was put on developing a smooth workflow for users and a interface designed for efficiency, allowing users to generate impressive imagery in a relatively short time. A rich supply of assets is available to meet architectural and landscaping projects needs.

A welcome addition to D5 Render is a LiveSync plug-in for the open-source app Blender that converts content from this 3D creation suite, improving efficiency and smoothing the workflow between Blender and D5 Render.

> "D5 preset asset library now has 2000+ vegetation assets located in detailed categories. From shrubs to broadleaf plants, you can find whatever vegetation that suits different scenes and cases of yours. For us, we have a lot of cases of large multifunctional parks with an aerial view, and D5 Library meets our needs both in quantity and quality."[1]
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> **– D5 Render User, Inteview with Yuasse, Landscape Visualization Company**

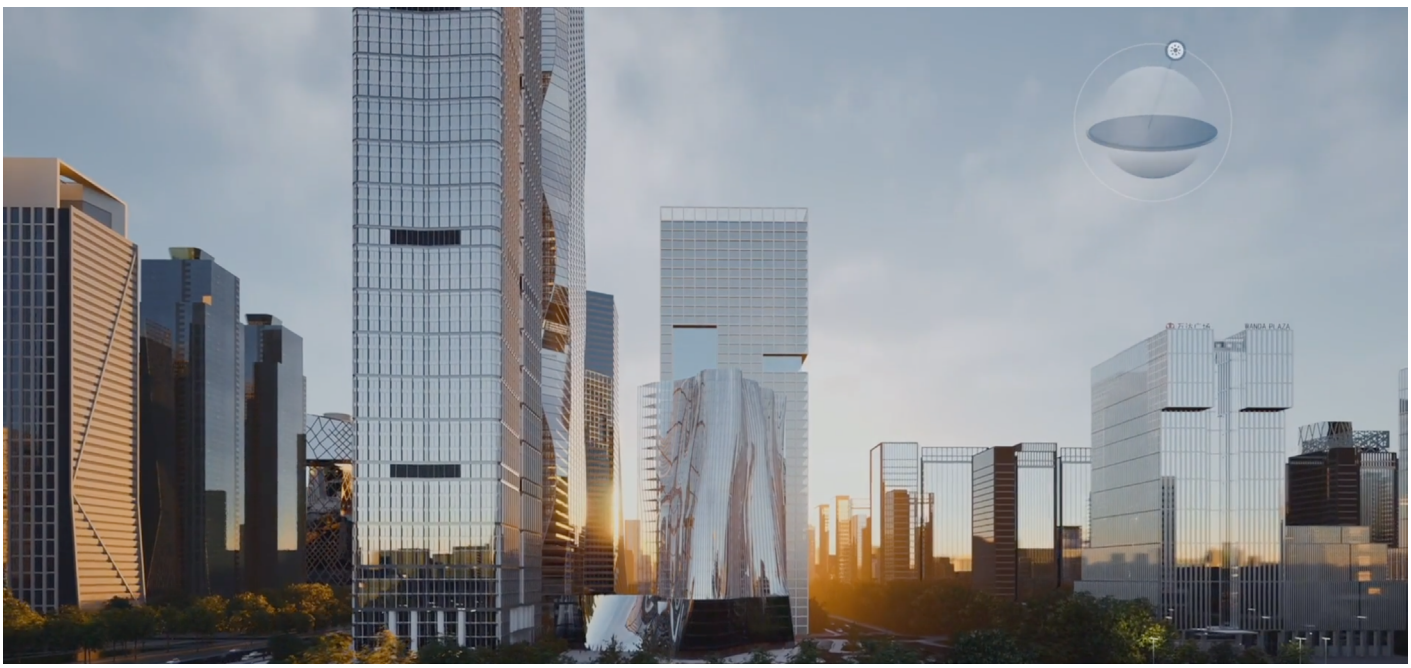

Figure 1. Using XeSS technology, D5 delivers full-featured real-time rendered previews of scenes under development.

Resources

Free Trial of D5 Render

As a recent entrant into the field of architectural visualization, D5 Render focuses on accelerated rendering speeds and ease of use. The full feature set of D5 Render can be experienced by downloading a free trial.

Learn more ›

About Dimension 5 (D5)

Located in Nanjing, Jiangsu, China, Dimension 5 is a technical service provider that creates better service scenarios for home and design companies. Dedicated to eliminating tiresome bottlenecks in the rendering of architectural visualizations, their recently released product — the D5 render application — uses the latest technologies to deliver real-time rendering, surpassing last-generation performance significantly.

d5render.com

intel

1. https://www.d5render.com/post/top-notch-rendering-workflow-for-landscape-designers-speed-up-visualization-with-d5-render

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