NVIDIA IRAY ENABLES RAPID PRODUCTIVITY AND CREATIVITY FOR RENAULT CAR DESIGN AND TESTING

Designing a new car is no small task. Everything – from the obvious (the engine, the interior) to the less obvious (the light simulations inside of a new headlight design) needs to be designed, created, refined and so on until it is perfect.

In the past, that meant physically constructing each design iteration and subjecting it to a number of tests in various real world environment.

Now, NVIDIA technology enables much of this design analysis to be conducted virtually, using the world's first GPU-accelerated, physically based photorealistic rendering solution, NVIDIA Iray. And one of the first companies to employ this breakthrough ray-tracing technology in production was Renault. Now they are as well on the leading edge of technology with the integration of Iray for Maya into their workflows.

ABOUT RENAULT DESIGN DIGITAL VISUALIZATION

Renault Design Digital Visualization is a twelve-person team of CG artists, specialists and programmers with a unique range of skills, operating within Renault's Technocenter in the municipal district of Guyancourt, some 20km west of Paris.

Working primarily in a bespoke rendering solution called "3VISU," based on Autodesk Maya, the team is responsible for the creation of images and video of closed-door concepts. It also provides external imagery for design-stage presentations that need high quality visualizations or light simulations for review. They produce up to 5000 movies and countless still images each and every year.

CHALLENGE

Faced with increasingly short production timelines, Renault Design Digital Visualization needed the ability to process and render changes to images very quickly without having to pre-compute light-maps and other pre-processing tasks.

Image Courtesy of Renault

On a CPU, such images would take hours to render; in this case, images needed to be re-workable during workshop sessions with designers.

SOLUTION

Three years ago, the Renault Design Digital Visualization team was introduced to the capabilities of NVIDIA Iray software to generate imagery of outstanding photorealism using physically based light simulation.

In order to ensure it had the required graphics processing power, the team chose to upgrade each of its current 40 render nodes with dual professional NVIDIA GPUs, this boosting the speed of Iray rendering.

Last year, and now with significant hardware capability at its disposal, Renault Design Digital Visualization began working with NVIDIA Iray, a GPU-accelerated, physically-based photorealistic rendering solution. In doing so,

Renault embraced the full power of its desktop and render farm GPUs' rendering capabilities.

By having access to Iray within their established workflow using [0x1] Iray For Maya,® Renault Design Digital Visualization lost no time in training or migration of skills, enabling the team to take full advantage of its GPU render farm's capabilities from within software while using software with which they were already very familiar.

IMPACT

With incredible rendering power and speed at its fingertips, the Renault team is now able to get closer to final rendering stages far more rapidly than ever before.

"Switching to Iray ray tracing was like a dream – we can go so quickly from 'idea' to 'render'," explains Renault Design Digital Visualization's Guillaume Shan. "There's no pre-processing requirement. Material and geometry changes are made extremely easy to handle interactively and in near real-time."

Iray's 'push-button' rendering approach marries ease of use during scene setup with the highest-quality photorealistic final frame output and interactive performance. Iray also progressively refines the image until maximum fine detail is reached, providing a single process which combines interactive pre-visualisation and final frame rendering.

Because Iray delivers results that perfectly reflect the real-world behavior of light particles, it can also be used for rapid prototyping of headlight designs. Such accurate, fast ray tracing enables the team to realistically model how light

Image Courtesy of Renault

> "We wanted a renderer that was good at everything, interactive and compatible with our current workflow," says Shan. "Iray is a great success at Renault because it is not only fast and great quality, but also so easy to use. It's a perfect match for car design needs; most of all, it enables unbridled creativity – it's a great technology to be creative with!"
>
> Guillaume Shan, *Renault Design Digital Visualization*

enters and leaves a headlamp lens based on true physical properties in order to measure such factors as light distribution, lateral illumination and glare. This is a vital step in ensuring new designs meet strict regulations at an early stage in the design of a vehicle.

"As well as still images, we often receive requests for animation and video," Shan continues, "and Iray is very well adapted to handling complex animated scenarios (such as animated cars, geometry deformers, animated materials or emitters). All of this can be keyframed from within Maya."

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The team was also impressed how easily its existing workstations and render farm nodes were upgraded using NVIDIA Quadro and Tesla GPU technology.

"Renault Design IT provided us with the right tools for our needs." explains Shan, "Now we can upgrade the GPUs in our workstations and render farms more often – and far more easily." Renault Design Digital Visualization currently uses NVIDIA Quadro K6000 GPUs in its workstations.

AT A GLANCE

CUSTOMER PROFILE

Company: Renault Group

Industry: Automobile manufacturing

Region: Europe, Asia, Americas

Size: 125,000 employees

SUMMARY

> Renault Design Digital Visualization

> Produces up to 5000 movies and countless still images every year for closed-door concepts

> Uses batch rendering with NVIDIA Iray

> Established workflow using [0x1] Iray For Maya

SOFTWARE

> Autodesk Maya

> [0x1] Iray For Maya

HARDWARE

> NVIDIA Quadro and Tesla GPUs

> HP server and workstation

To learn more about NVIDIA Quadro, go to **www.nvidia.com/quadro**

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