Features at a Glance

- Photorealistic visualization: Arrange virtual prototypes in a lifelike environment

- Lit appearance: Calculate a lighting system's lit appearance and assess performance

- Unlit appearance: Envision the aesthetics of a lighting system in daylight conditions

- Ease of use: Quickly assess and improve a lighting system at any stage of product development with simple, intuitive controls

- Human eye imaging: Simulate on the screen how a lighting scene would be perceived by the human eye

About the LucidShape Products

The LucidShape® product family provides a complete set of design, simulation, and analysis tools for the development of automotive lighting. Backed by cutting—edge, proprietary algorithms to calculate optical surfaces optimized for automotive applications, LucidShape empowers designers to develop, verify, visualize and deliver high-quality designs while reducing product development time.

LucidShape Visualize Module Overview

For product visualization and communication at any stage of design and development, photorealistic imaging is an ssential tool for technology—driven companies. In automotive lighting, photorealistic imaging is used to assess not only the overall aesthetics of a design, but also the beauty of its lit appearance and fulfillment of its intended function. For example, for a company designing a signature headlight, a photorealistic image can help detect undesirable artifacts in the lit appearance prior to expensive tooling and fabrication.

LucidShape's Visualize Module delivers high-speed photorealistic images of an automotive lighting system's lit and unlit appearance. Because the Visualize Module depicts all interactions between system geometry and light sources, it provides designers with a physically correct diagnostic tool for evaluating how a lighting system will be perceived by the human eye.

Designers can use the visualizations to quickly pinpoint aspects of a design that impact the appearance of the lighting system, and then make tradeoff decisions related to manufacturing, time to market and the design itself. The Visualize Module reduces the need for physical prototyping.
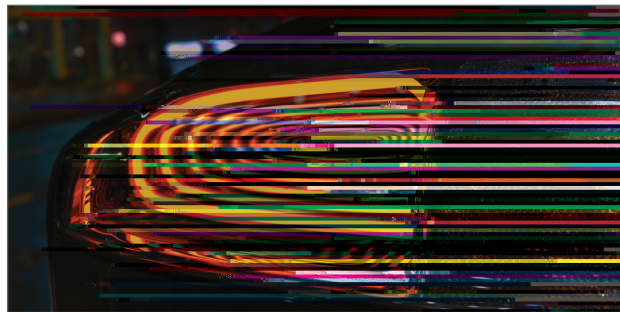

Figure 1: Lit appearance image created in the LucidShape Visualize Module

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Photorealistic Visualizations

The Visualize Module is an add-on tool to LucidShape and uses the following techniques to produce photorealistic simulations of your lighting model:

- Backward ray tracing
- Luminance camera
- Environment sources

Backward Ray Tracing

The Visualize Module uses backward ray tracing to perform ef cient, high-accuracy luminance calculations and generate photorealistic renderings. The backward ray tracer can use all types of light sources, including environment sources. It supports all ray tracing modes included in LucidShape: NURBS, fast tessellated, and the ultra-fast GPUtrace™ that can accelerate simulations by an order of magnitude in addition to multithreading capabilities.

Luminance Camera

The luminance camera is a special type of sensor in LucidShape that captures the lit or unlit appearance of a design. In the Visualize Module, the luminance camera is used to generate photorealistic images at multiple angles and viewing directions. For example, you can invert the viewing direction of a scene to visualize a lighting design from the perspective of the driver's seat.

Environment Sources

The Environment Source feature links a LucidShape light source to an external .EXR file for the integration of 360-degree, high-dynamic range (HDR) photographic environments that illuminate your model in photorealistic simulations.

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