Synopsys Announces New Release of LucidShape Software for Automotive Lighting Design and Analysis

Version 2019.09, Now Available, Introduces Design Features for Freeform Optics and Pixel Light Technology

MOUNTAIN VIEW, Calif., Sept. 17, 2019 /PRNewswire/ -- Synopsys, Inc. (Nasdaq: SNPS) today announced the latest release of its LucidShape® software for the design, simulation, and analysis of automotive exterior lighting products. LucidShape version 2019.09 gives designers new tools to create sophisticated freeform reflectors and dynamic pixel light headlamps, as well as enhanced tools for visualization.

- **New Freeform Design feature**: Freeform optical surfaces provide many advantages over conventional optical surfaces for meeting complex illumination requirements such as precise light control, innovative styling, and compactness. LucidShape's MacroFocal feature for the design of multifaceted reflectors has been augmented with state-of-the-art freeform design capabilities to provide more granular control over light spread, enabling the specification of two-dimensional light target distributions. The new freeform surface capabilities allow designers to minimize or eliminate the need for multiple rows of facets. As a result, stray light caused by gaps between facets can be minimized, flux collection is maximized, and designers can have more freedom to focus on styling and appearance. In addition, the new capabilities can simplify manufacturing-related processes such as reflector metallization and tooling.
- **New Pixel Light features:** LucidShape's Pixel Light features support the efficient design and simulation of high-resolution pixel light headlamps. A pixel light system subdivides the headlamp beam pattern into angular segments that can be controlled individually and adapted dynamically to accommodate changing driving and traffic conditions. One challenge in modeling a pixel light headlamp is the complexity created by the large number of source pixels, each of which must be individually simulated. LucidShape's Pixel Light design feature streamlines the process of creating the source grid for common pixel headlight configurations. Designers can then perform a complete simulation of the model with the Pixel Light simulator, which efficiently handles a large number of pixels to produce a physically correct beam pattern.
- **Enhanced visualization:** The LucidShape human eye vision image (HEVI) capability has been extended to give designers more flexibility to control image brightness, contrast, and color shift. The HEVI capability is included in LucidShape's Visualization Module, which provides physically accurate photorealistic images of an automotive lighting system's unlit and lit appearance and enables designers to evaluate how the human eye will perceive a lighting system.

"Our LucidShape solutions are used by industry-leading automotive OEMs, Tier 1, and Tier 2 suppliers to develop lighting systems that meet their evolving functionality, branding, and safety requirements," said Stuart David, group director of applications engineering, Synopsys' Optical Solutions Group. "The latest release of LucidShape provides our customers with enhanced design and visualization capabilities that will open doors to further automotive lighting advancements and innovations."

Synopsys will showcase its LucidShape and LightTools® products at the International Symposium on Automotive Lighting (ISAL), September 23-25, 2019 at the Science and Congress Centre in Darmstadt, Germany.

About Synopsys LucidShape Products

Synopsys' LucidShape products provide a complete set of design, simulation and analysis tools for automotive lighting. With dedicated algorithms tailored for automotive applications, LucidShape software facilitates the design of automotive forward, rear, and signal lighting reflectors and lenses. The LucidShape CAA V5 Based product is an interactive tool that allows designers to perform optical simulations and analyses of automotive lighting products within the CATIA V5 environment, as well as build, analyze, and optimize light guides. The LucidDrive® tool provides the ability to perform virtual night-driving simulations that generate realistic lighting scenes in real time, which allows designers to quickly and accurately evaluate beam patterns for exterior automotive lighting applications on the road, traffic signs and surroundings prior to expensive fabrication and testing. For more information, visit https://www.synopsys.com/optical-solutions/lucidshape.html.

About Synopsys

Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As the world's 15th largest software company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP and is also growing its leadership in software security and quality solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing applications that require the highest security and quality, Synopsys has the solutions needed to deliver innovative, high-

quality, secure products. Learn more at www.synopsys.com.

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