

# LucidShape Modules

## Automotive Lighting Design Software

### Base Module

The LucidShape Base Module includes the following functionality:

- LucidStudio, an interactive environment for design and simulation
- Basic geometry features
- Simulation kernel
- Analysis functions:
  - Measurement tables for automotive lighting for ECE, SAE and JIS regulations
  - Light data analysis and operations: gradients, filter, addition, subtraction, scale, mirror, etc.
  - Light data display properties such as log/linear scale and color mode
  - CIE TC4-45 headlamp benchmark
- CAD import and export

All other LucidShape modules are fully integrated in the Base Module.

### LucidShape FunGeo

Our proprietary FunGeo algorithms automatically calculate and construct optical geometries based on user-defined illuminance and intensity patterns. This unique, functional approach gives you the freedom to focus on overall design objectives rather than the implementation details of complex optical components.

#### FunGeo MacroFocal Module

Supports the design of all automotive lighting functions, including headlamps:

- Freeform reflectors and lenses
- Automatic cut-off calculation
- Freestyling definition via base grids

#### FunGeo Procedural Surface / Poly-Curve System Module

Supports the design of all automotive lighting functions, including headlamps:

- Freeform reflectors and lenses
- Projector module headlight design
- Smooth and pillowed reflectors and lenses for signal functions

#### FunGeo Optimizer Module

Automatically changes geometry parameters to achieve the best design solution.

#### FunGeo Backlighting Module

Supports the design of automotive backlighting systems:

- Prism bands for light pipes
- Dot masks
- Retroreflectors
- Light guides

#### Visualize Module

Delivers high-speed photorealistic renderings of lit and unlit appearance. Includes:

- Environment light source
- Backward ray trace simulations
- Backward luminance camera
- High-Dynamic Range (HDR) Viewer

#### LucidCOM Module

Provides a programming API to automate LucidShape operations and develop custom solutions.

#### GPUTrace Module

Accelerates LucidShape illumination simulations using NVIDIA graphics cards.

For more information, visit [synopsys.com/optical-solutions/lucidshape.html](https://www.synopsys.com/optical-solutions/lucidshape.html)