Ansys

OPTICS

Ansys Optics for Automotive: End-to-End Multiphysics & Multiscale Simulation Platform

Ansys / LUMERICAL

Multiphysics Photonic Modelling

- Design components & circuits
- Diffractive optics & waveguides
- Emissive structures

/ From Nano / Micro

Ansys / ZEMAX

Optical Component Modeling

- Lens stack optimization
- Optomechanical tolerancing
- Structural & thermal optics

/ To Macro

Ansys / SPEOS

System Level Modeling

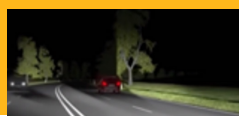
- 3D environment integration
- Human vision / perception
- Lighting

/ To System

/ Exterior & Interior Lighting

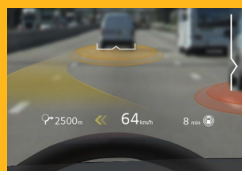
- Design from the emissive pixel & pixel array assembly, to micro-lens arrays, up to human perception experience (e.g., adaptive / predictive headlamps, light carpet microlens arrays, daytime running lights, rear-light diffractive microstructures, lightguides, etc)
- Verify standard compliance & perceived quality: uniformity, color, beam shape, brightness, etc
- Perform texture mapping, colorimetry & photometry analysis to validate materials & light sources
- Predict stray light, hot spots, and optimize functional / ambient lighting

/ Human Factors



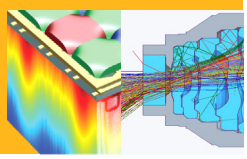
- Consider the effect of bright sunlight-material interaction and glare on the driver's comfort
- Evaluate reflections from internal light sources on windshields and side glass
- Material validation for improved ergonomics for human vision experience
- Optimize for reduced day / night veiling glare
- Predict display washout

/ Displays and Heads-Up Displays



- Optimize photometric simulation & human vision experience including geometric optics down to the design of emissive pixels (Micro-LED, LED, OLED), stacks of thin-film coatings & diffractive optics
- Control projection of light & viewing angle, loss, power consumption, glare & reflections, brightness, chromaticity, contrast, and readability
- Account for operating temperatures, atmospheric conditions & ambient lighting
- Robust optimization methods against merit function

/ ADAS/Autonomous Driving (Cameras, LiDAR)



- Optimize photonic integrated LiDAR chip (e.g., optical phase array antenna, lasers, photodetectors)
- Optimize form factor, power consumption, crosstalk, resolution, depth of field, FOV, etc
- Design imaging lens & collimating optics modules
- Thermomechanical, packaging & straylight, and motion blur analysis
- Image sensor, ToF analysis, camera vision & sensor perception analysis

✓ Safety ✓ Ergonomics ✓ Perceived Quality