Radiance Lighting Simulation

BERKELEY LAB

## The Preeminent Lighting Simulation Software

Accurately Visualizing Daylight Advances Human Health and Saves Energy

Since 1985, software developed at Lawrence Berkeley National Laboratory (Berkeley Lab) has helped architects and engineers visualize and analyze the impact of light in the built environment. Radiance began as a research project at Berkeley Lab and has evolved into a powerful calculation engine that most major design tools rely on. As research continues to reveal the psychological and physiological importance of natural light, and as new daylight harvesting technologies enter the market, architects and engineers increasingly use Radiance calculations to maximize natural light and create more harmonious and efficient environments.
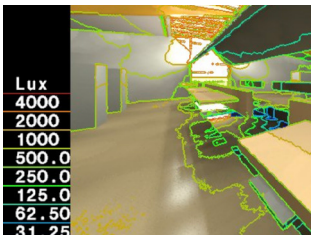
Accurate
Relying on the physical principles of illumination, Radiance simulates the behavior of both daylight and electric light on material surfaces.
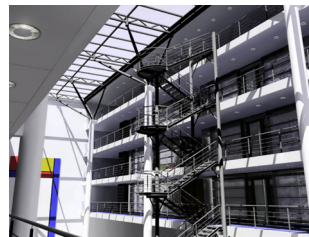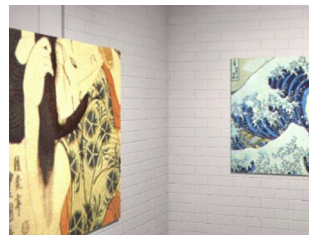
Open
Open-source software invites contributions from others and enables dozens of other design tools to incorporate Radiance into the back end.
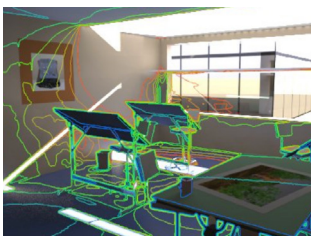
Validated
No other daylighting calculation has undergone more rigorous validation; dozens of evaluations have verified its accuracy.

Flexible
Designed as a calculation engine, Radiance has supported diverse applications, such as forensics and aerospace. Modular design allows for easy expansion.

Powerful
The use of probability and backward ray-tracing minimizes the impact of complicated geometry. Radiance excels at difficult problems.

Evolving
Radiance is constantly updated. On the horizon, deeper integration with EnergyPlus and non-visible lighting calculations, such as circadian stimulus.

All images created with Radiance Software
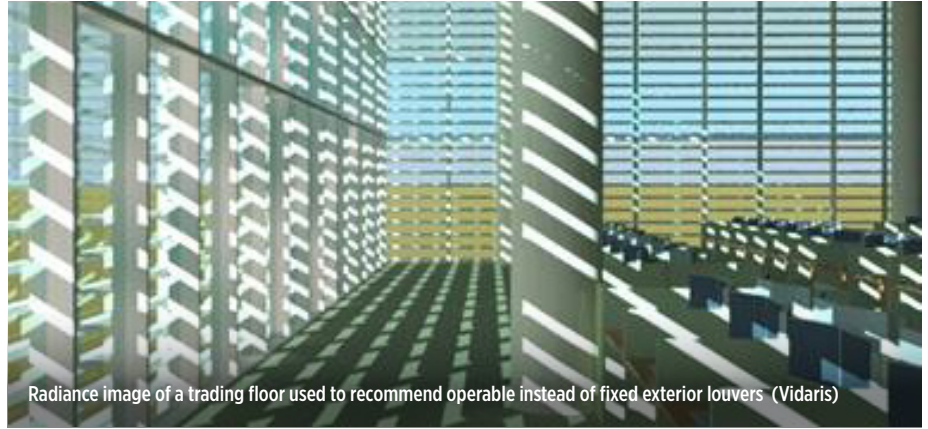
Invaluable Tool for Understanding Light

Architects, engineers, researchers, codes and standards experts—all rely fundamentally on Radiance

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We've used Radiance to maximize daylighting across millions of square feet of commercial real-estate

"We recommend Radiance more than any other lighting simulation tool, especially when it comes to glare analysis and qualitative aspects of lighting and visual comfort. Radiance has helped us determine placement, openness factors, visible transmittance, and the controls of shades and louvers for millions of square feet of commercial and institutional space."

Vineeta Pal
Senior Energy Analyst, Vidaris

Radiance image of a trading floor used to recommend operable instead of fixed exterior louvers (Vidaris)

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Radiance's flexibility in simulating light throughout the year has been indispensable for our EC window development

"Radiance is the only daylight simulation engine with the flexibility to create custom workflows for dynamic annual simulations. The ability to customize output that can integrate with energy simulations and to generate project-specific coefficients for configuring algorithms has proven invaluable in developing our electrochromic windows."

Andy McNeil
Product Manager, Kinestral

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Radiance always teaches me something new about lighting

"Radiance's ray-based analysis is almost limitless. It's a powerful tool that is easy to integrate into different analysis workflows, and it produces such realistic renderings that sometimes it's hard to tell them from photographs. Also, because of its solid grounding in physical-based simulation methods, it's always teaching me something new about lighting."

Zack Rogers
President, Daylighting Innovations; Director of Engineering, Lightlouver LLC

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Radiance has been integral to our development of custom lighting software

"For the past 20 years, I have used Radiance in all of my lighting research projects. Radiance facilitates advanced research so efficiently that we teach it to all graduate students in the Department of Architecture. Because of the flexibility of its engine, we've used it to develop customized software for per-pixel image analysis and circadian light metrics."

Mehlika Inanici
Associate Professor, University of Washington