Radiance 3.4 and Open Source Development

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Talk Overview

- *Radiance* Development History
  - The Good
  - The Bad and the Ugly
- *Radiance* 3.4
  - What is There
  - What is Missing
- Open Source Development

Radiance Development History

- First Official Release 1.0 in January 1989
- LBNL Releases through 3.1 in July 1997
- Code Split Three Ways:
  - LBNL MPI parallel rendering development
  - LBNL *Desktop Radiance* development
  - SGI Holodeck development
- New Release 3.4 in January 2002

The Good: 1 Primary Author

- Code consistency & reliability
- A feeling of responsibility
- An ultimate source for technical answers

The Good: Advanced Users

- Difficult but powerful software attracts talented users
- Talented users have good ideas
- Talented users have interesting problems
- Interesting problems stress-test algorithms
- Some researchers even validate their simulations

The Good: *Rendering with Radiance*

- Author wrote intro. and technical chapters
- Rob Shakespeare wrote tutorial chapters
- Other talented users wrote application chapters
  - Charles Ehrlich on Lighting Analysis
  - John Mardaljevic on Daylighting
  - Erich Phillips on Roadway Lighting
  - Peter Apian-Bennewitz on Animation

The Bad and the Ugly

- Being the primary author meant that when I left LBNL, development fragmented
  - Code branches diverged even within LBNL
  - Technical support also suffered
- Old-style C code was never updated

  (My excuse -- it still works!)
- Some code developments could be lost

Radiance 3.4: What is There

- Holodeck rendering system
- New and improved ray tracing utilities
  - **vwrays** and new **rtrace** options
- Bug fixes and improvements
  - **glrad** program for OpenGL rendering
  - **xform** -f option for faster scene generation
  - Increased max. scene complexity
  - New fonts (Verdana, Pix)

Radiance 3.4: What is Missing

- David Robertson's optimizations
  - Hooks for compiled patterns in C
  - Portability and readability improvements
  - MPI support for parallel rendering
- Windows port and additions
  - **ximage** and **rview** replacements

Open Source Development

- Open Source definition
- Open Source and *Radiance*
- How will this affect *Radiance* developers?
- How will this affect *Radiance* users?

Open Source Definition

- Free program distribution
  - Must include original source code
  - Must be free (or cost of distribution)
  - Must allow redistribution and derivative work
- Permits restriction that derivatives be patched from authors' original source
- Adds "no discrimination" clauses

Open Source and *Radiance*

- Until now, anyone wishing to redistribute any version of *Radiance* required a license
  - A two-year, renewable license cost $10000
  - Approximately 10 licenses were sold
- Beginning December 1, 2002, LBNL will make *Radiance* available as Open Source
  - Code was always available -- now you may build on it and share your additions

How Will Open Source Affect *Radiance* Developers?

- In the past, developers had to offer their patches to *Radiance* source separately -- now, they can distribute complete package
- Companies wishing to capitalize on *Radiance* may do so without a license
- Code branching may be a problem

How Will Open Source Affect *Radiance* Users?

- New versions may have new capabilities
- New products may become available
- New sources of technical expertise
- Questions may arise as to simulation integrity

The Future Is Yours

- The future of *Radiance* depends on interested users and developers
- I will continue to be involved and available for consultation at some level
- Much of the work is in derivative software applications that utilize *Radiance* core lighting & daylighting simulation engine