Radiance 4.0
Improvements

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Anyhere Software
Enhancements

- New `rvu -n` option for multiprocessing
  - Works with `rad -N`, `objview -N`
- New control variables in `rad`
- Annual simulation for complex fenestration (fancy windows)
RVU in Parallel

- Linear speed-up with number of processors
- First renderer to use raypcalls.c
- Slight delay in command response
- \(-n 1\) behavior same as before
- Process count changed via "new" command
RAD Settings

- Variables “oconv,” “mkillum” and “pfilter” may now specify alternate program path as first argument

- Variables “rpict” and “rvu” added for renderer-specific options and paths

# Use my hacked rvu with 2 CPUs:

rvu = /usr/mybin/rvuGW1 -n 2
Annual Simulations with BTDF Windows

- Development funded by LBNL and Southern California Edison
- Development work managed by Eleanor Lee at LBNL
- SCE project managed by Heschong-Mahone Group
- Lisa Heschong, Mudit Saxena, and Tim Perry
What Was Added

- Created `genklemsamp` utility to generate Klems samples for `rtcontrib`
- First Perl script in Radiance
- Added `klems_int.cal` to bin samples
- Added `reinhart.cal` for sky samples
- Created `gentregvec` utility to compute sun/sky contribution vector
- Wrote `dctimestep` matrix multiplier
Basic Steps

- **Phase I: Exterior Analysis**
  - Use `genklemsamp` with `rtcontrib` to track flux from sky to façade

- **Phase II: Interior Analysis**
  - Use `rtcontrib` to track flux from window interiors to room surfaces

- **Phase III: Time Step for each s, T**
  - Use `dctimestep` to get $i = VTDs$
Bug Fixes

- Fixed accuracy issues with new BTDF support in `mkillum`, thanks to Rick Mistrick, Maria Konstantoglou, Eleanor Lee and others at LBNL

- Improved sampling of circular and spherical sources with much help from David Geisler-Moroder

- `-dj 1` now works reliably*

*except in the case of non-parallelograms*
Round Sources

Old Sampling with -dj 1:

rpict: warning - aiming failure...
Round Sources \(^{(2)}\)

Philip Nowell map of circle to square:

\[ x' = x \sqrt{1 - \frac{y^2}{2}} \quad \text{and} \quad y' = y \sqrt{1 - \frac{x^2}{2}} \]
Round Sources (3)

New Sampling with -dj 1:

Imperfect solution, but errors are usually negligible
Round Sources (4)

Works for:
- Disk sources
- Distant sources
- Similar trick for spherical sources
- Polygonal sources unaffected
Other Changes

- Changed picture suffix convention from "pic" to "hdr" in all scripts
- Added `gendaylit` to distribution
Release 4.0 Overdue

- It’s more or less ready, just looking for time to throw it together (soon?)
- The HEAD release is fairly stable and I encourage users to send feedback