Centre for Building Performance Research

USING RADIANCE IN TEACHING 1990 to 2005

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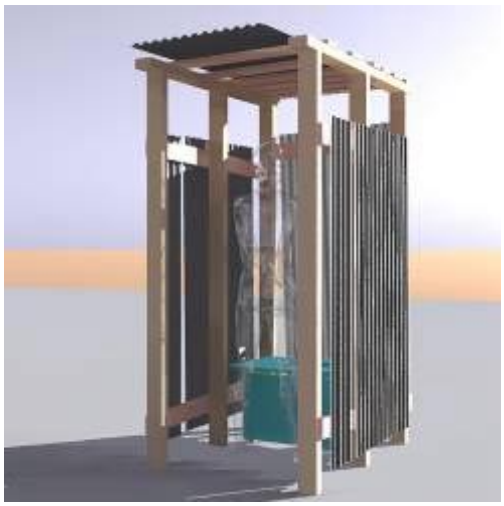
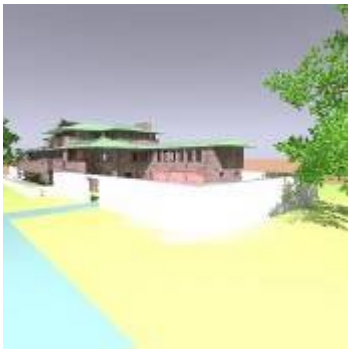
ABSTRACT
A Masters student at Victoria University, Robert Amor. now a computer scientist at Auckland University, visited LBNL during a trip overseas in 1990. He brought back with him material of interest to his Masters which formed the foundation of his work on general models of data exchange between building performance analysis computer tools. He also brought back a tape of a new lighting program. At the time the architecture year three students were building 3D models in their elective 'Computer Applications' class. Rendering was with Autoshade and its Renderman shaders. Rendering was a last minute extra for most students. As early as 1991, the capable students were encouraged to experiment with this alternative 'renderer' called Radiance.

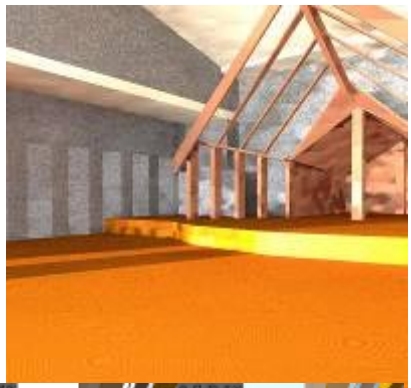


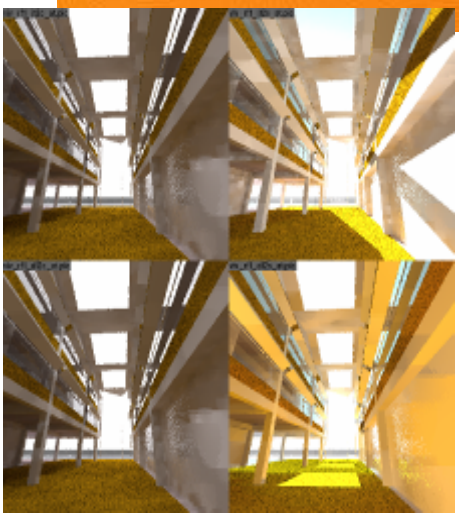
With the Robert's assistance, one architecture student, David Chambers, succeeded in using Radiance, on a small file that we helped him to convert from AutoCAD. The corrugated iron was in fact drawn as corrugated in AutoCAD. The CAD 'person' added to this elegant little 'dunny' in the desert was imported into the file.

Already the split that has been observable since in the behaviour of students involved in modeling and rendering classes was apparent: first, those who tried to understand why a program behaved the way it did and who tended to understand sufficient to push the limits; and second, those for who were limited by their own expectations of what they saw as a 'training course' in Computer Aided Drafting, to assist them to get jobs.



Successive classes were set as core requirements the use of Radiance for rendering. A building science honours student – Kath Davies – in 1992 produced an AutoCAD model and the Radiance image of Frank Lloyd's Robie house on the left. She was one of the few people for a number of years to gain any mastery of cal files (see the brick material and the trees!). Again Robert was the key.





In the next couple of years we experimented with using the software for consultancy. On the Museum of New Zealand – te Papa Tongarewa – we ran most of the Sun computers in the university over the whole Christmas break to examine solar access from the sunlit circulation spaces to the adjacent galleries. This was our first (and almost our last) successful use of timber / wood as a Radiance material).

One of our Architecture graduates worked for a couple of weeks making a model of the as yet unbuilt new school of architecture building. This second project allowed us to examine a series of design alternatives for the glazing of the roof of the planned atrium. The daylight study supplemented the study of the solar heating potential of the same space.

This presentation uses students' own comments to illustrate the impact front end usability tools since those early experiments. Today at the Victoria School Radiance analysis is routinely used in 2nd year Building Science introductory lighting Classes; in 3rd and 4th year Architecture and Building Science lighting classes; and in 3rd year rendering classes.