

MANY CHEERFUL FACTS

presents

The Metropolis Light Transport Algorithm

a talk by Matthias Görner

1:10 pm - 2:00 on Wednesday, November 30th, in room
891.

In 1953, Nicholas Metropolis wanted to approximate some specific quantities in a thermodynamical system and gave a remarkable easy algorithm which can be generalized and used for many other application. In the talk I will explain the Metropolis algorithm and why and how it can be used to render computer generated images.

This is possible because the rendering problem can be formulated as an integral over the space of all possible paths of a light ray. It then shares the same core than Metropolis' original problem: averaging a quantity over a huge space (originally configuration space, here path space) where picking a sampling point blindly will almost always result in a point of negligible weight. See how to pick the sampling points more cleverly (the last phrase implies that I will also show some actual pictures).

*I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!*

- Gilbert & Sullivan *P o P*