



Ray Tracing for Light and Radio Wave Simulations

By Arne Schmitz

Shaker Verlag Dez 2012, 2012. Taschenbuch. Condition: Neu. Neuware - Being able to simulate the propagation of light waves and radio waves is very important in many areas of research, industry as well as the public sector. Both the visible light and radio waves share properties that seem wave-like, such as a wavelength or frequency, but at the same time they also appear particle like. Both kinds of waves are made up from the same particles, photons. For both high frequency radiation and visible light, certain basic optical laws do apply that can be used in the modeling of a simulation. In this thesis, we concentrate on methods using geometrical optics to simulate the propagation of visible light and radio waves. We present two new propagation simulation algorithms based on the extension and adaptation of recent techniques for global illumination simulation. By combining and improving these highly efficient algorithms from the field of Computer Graphics, it is possible to build a fast and flexible utility to be used for wireless network simulation. Instead of the wave nature of EM radiation we rather use the particle nature of waves to compute a discrete sampling of the volumetric electromagnetic field by tracing...



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