Parallel Monte Carlo Sampling Scheme for Sphere and Hemispheres*

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Abstract: The sampling of a solid angle in a fundamental sphere can be performed by sampling a random point on a sphere and then determining the solid angle subtended at the origin between the normal to that point and the normal to the sphere. This technique can be extended to sampling a solid angle in a fundamental hemisphere by sampling a random point on a hemisphere and determining the solid angle subtended at the origin between the normal to that point and the normal to the hemisphere.

The Parallel Monte Carlo Algorithm for Integration of the Rendering Equation


Abstract: The rendering equation is the fundamental equation in computer graphics that describes the illuminance distribution at a point in a scene. It relates the illuminance of a surface to the light sources that illuminate the surface, the material properties of the surface, and the surface geometry. The rendering equation is a system of integral equations, each of which represents a different set of variables. The rendering equation is often solved using Monte Carlo methods, which are based on random sampling of the integrals.

The Bicubic Interpolation Scheme for the Rendering Equation

I. T. Booze, R. L. McCool, and S. K. Kulasekara

Abstract: The bicubic interpolation scheme is a method for approximating the light distribution at a point in a scene. It is based on interpolating the illuminance values at the corners of a square in the scene. The bicubic interpolation scheme is used to approximate the light distribution at a point in a scene, which is then used to determine the illuminance of a surface at that point. The bicubic interpolation scheme is a popular method for approximating the light distribution in computer graphics.

Analysis of Pseudo-Random Properties of Nonlinear Congruential Generators with Power of Two Modulus by Numerical Computing of the b-adic Diaphony

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Abstract: The analysis of pseudo-random properties of nonlinear congruential generators with power of two modulus is an important aspect of modern cryptography and computer science. The b-adic diaphony is a measure of the randomness of a sequence of numbers. The analysis of the b-adic diaphony is performed by numerical computing of the b-adic diaphony for various modulus values.

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