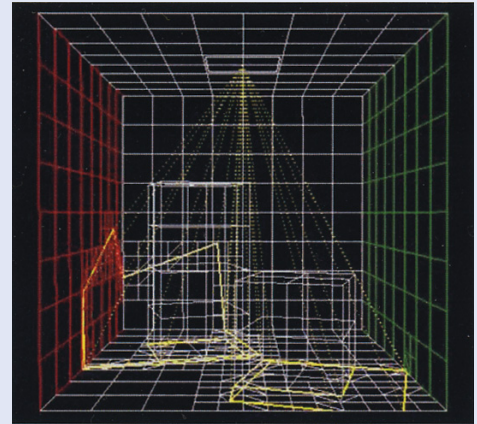


Japanese Patent No. 3018151

## Three-Dimensional Graphic Data Processing Method and Apparatus

Invented by: *ARAKAWA Yoshiki*

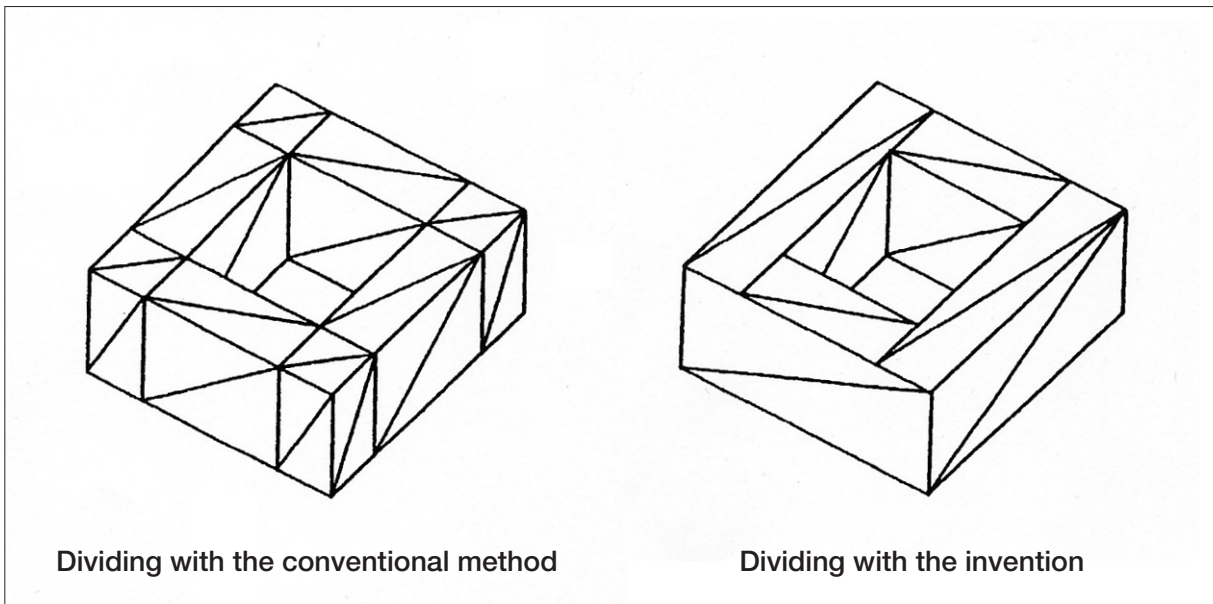


*Radiosity CG using a super-geometric model (Photo: OptoGraph, Inc.)*

### Technology in Brief

Most conventional methods of processing polygonal data have several disadvantages: large-scale calculation systems are required, reliability is low, and processing speeds are slow.

This invention represents a three-dimensional shape using a collection of numerous triangles. Each triangle has a side having three points—two apexes of its own and one apex of the adjacent triangle. The processing of shape data is carried out by a novel "super-triangle graphic processing" technique that handles various shapes based on the data on triangles and three-point sides. Then the triangle data can be processed with high efficiency and speed without sacrificing the simple triangle shape or data structure. The technique developed minimizes the size of triangle data and allows high-speed handling of three-dimensional graphic data.



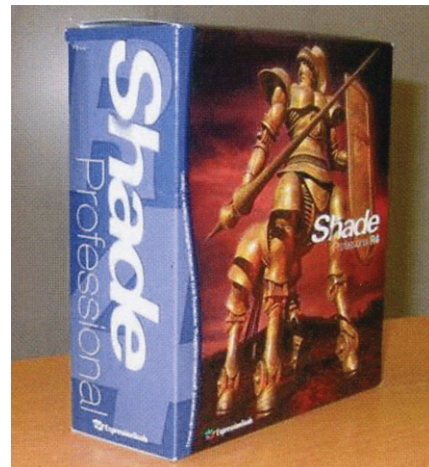
Dividing with the conventional method

Dividing with the invention

## High Quality, High Speed Radiosity (Simulated Light Space)

The radiosity method, which provides a realistic 3D CG (computer graphics) space, calculates the physical behavior of light (reflection, diffusion, mirroring, shading, etc.) using a mathematical model computers can easily handle. By simulating the behavior of indirect light, users can generate computer graphics that realistically depict a three-dimensional space. Conventional radiosity software requires lengthy data processing; in addition, formidable expertise is required to make the appropriate parameter settings.

It is now possible to provide 3D CGs offering both higher quality and processing speeds severalfold faster.



The invention is incorporated into the radiosity function of the "Shade" CG software program sold by Expression Tools, Inc.

## Commercialization

Using this super-triangle geometric technique, the radiosity software calculates the effects of light diffusion and reflection and produces attractive 3D images, with indirect illumination providing soft, beautiful, realistic images. This radiosity technology has been commercialized by OptoGraph, Inc. and embedded into the "Shade" professional CG software program (sold by Expression Tools, Inc.).



CG by super-triangle radiosity  
Photo: OptoGraph, Inc.

Patents Obtained by CRL may be used for a fee. Please contact CRL Intellectual Property Group for information on patent licensing and technical data.