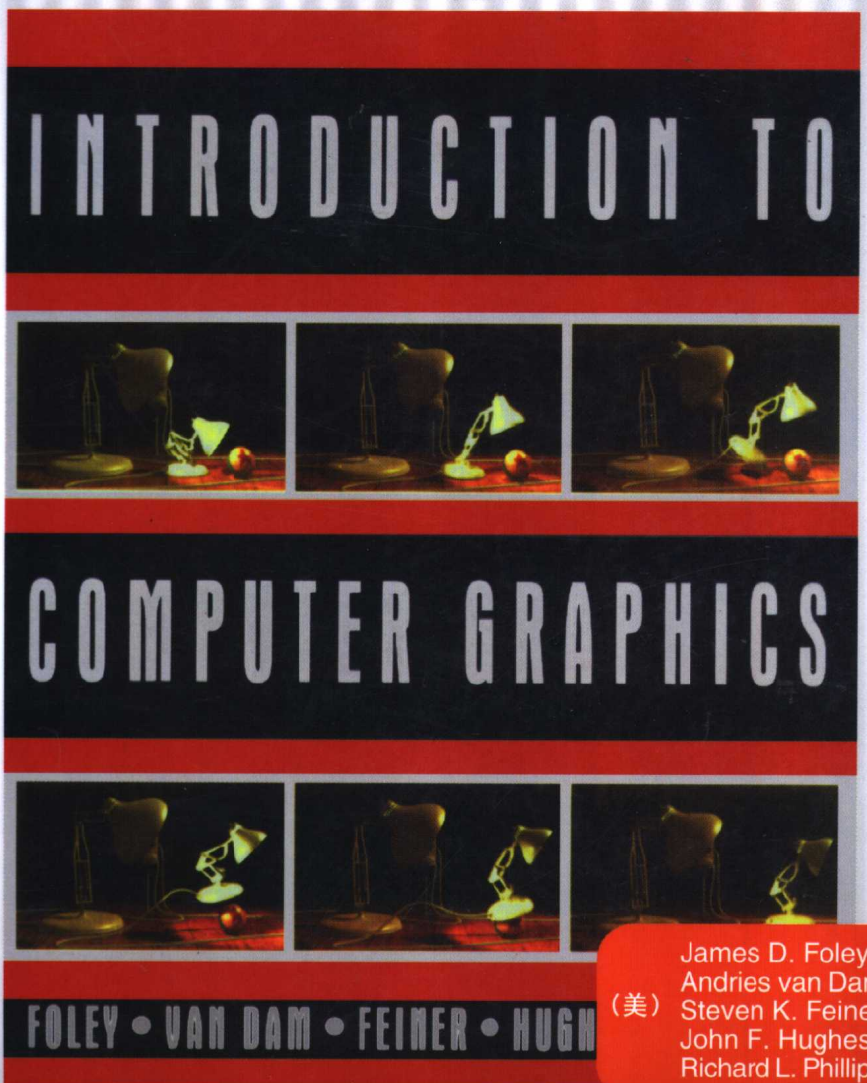
HZ BOOKS

PEARSON Addison Wesley

经 典 原 版 书 库

计算机图形学导论

（英文版）



（美）James D. Foley
Andries van Dam
Steven K. Feiner
John F. Hughes
Richard L. Phillips 著

机械工业出版社
China Machine Press

经典原版书库

计算机图形学导论

（英文版）

Introduction to Computer Graphics

James D. Foley
Andries van Dam
(美) Steven K. Feiner 著
John F. Hughes
Richard L. Phillips

机械工业出版社
China Machine Press

本书版权登记号：图字：01-2002-8101

图书在版编目（CIP）数据

计算机图形学导论（英文版）/（美）福利（Foley, J. D.）等著. －北京：机械工业出版社，2004.1

（经典原版书库）

书名原文：Introduction to Computer Graphics

ISBN 7-111-13413-3

Ⅰ.计… Ⅱ.福… Ⅲ.计算机图形学－英文 Ⅳ.TP391.41

中国版本图书馆CIP数据核字（2003）第104984号

机械工业出版社（北京市西城区百万庄大街22号 邮政编码 100037）

责任编辑：迟振春

北京昌平奔腾印刷厂印刷·新华书店北京发行所发行

2004年1月第1版第1次印刷

787mm×1092mm 1/16·38 印张（彩插1.25印张）

印数：0 001- 3 000 册

定价：59.00 元

凡购本书，如有倒页、脱页、缺页，由本社发行部调换

本社购书热线电话：(010) 68326294

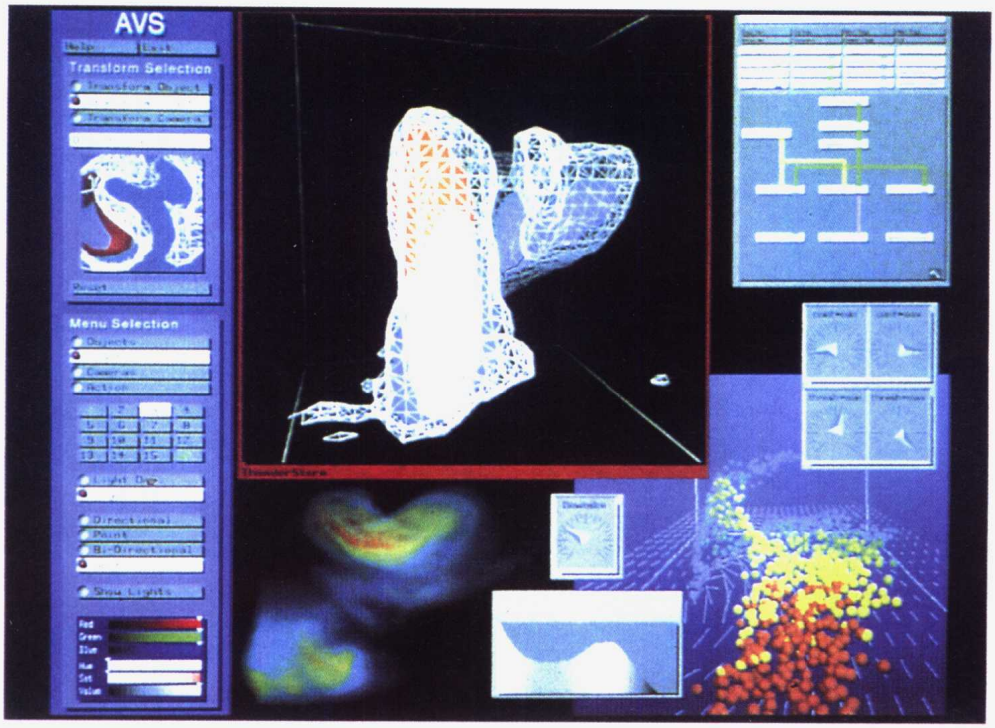


Plate 1. Severe tornadic storm, by R. Wilhelmson, L. Wicker, and C. Shaw, NCSA, University of Illinois. (Application Visualization System by Stardent Computer.)

Plate 2. *The Abyss* — Pseudopod sequence. (Copyright © 1989 Twentieth Century Fox. All rights reserved. Courtesy of Industrial Light & Magic, Computer Graphics Division.)

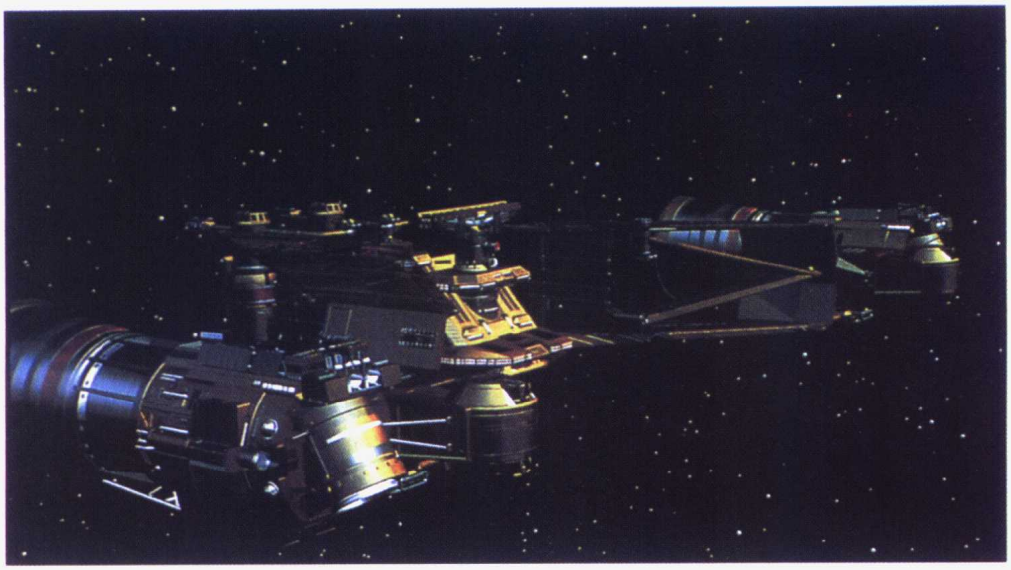


Plate 3. Command ship from *The Last Starfighter.* The texture-mapped ship has 450,000 polygons. (Copyright © 1984 Digital Productions. Courtesy of G. Demos.)

(a)

(b)

Plate 4. (a) The cockpit of an F5 flight simulator; the pilot's view is projected onto a dome surrounding the cockpit. (b) The view from the cockpit of the flight simulator. The fighter jet is modeled geometrically, whereas the terrain is photo-textured. (Courtesy of R. Economy, General Electric Company.)

Plate 5. *Hard Drivin'* Arcade video game. (Courtesy of Atari Games Corporation, copyright © 1988 Atari Games Corporation.)

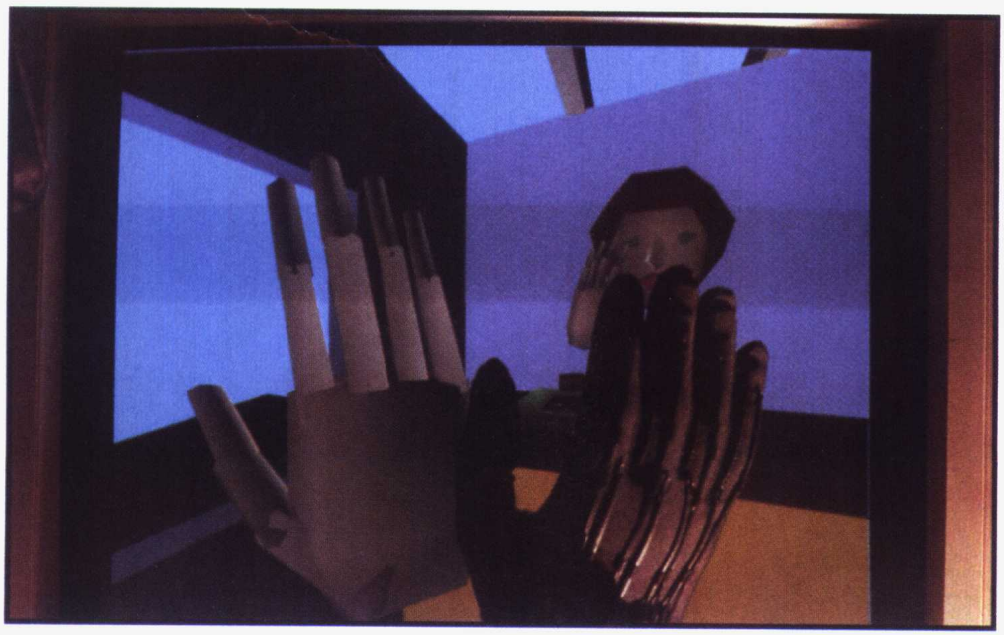


Plate 6. A DataGlove (right) and computer image of the glove. The DataGlove measures finger movements and hand orientation and position. The computer image of the hand tracks the changes. (Courtesy of Jaron Lanier, VPL.)

Plate 7. A User wearing a head-mounted stereo display, DataGloves, and microphone for issuing commands. These devices are used to create virtual reality for the user, by changing the stereo display presentation as the head is moved, with the DataGloves used to manipulate computer-generated objects. (Courtesy of Michael McGreevey and Scott Fisher, NASA Ames Research Center, Moffett Field, CA.)

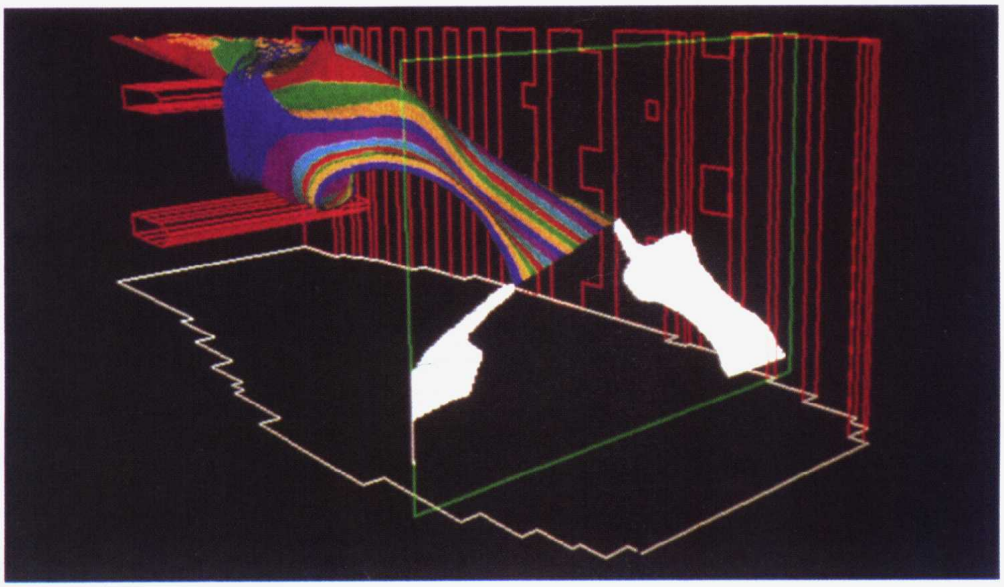


Plate 8. Krueger's Videotouch system, in which a user's hand movements are used to manipulate an object. The hand's outlines are displayed along with the objects to provide natural feedback. (Courtesy of Myron Krueger, Artificial Reality Corp.)

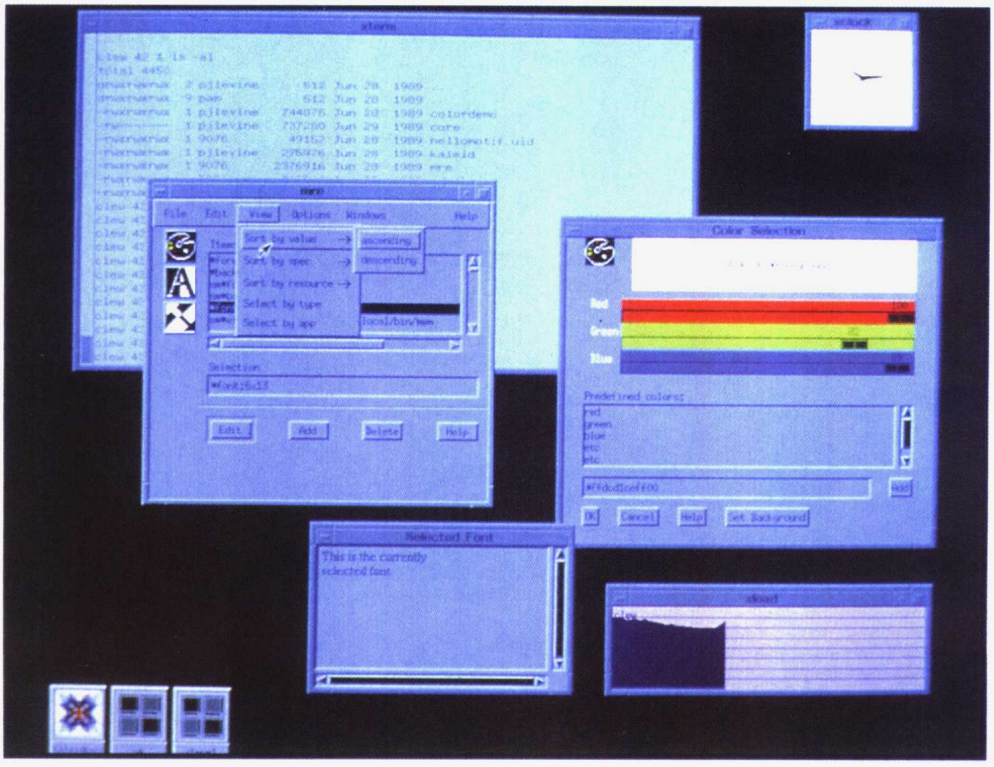


Plate 9. The OSF/Motif user interface. The color slider bars are used to define colors for use in windows. Notice the use of shading on the edges of buttons, menus, and so forth, to create a 3D effect. (Courtesy of Open Software Foundation.)

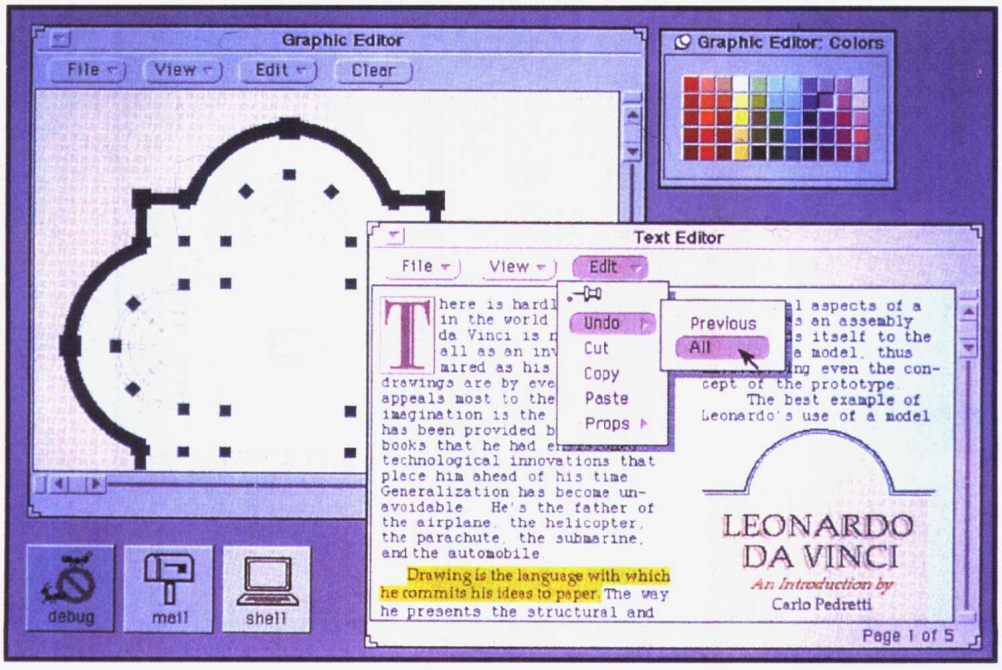
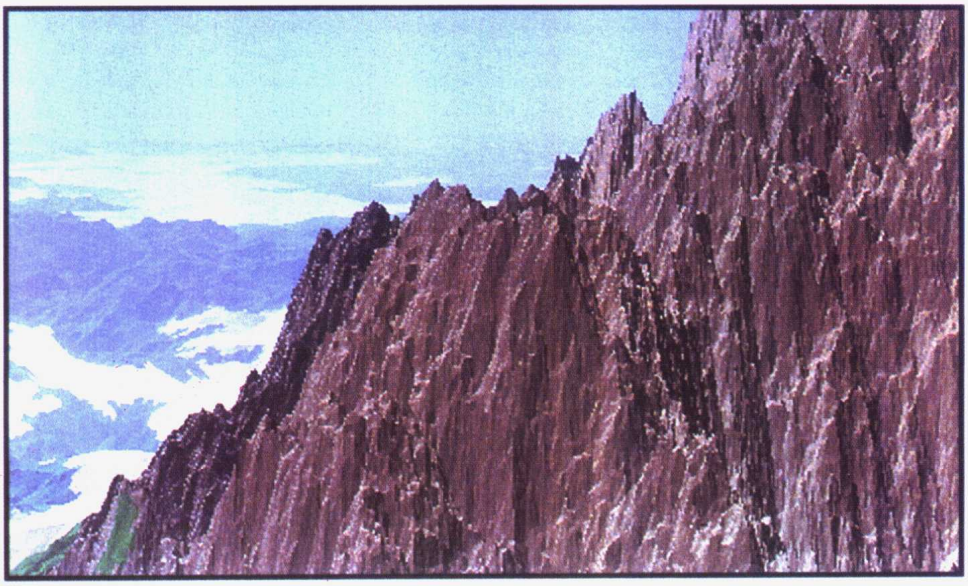


Plate 10. The OPEN LOOK user interface. Yellow is used to highlight selected text. Subdued shades are used for the background and window borders. (Courtesy of Sun Microsystems.)



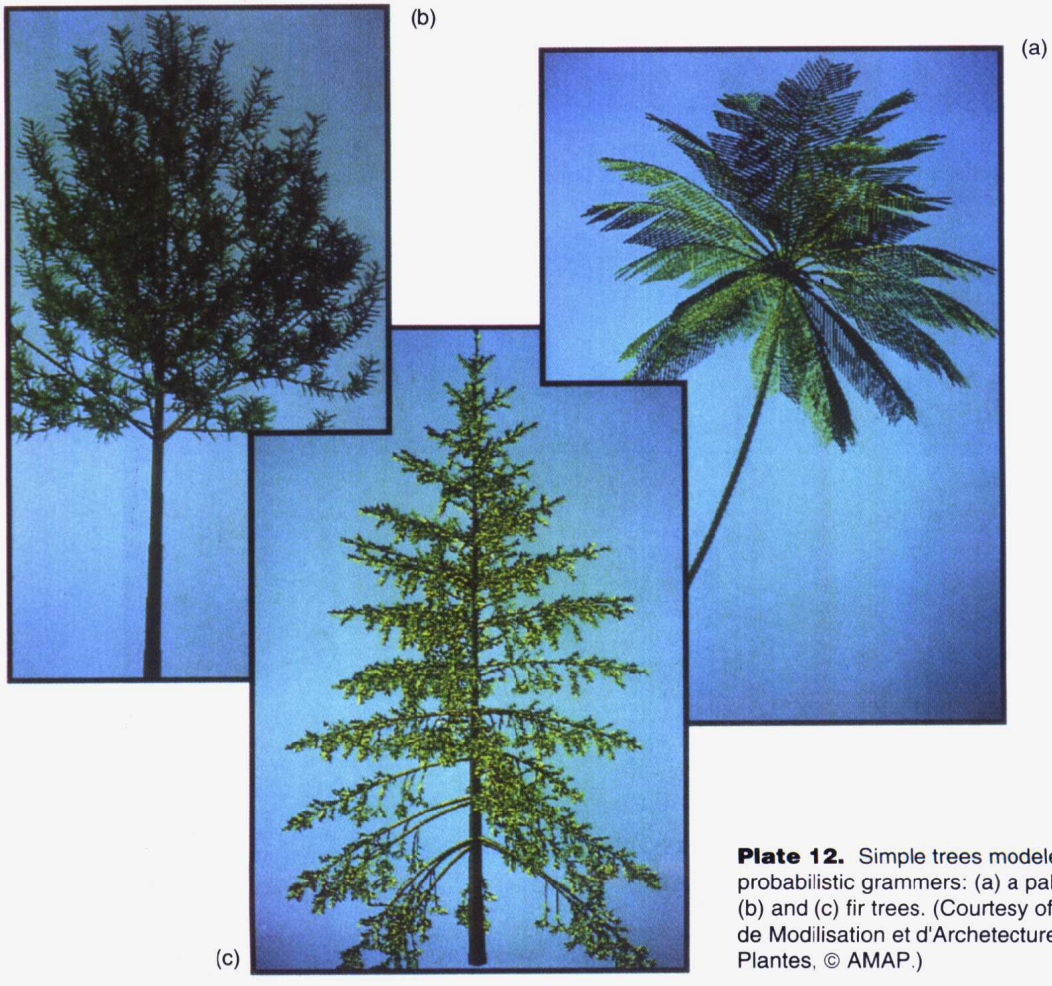


Plate 12. Simple trees modeled using probabilistic grammers: (a) a palm tree; (b) and (c) fir trees. (Courtesy of Atelier de Modilisation et d'Archetecture des Plantes, © AMAP.)

Facing Page: **Plate 11.** "Vol. Libre Ridge": Fractal mountains generated with the Fournier-Fussell-Carpenter algorithm. (Courtesy of Loren Carpenter.)

Plate 13. A beach at sunset. (Courtesy of Bill Reeves, Pixar, and Alan Fournier, University of Toronto.)

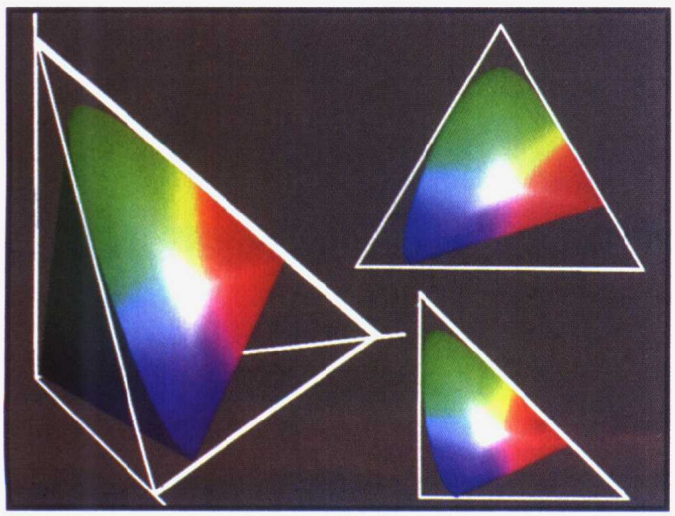


Plate 14. Several views of the $X+Y+Z=1$ plane of CIE space. Left: the plane embedded in CIE space. Top right: a view perpendicular to the plane. Bottom right: the projection onto the (X,Y) plane (that is, the $Z=0$ plane), which is the chromaticity diagram. (Courtesy of Barbara Meier, Brown University.)

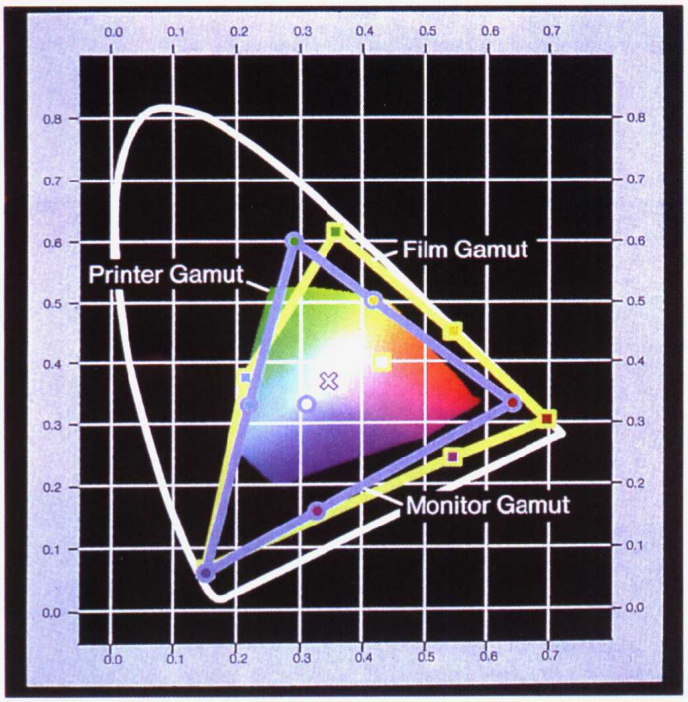


Plate 15. The CIE chromaticity diagram, showing typical color gamuts for an offset printing press, a color monitor, and for slide film. The print colors represent the Graphic Arts Technical Foundation S.W.O.P. standard colors measured under a graphic arts light with a color temperature of 5000° K. The color monitor is a Barco CTVM 3/51 with a white point set to 6500° K. and the slide film is Kodak Ektachrome 5017 ISO 64 as characterized under CIE source A: a 2653° K. black body that closely approximates a Tungsten lamp. The x, circle, and square indicate the white points for the print, color monitor, and film gamuts, respectively. (Courtesy of M. Stone, Xerox Palo Alto Research Center. Film gamut measured by A. Paeth, Computer Graphics Lab, University of Waterloo: see also the first appendix of [PAET89]).

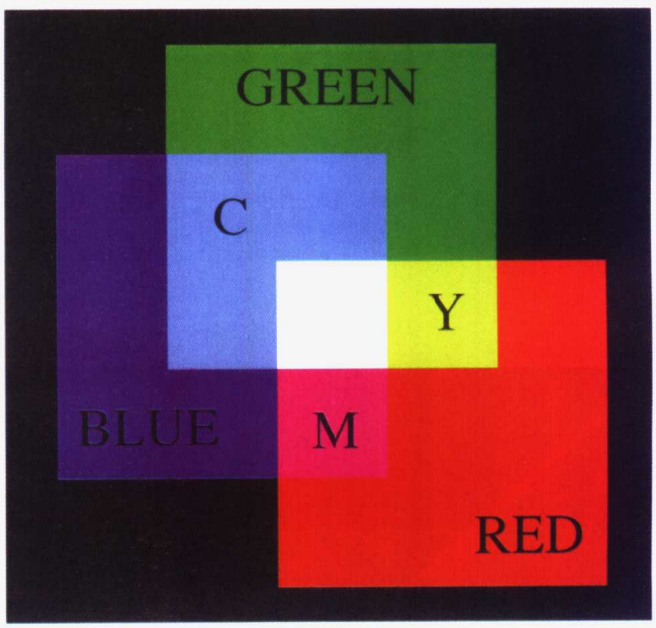


Plate 16. Additive colors. Red plus green form yellow, red plus blue form magenta, green plus blue form cyan, red plus green plus blue form white.

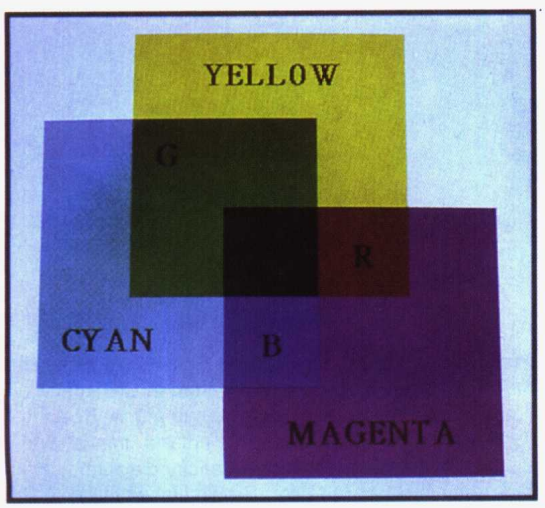
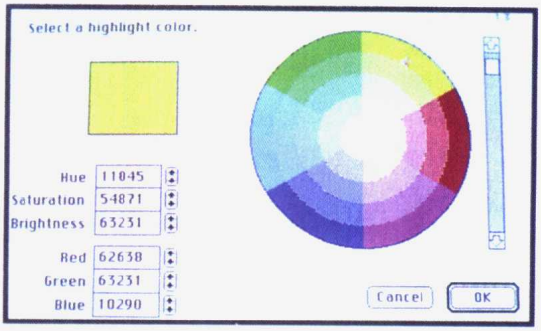


Plate 17. Subtractive colors. Yellow and magenta subtracted from white form red, yellow and cyan subtracted from white form green, cyan and magenta subtracted from white form blue.

Plate 18. An interaction technique used on the Macintosh to specify colors in the HSV space. Hue and saturation are shown in the circular area, and the value by the slider dial. The user can move the mark in the circular area and change the slider dial, or can type in new HSV or RGB values. The square color area (upper left) shows the current color and the new color.



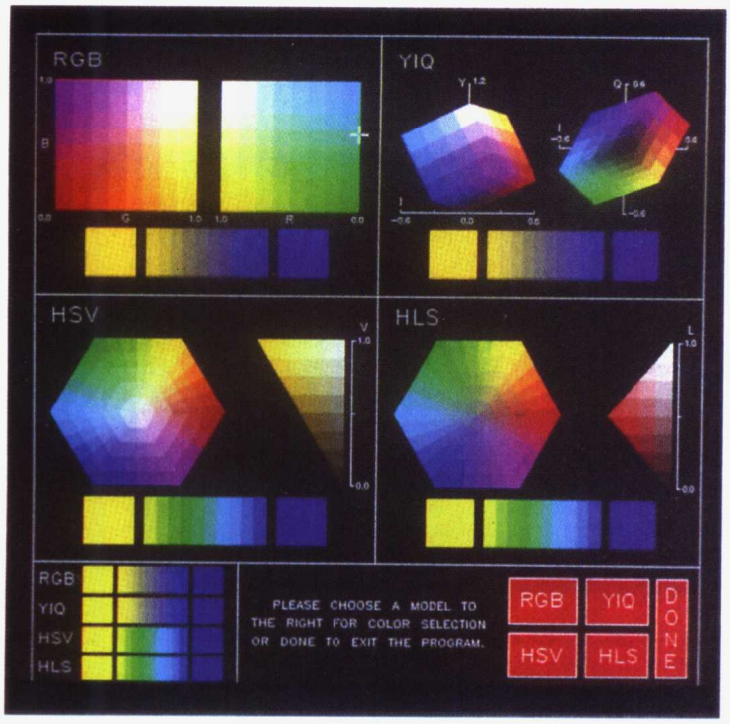


Plate 19. An interactive program that allows the user to specify and interpolate colors in four different color spaces: RGB, YIQ, HSV, and HLS. The starting and ending colors for a linear interpolation are specified by pointing at the various projections of the color spaces. The interpolation is shown below each color space, and together for comparison in the lower left. (Courtesy of Paul Charlton, The George Washington University.)

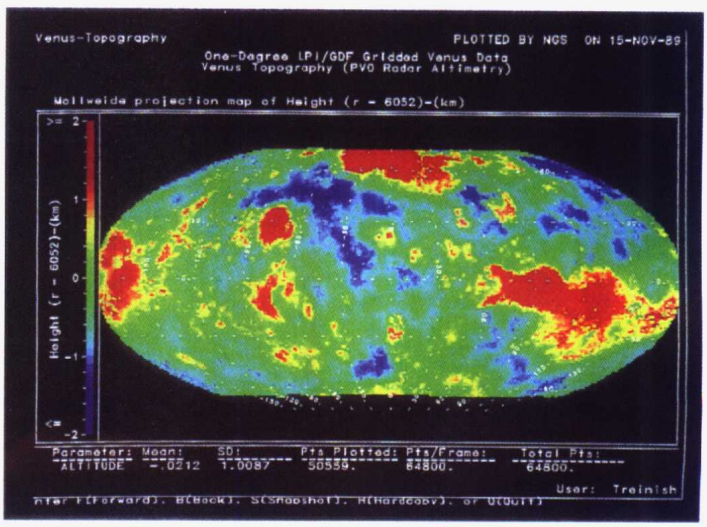


Plate 20. A pseudo-color image showing the topography of Venus. The color scale on the left indicates altitudes from -22 km to +2 km above or below an average radius for Venus of 6052 km. Data were calculated by the Lunar and Planetary Institute from radar altimetry observations by NASA's Pioneer Venus Orbiter spacecraft. The image was created with the National Space Science Data Center Graphics System. (Courtesy of Lloyd Treinish, NASA Goddard Space Flight Center.)

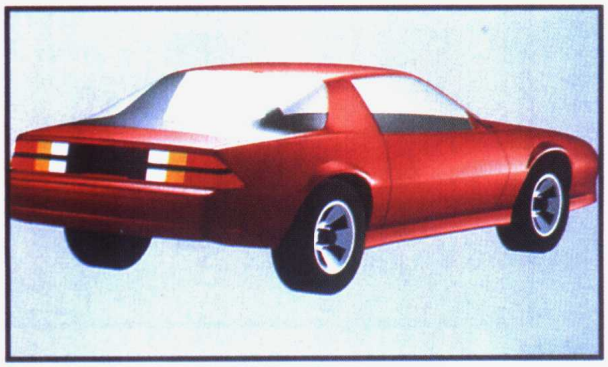


Plate 21. Chevrolet Camaro lit by five lights with Warn's lighting controls. (Courtesy of David R. Warn, General Motors Research Laboratories.)

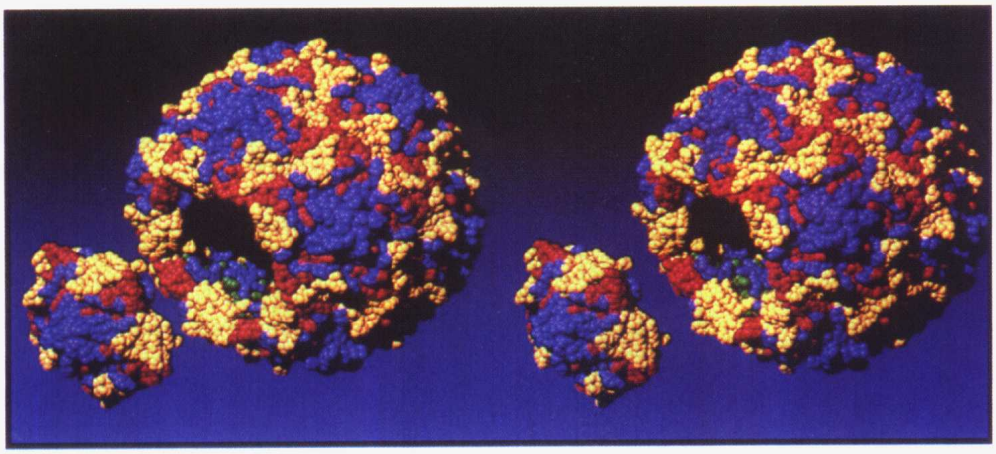


Plate 22. Stereo pair of Polio virus capsid, imaged by placing a sphere of 0.5 nm radius at each alpha carbon position. One pentamer is removed to reveal the interior. Coordinates courtesy of J. Hogle. (Courtesy of David Goodsell and Arthur Olsen. Copyright © 1989, Research Institute of Scripps Clinic.)

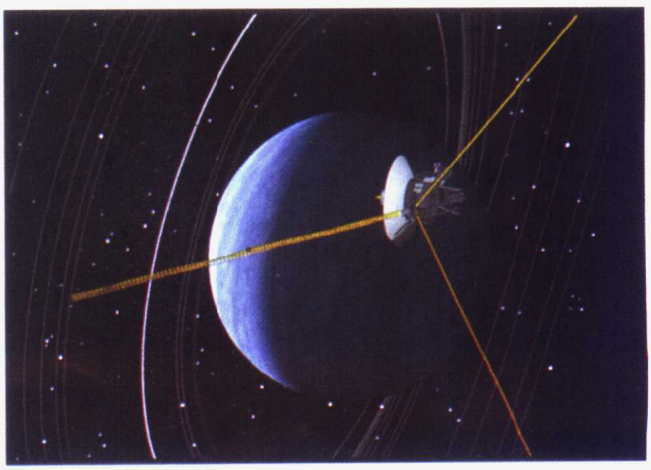


Plate 23. Simulated flyby of Uranus with rings and orbit. (Courtesy of Jim Blinn, Computer Graphics Lab, Jet Propulsion Lab, California Institute of Technology.)

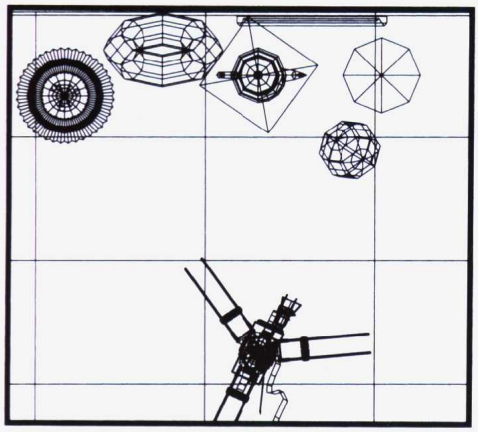
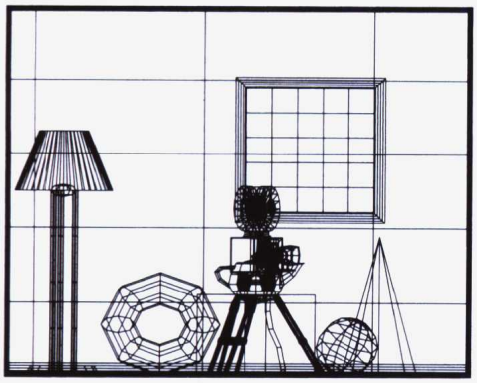
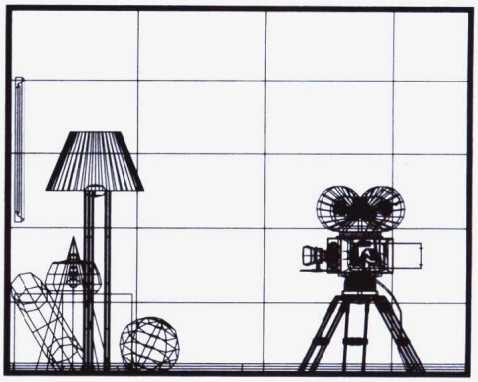


Plate 24. *Shutterbug.* Living room scene with movie camera. Orthographic projections (Sections 6.2.2 and 12.3.1). (a) Plan view. (b) Front view. (c) Side view. Polygonal models generated from spline patches. (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

(a)

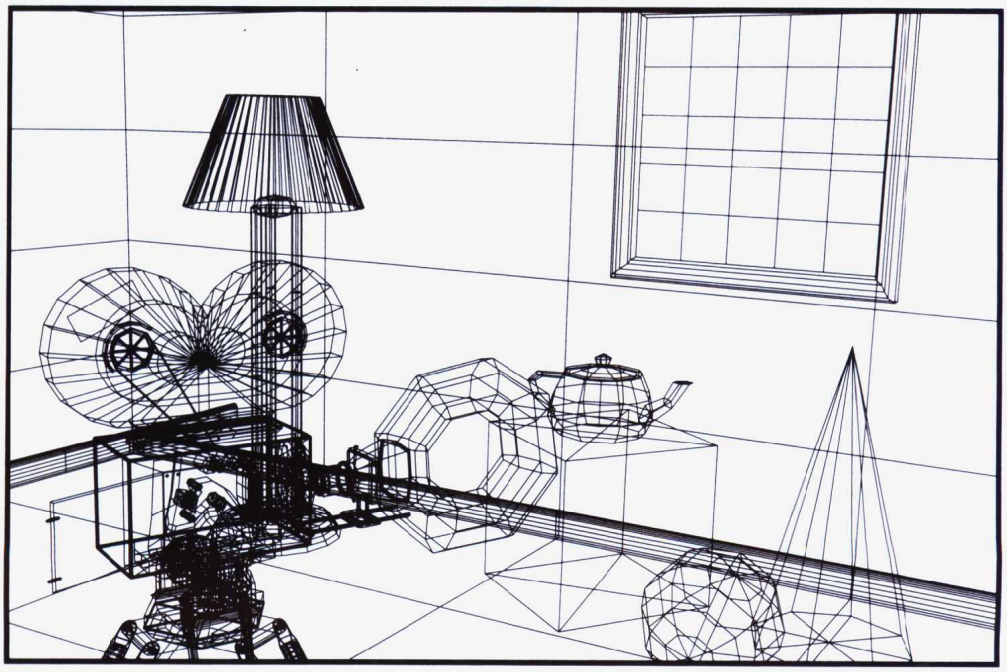


(b)



(c)

Plate 25. *Shutterbug.* Perspective Projection (Sections 6.2.1 and 12.3.2).Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)



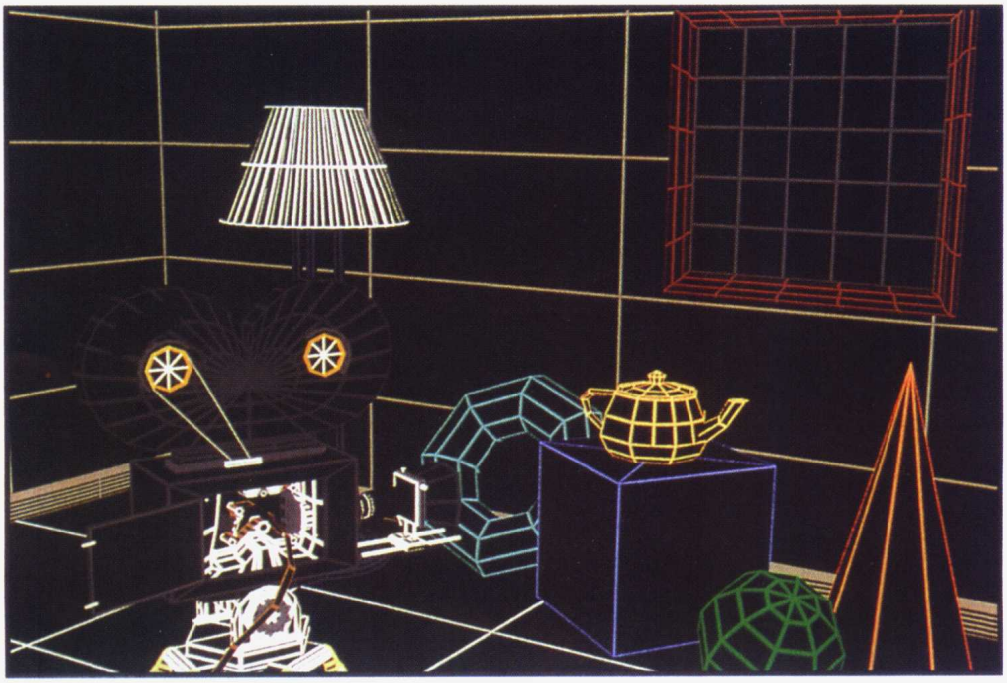


Plate 26. *Shutterbug.* Visible-line determination (Section 12.3.7). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

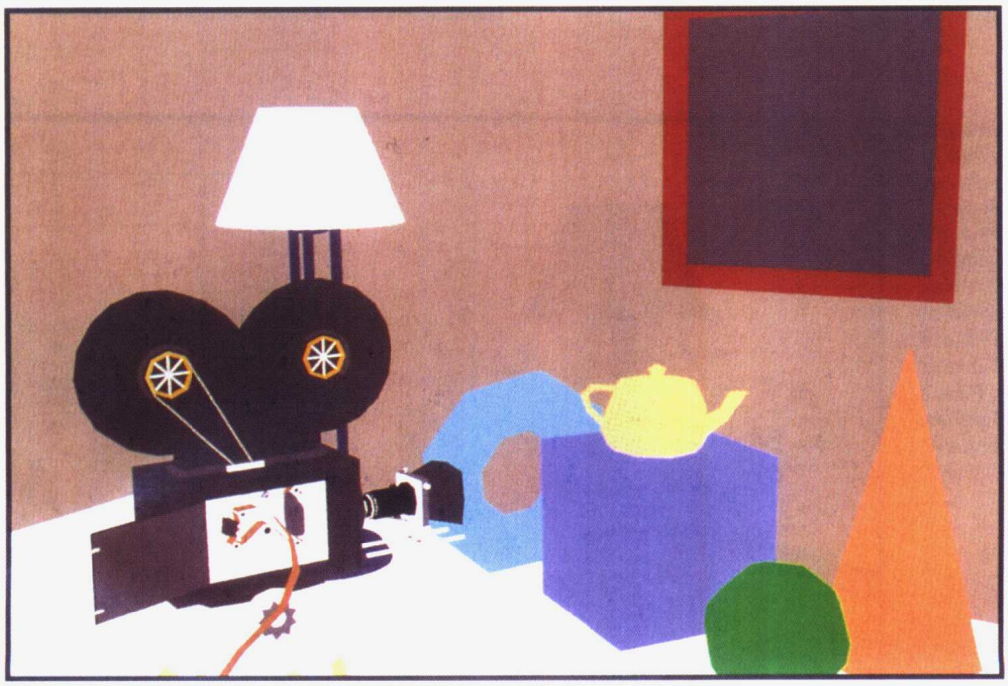


Plate 27. *Shutterbug.* Visible-surface determination with ambient illumination only (Sections 12.4.1 and 14.1.1). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

Plate 28. *Shutterbug.* Individually shaded polygons with diffuse reflection (Sections 12.4.2 and 14.2.3). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

Plate 29. *Shutterbug.* Gouraud shaded polygons with diffuse reflection (Sections 12.4.2 and 14.2.3). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

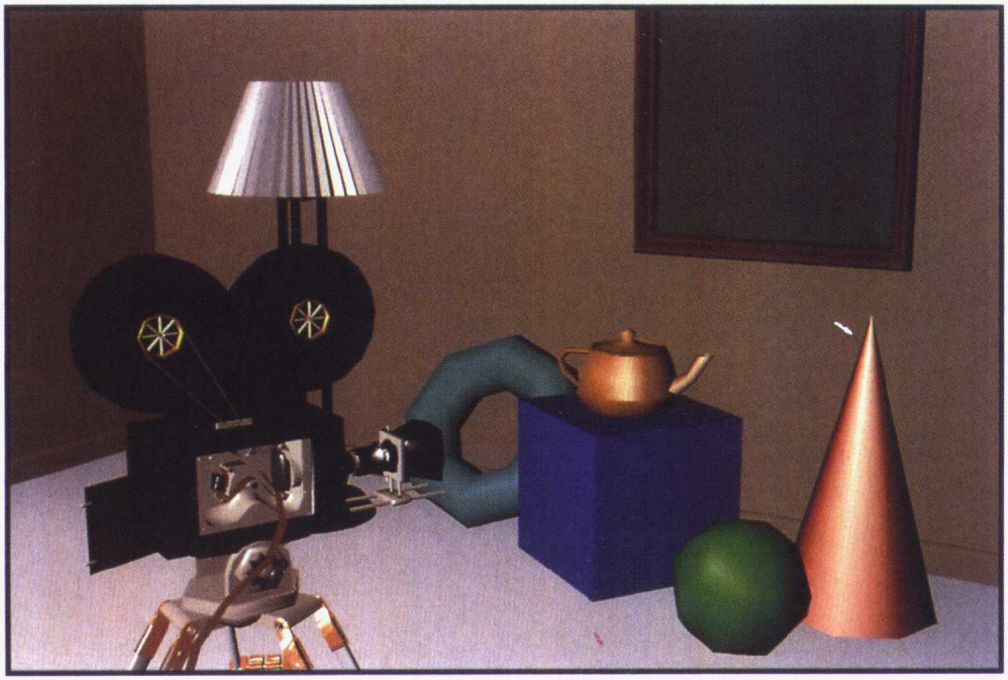


Plate 30. *Shutterbug.* Gouraud shaded polygons with specular reflection (Sections 12.4.4 and 14.2.4). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)

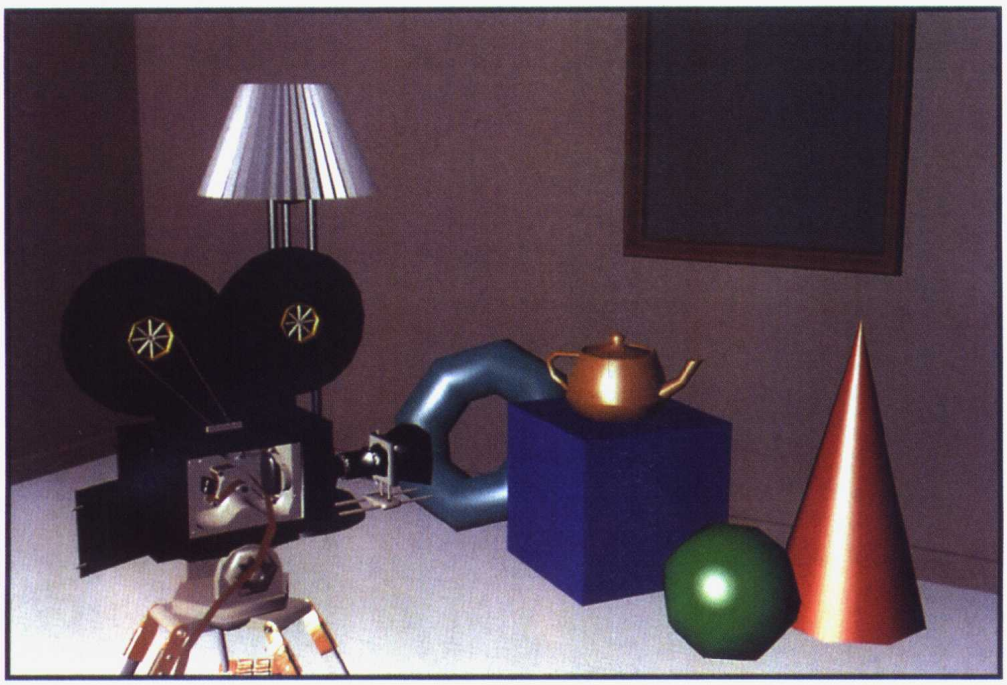


Plate 31. *Shutterbug.* Phong shaded polygons with specular reflection (Sections 12.4.4 and 14.2.5). (Copyright © 1990, Pixar. Rendered by Thomas Williams and H.B. Siegal using Pixar's PhotoRealistic Renderman™ software.)