THEME FEATURES

Cover: Computer rendering of woodcut print by ukiyo-e artist Hokusai. Generated by members of the Kunii Laboratory of Computer Science at the University of Tokyo. See “About the Cover” on page 7.

Cover design: Jay Simpson

8 Guest Editor’s Introduction: Computer Graphics in Japan—Part 2
Tosiyasu L. Kunii

11 A 3-D Graphics Display System with Depth Buffer and Pipeline Processor
Akira Fujimoto, Christopher G. Perrott, and Kansei Iwata
Capable of displaying 10,000 polygons per second, this interactive terminal produces smooth, color-shaded surfaces quickly for applications in science, engineering, training simulation, and animation.

24 A Unified Algorithm for Boolean Shape Operations
Fujio Yamaguchi and Toshiya Tokieda
Most algorithms for Boolean shape operations are complicated, slow, and of limited applicability. This one, based on a triangulation of potentially intersecting faces, is relatively fast and simple.

38 Formgraphics: A Form-Based Graphics Architecture Providing a Database Workbench
Hiroyuki Kitagawa, Tosiyasu L. Kunii, Motoei Azuma, and Sohei Misaki
Complex combinations of text, graphics, and alphanumeric strings can be manipulated easily and rapidly when displayed in screen formats similar to conventional hard-copy forms.

58 Geomap-III: Designing Solids with Free-Form Surfaces
Fumihiko Kimura
In advanced CAD/CAM applications, designers need the capability of modeling solid objects with complex surfaces. This geometric modeler incorporates new techniques to combine design functions.

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