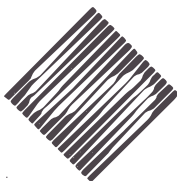


ACM SIGGRAPH VIDEO REVIEW



ISSUE 86

ACM SIGGRAPH '92
Video Supplement to the
Conference Proceedings

Table of Contents

1. **Scheduled Fourier Volume Morphing** - *Brown University*
2. **Shape Transformation for Polyhedral Objects** - *ACCAD/OSU*
3. **Surface Reconstruction from Unorganized Points** -
Hugues Hoppe
4. **Smoothing Polyhedra with Implicit Algebraic Splines** -
Purdue University
5. **Pump It Up: Computer Animation of a Biomechanically
Based Model of Muscle Using the Finite Element Method**
- *MIT Media Lab*
6. **A Simple Method for Extracting the Natural Beauty of
Hair** - *Hitachi, Ltd.*
7. **Variational Surface Modeling** - *William Welch, Andrew Witkin*
8. **Direct Manipulation of Free-Form Deformations** - *DEC*
9. **Surface Modeling with Oriented Particle Systems** - *DEC*
10. **High Resolution Virtual Reality** - *Sun Microsystems*
11. **Sound Rendering** - *The George Washington University*
12. **An Algorithm with Linear Complexity for Interactive,
Physically-Based Modeling of Large Proteins** - *Surles*
13. **Interactive Spacetime Control for Animation** - *Cohen*
14. **Through-the-Lens Camera Control** - *CMU*

Video Paper

15. **Using Deformations to Explore 3D Widget Design** - *Brown University Computer Graphics Group*
16. **Interactive Inspection of Solids: Cross-Sections and Interferences** - *IBM T.J. Watson Research Center*

Most of the pieces in this SIGGRAPH Video Review are copyrighted. Therefore, they are not to be duplicated, broadcast, photographed or edited without express permission of the individual copyright holder.

ACM SIGGRAPH Video Review

Issue 86

ACM SIGGRAPH '92
Video Supplement to the
Conference Proceedings

1 . Scheduled Fourier Volume Morphing

Produced by:

John F. Hughes, Brown University

Sponsor:

Supported in part by the NSF/DARPA Science and Technology Center for Computer Graphics and Scientific Visualization, and by IBM, NCR, DEC, SUN and HP

Copyright:

© 1991 by John F. Hughes

Hardware:

Sun SPARCstation

Software:

Renderman

Contact:

John F. Hughes
Brown University
Department of Computer
Science
Box 1910
Providence, RI 02912
(01) 401-863-7638
(01) 401-863-7657 fax

For information regarding the purchase of SIGGRAPH Video Review tapes, contact:

**SIGGRAPH Video Review
c/o 1st Priority
P.O. Box 576
Itasca, Illinois 60143-0576**

**Within USA: 800-523-5503
Outside USA: 708-250-0807
FAX: 708-250-0038**

2. Shape Transformation for Polyhedral Objects

Produced by:

James R. Kent, Wayne E. Carlson, Richard E. Parent, Kevin M. Rodgers

Summary:

The video illustrates the capabilities of the shape transformation algorithm described in the paper "Shape Transformation for Polyhedral Objects."

Copyright:

© 1992 by ACCAD/ The Ohio State University

Hardware:

SUN SLC SPARCstation

Software:

Custom Transformation and Rendering Software

Contact:

James R. Kent
The Ohio State University
7368 Cimmaron Station
Drive
Columbus, OH 43235
(01) 614-889-2750
(01) 614-292-7776 fax

3. Surface Reconstruction from Unorganized Points

Summary:

Illustrates method presented in SIGGRAPH '92 Paper

Hardware:

HP 9000-835

Software:

Starbase

Contact:

Hugues Hoppe
University of Washington
Department of Computer
Science and Engineering
FR-35
Seattle, WA 98195
(01) 206-543-5118
(01) 206-543-2969 fax

4. Smoothing Polyhedra with Implicit Algebraic Splines

Produced by:

Chandrajit L. Bajaj, Insung Ihm, V. Anupam, A. Royappa, D. Schikore, R. Pradhan

Summary:

Polyhedral approximations of physical models are smoothed by C' algebraic splines. This algorithm has been implemented in the SHASTRA distributed and collaborative design environment. Several processes are invoked (one per face of the polyhedron) to build the C' algebraic spline in a fully distributed manner.

Copyright:

© 1992 by Purdue University

Hardware:

Silicon Graphics IRIS 4D-35,
Sun SPARCstation

Software:

The SHASTRA Distributed and Collaborative Design Environment (In house), X-11 windows, GL graphics library

Contact:

Chandrajit L. Bajaj
Computer Science
Department
Purdue University
West Lafayette, IN 47907
(01) 317-494-6531
(01) 317-494-0739 fax

5. Pump It Up: Computer Animation of a Biomechanically Based Model of Muscle Using the Finite Element Method

Produced by:

David Chen, Computer Graphics & Animation Group, MIT Media Lab

Summary:

Video to accompany paper: "Pump It Up: Computer Animation of a Biomechanically Based Model of Muscle Using the Finite Element Method." A short caption for each segment is attached.

Sponsor:

NHK, HP

Copyright:

© 1992 by MIT

Hardware:

Hewlett-Packard 9000

Software:

Research code written by David Chen, "Rendermatic & 3D"

Contact:

David T. Chen
Massachusetts Institute of
Technology
12 Sunset Road
Somerville, PA 02144
(01) 617-623-0578
(01) 617-629-2245 fax

6. A Simple Method for Extracting the Natural Beauty of Hair

Produced by:

Yoshiaki Usami (hairstyle modeling), Tsuneya Kurihara (rendering)

Summary:

This short film demonstrates a simple differential equation method for modeling some aesthetic features of hairstyles and hair dynamics. In the method, the simplified cantilever simulation is employed for hairstyling. The one-dimensional projective equations are also derived for describing dynamical behavior of hair.

Copyright:

© 1992 by Hitachi, Ltd.

Hardware:

Silicon Graphics IRIS 4D Series

Software:

In-house research program

Contact:

Kenichi Anjyo
Hitachi, Ltd.
Systems Engineering
Division
4-6 Kanda-Surugadai
Chiyoda, Tokyo, 101
Japan
(81) 3-3258-2180
(81) 3-3258-5811 fax

Produced by:
William M. Hsu

Summary:

A demonstration of direct manipulation of free-form deformations. The first segment shows a rough figure quickly made from a sphere. The second segment shows the formation of a ring prong, and explains some of the advantages of this technique. The final segment demonstrates the effects of moving several vertices simultaneously.

Sponsor:

This work was supported in part by NSF-PARPA Science and Technology Center for Computer Graphics and Scientific Visualization. We also gratefully acknowledge the sponsorship of Digital Equipment Corporation, IBM, NCR, Sun Microsystems, and Hewlett-Packard.

Copyright:

© 1992, Digital Equipment Corporation

Hardware:

HP730 TVRX T4
Sun SPARCstation II GT

Software:

UGA- Unified Graphics Architecture

Contact:

William M. Hsu
Digital Equipment
Corporation, CRL
One Kendall Square
Cambridge, MA 02139
(01) 617-621-6645
(01) 617-621-6650 fax

7. Variational Surface Modeling

Produced by:

William Welch
Andrew Witkin

Summary:

Interactive Surface Modeling.

Sponsor:

Carnegie Mellon University

Hardware:

Silicon Graphics IRIS GTX

Contact:

William Welch
Carnegie Mellon University
Computer Science
Department
5000 Farbe Avenue
Pittsburgh, PA 15213
(01) 412-268-7899
(01) 412-621-5117 fax

8. Direct Manipulation of Free-Form Deformations

9. Surface Modeling with Oriented Particle Systems

Produced by:

Richard Szeliski- Digital Equipment Corporation

David Tonnesen- University of Toronto

Summary:

We present a new surface modeling system based on interacting particles. The surfaces can be shaped interactively, with new particles being added automatically as the surface stretches and the surface topology can easily be changed.

Copyright:

© 1992 by Digital Equipment Corporation

Contact:

Richard Szeliski
Digital Equipment Corporation
One Kendall Square,
Building 700
Cambridge, MA 02139
(01) 617-621-6634
(01) 617-621-6650 fax5

10. High Resolution Virtual Reality

Produced by:

Michael Deering, Sun Microsystems

Summary:

Desktop workstation based Virtual Reality. The position of the user's head dynamically controls the stereo image perspective.

Sponsor:

Sun Microsystems

Copyright :

© 1992 by Sun Microsystems

Hardware:

Sun SPARCstation 2 GT
Logitech 3D tracker

Software:

Sun Research software

Contact:

Michael Deering
Sun Microsystems, Inc.
2550 Garcia Avenue
Mountain View, CA 94043
(01) 415-336-3017
(01) 415-336-5471 fax

11. Sound Rendering

Produced by:

Sound Rendering Software: Tapio Takala, James Hahn
Clip from "Graphic Violence"
Larry Gritz, Daria Bergen, Rudy Darken

Summary:

This animation illustrates a general methodology to produce synchronized soundtracks for animations. A sound world is modeled by associating a characteristic sound for each object in a scene (behavioral, physical-

ly-based, or recorded). The sound world is rendered by considering their path in the environment.

Copyright:

© 1992 by The George Washington University

Hardware:

Macintosh II, HP 835 Turbo SRX, Silicon Graphics IRIS

Contact:

James K. Hahn
The George Washington University
Department of EE & CS
Washington, DC 20052
(01) 202-994-5920
(01) 202-994-0227 fax

12. An Algorithm with Linear Complexity for Interactive, Physically-Based Modeling of Large Proteins

Produced by:

Mark C. Surles

Summary:

Interactive, Physically-Based Modeling maintains valid properties in a protein model as a chemist pulls atoms with springs. System finds a constrained minimum on each update. 1.25 seconds required for 760 atoms, 2205 constraints (bond length, angles and dihedral angles) and 8030 energies (attraction and repulsions).

Sponsor:

UNC- Chapel Hill

Copyright:

© 1992 by UNC- Chapel Hill

Hardware:

Silicon Graphics 4D/ 240 GTX

Contact:

Mark C. Surles
University of North Carolina at Chapel Hill

13. Interactive Spacetime Control for Animation

Produced by:

Michael Cohen, University of Utah

Summary:

Demonstrates the "SPACETIME WINDOWS" system for animation design.

Sponsor:

National Science Foundation

Copyright:

© 1992 by Michael F. Cohen

Hardware:

IBM RS 600 model 530

Software:

In house software developed at the University of Utah.

Contact:

Michael F. Cohen
Princeton University
Computer Science Depart.

35 Olden Street
Princeton, NJ 08544
(01) 09-258-4633
(01) 609-258-1771 fax

14. Through-the-Lens Camera Control

Produced by:

Software, video production, narration- Michael Gleicher
Based on a paper by Michael Gleicher and Andrew Witkin

Summary:

Through-the-Lens Camera Control is a body of techniques that permit a user to manipulate a virtual camera by controlling and constraining features in the image seen through its lens.

Sponsor:

Copyright:

© 1992 by Michael L. Gleicher,
School of Computer Science,
CMU

Hardware:

Silicon Graphics 4D/210 GTX

Software:

Bramble interaction testbed

Contact:

Michael Gleicher
School of Computer
Science
Carnegie Mellon University
Pittsburgh, PA 15213-3890
(01) 412-268-7899
(01) 412-621-5117 fax

VIDEO PAPER

15. Using Deformations to Explore 3D Widget Design

Produced by:

Scott Sona Snibbe, Kenneth P.
Herndon, Daniel C. Robbins,
D. Brookshire Conner, Andries
van Dam

Sponsor:

Sponsored in part by the NSF/
Darpa Science and Technology
Center for Computer Graphics
and Scientific Visualization and
IBM, NCR, DEC, SUN and HP.

Copyright:

© 1992 by Brown University
Computer Graphics Group

Hardware:

HP 835 Turbo SRX, Sun
SPARCstation IGT, HP 730 T4

Software:

The UGA system (developed by
the Brown Graphics Group).

Contact:

Kenneth P. Herndon
Brown University
Department of Computer
Science
Box 1910
Providence, RI 02912
(01) 401-863-7693
(01) 401-863-7657 fax

16. Interactive Inspection of Solids: Cross-Sections and Interferences

Produced by:

Jarek Rossignac, Abe Megahed, Bengt-Olaf Schneider

Summary:

The video shows interactive techniques for displaying cross-sections through solids defined by several clipping planes. The cross-sections are rendered without any geometric intersection calculations by taking advantage of utility bit-pieces in the frame buffer. The method has been extended to find and visualize interferences between solids by identifying pixels where cross-sections overlap.

Copyright:

© 1992 by IBM

Hardware:

SGI- VGX

Contact:

Bengt-Olaf Schneider
IBM T.J. Watson Research
Center
PO Box 704
Yorktown Heights, NY
10598
(01) 914-784-6002
(01) 914-784-6273 fax

Additional Issues:

ACM SIGGRAPH VIDEO
"HDTV & The Quest for
Virtual Reality"
ISSUE 60

The broadcast world is about to collide with the computer graphics world. Think of this as your survival manual. This two-tape video report, including transcript and reference documentation, will give you an up-to-the-minute overview of the standards, hardware and controversies that are as rooted in geopolitical and philosophical differences as they are technological.

For information regarding the purchase of SIGGRAPH Video Review tapes, contact:

SIGGRAPH Video Review
c/o 1st Priority
P.O. Box 576
Itasca, Illinois 60143-0576

Within USA: 800-523-5503
Outside USA: 708-250-0807
FAX: 708-250-0038