ACM SIGGRAPH 2001
Course Notes Disc #2
Courses 33 - 54

Table of Contents – Disc #2

Courses Committee

Courses Chair

Lou Harrison
North Carolina State University

Courses Committee

Rick Barry
Pratt Institute

Steve Hwan
Walt Disney Feature Animation

Val Miller
Georgia State University

Alyce Kaprow
the new studio

Courses Committee

Anselmo Lastra
University of North Carolina at Chapel Hill

Nick Orlans
MITRE Corportation

Nan Schaller
Rochester Institute of Technology

Harry Smith
University of North Carolina at Willmington

New Directions in Shape Representations

Abstract A survey of the latest research on shape representations in computer graphics. Topics include: implementations, advantages, and challenges of new alternatives to triangles and NURBS.

Organizer(s) Hanspeter Pfister, Mitsubishi Electric Research Laboratory

Notes 92.6 MB Adobe Acrobat PDF

User-Interface Design for Work, Home, and on the Way

Abstract Fundamental principles and guidelines of user-interface design for graphics-rich client-server and stand-alone applications, Web environments, mobile devices, and information appliances. Illustrated lectures and short pen-and-paper exercises focus on the challenges of designing metaphors, mental models, navigation, interaction, and appearance characteristics.

Organizer(s) Aaron Marcus, Aaron Marcus and Associates, Inc.

Notes 28.9 MB Adobe Acrobat PDF

The Technology and Practice of Digital Cinema (D-cinema)

Abstract Digital camera and recording technology now achieves spatial resolution and color reproduction comparable to 35mm film, and the brightness and spatial resolution of electronic projection are cinema quality. This course introduces the technology of D-cinema.

Organizer(s) Charles Poynton

Notes 9.2 MB Adobe Acrobat PDF

From Ivory Tower to Silver Screen: Visual Effects Companies Reveal How Research and Development Finds its Way Into Production

Abstract An in-depth look at the art and science behind some of the past year's most incredible images. Scientists, artists, engineers, and scholars from within and without the visual effects industry take the latest developments in computer-generated imagery from development to your neighborhood cineplex.

Organizer(s) Pam Hogarth
Jill Smolin, Cinesite Visual Effects

Notes 3.9 MB Adobe Acrobat PDF

Commodity-Based Scalable Visualization

Abstract Can arrays of PCs, inexpensive 3D graphics cards, and displays be combined to build scalable graphics systems? This course surveys commodity-based, clustered computer and graphics systems as possible solutions for providing high-performance, scalable visualization.

Organizer(s) Constantine Pavlakos, Sandia National Laboratories

Notes 11.8 MB Adobe Acrobat PDF

A Practical Guide to Global Illumination Using Photon Mapping

Abstract Detailed examination of the photon-mapping algorithm for rendering global illumination, including caustics, participating media, and sub-surface scattering. This advanced course provides the practical detail and insight necessary to implement and use photon mapping. This year, the course has been extended with new research results and some practical examples from industry.

Organizer(s) Henrik Wann Jensen, Stanford University

Notes 7.8 MB Adobe Acrobat PDF

3D Hardcopy: Converting Virtual Reality to Physical Models

Abstract An introduction to 3D rapid-prototyping technologies. Topics include: Technologies used by major commercial systems to build 3D parts, which systems are most appropriate for different geometries and applications, and software techniques used to transform a VR model into realizable geometry and a process plan for a rapid-prototyping system.

Organizer(s) Sara McMains, University of California, Berkeley
Carlo Séquin, University of California, Berkeley

Notes 29.0 MB Adobe Acrobat PDF

Practical Parallel Processing for Today's Rendering Challenges

Abstract Practical issues related to rendering on traditional shared and distributed-memory multi-processors as well as clusters of PCs and workstations, including render farms. Case studies demonstrate challenging real-world practical applications and describe them in detail.

Organizer(s) Alan Chalmers, University of Bristol
Timothy Davis, Clemson University

Notes 6.5 MB Adobe Acrobat PDF

How to Give a Great SIGGRAPH Talk

Abstract Organizing and presenting a course, paper, or panel at the annual SIGGRAPH conference requires impeccable technical content, exceptional imagery, and a sense of humor. Three highly respected and experienced presenters share their techniques, and a professional body-worker recommends methods to deal with the physical aspects of performance.

Organizer(s) Charles Poynton

Notes 108 KB Adobe Acrobat PDF

Seeing in 3D

Abstract Most people, even technicians, designers, and computer graphics programmers, find it very difficult to visualize 3D shapes well enough to reason about them. This course demonstrates the problem and takes participants through a series of exercises that can help them acquire this important practical skill.

Organizer(s) Geoff Wyvill, University of Otago
Bob Parslow, Consultant

Notes 744 KB Adobe Acrobat PDF

Aggressive Performance Optimizations For 3D Graphics

Abstract Performance optimizations in relationship to algorithmic design, coding, and data representation. Topics include: algorithmic optimizations and restructuring for target platforms, performance analysis with available tools, coding techniques for performance, and data representation for efficient processing.

Organizer(s) Haim Barad, Intel Corporation

Notes 4.5 MB Adobe Acrobat PDF

Advanced Topics in 3D User Interface Design

Abstract Designing effective and usable 3D user interfaces for the desktop, immersive virtual environments, or augmented reality is a non-trivial task. This in-depth discussion focuses on implementing 3D interaction techniques, strategies for designing effective 3D user interfaces, and methods of usability evaluation.

Organizer(s) Doug Bowman, Virginia Polytechnic Institute and State University

Notes 61.6 MB Adobe Acrobat PDF

Advanced Issues in Level of Detail

Abstract An advanced course on important issues in using level of detail, such as: controlling LOD fidelity, perceptual metrics of fidelity, balancing fidelity and performance, controlled topology reduction, parallel LOD computation, and view-dependent LOD.

Organizer(s) David Luebke, University of Virginia

Notes 64.2 MB Adobe Acrobat PDF

Acquisition and Visualization of Surface Light Fields

Abstract This course demonstrates several practical methods for acquisition, efficient representation, and visualization of surface-light fields, and demonstrates and interactive viewer that can render complex surface light fields consisting of more than 10,000 polygons at interactive frame rates on a PC.

Organizer(s) Radek Grzeszczuk, Intel Corporation

Notes 67.8 MB Adobe Acrobat PDF

Simulating Nature: Realistic and Interactive Techniques

Abstract The state of the art for simulating natural phenomena in both research and commercial production environments. Topics include: techniques for realistic modeling, rendering, and animation of mountains, interactively navigable worlds, plants, trees, water, smoke, and clouds; practical aspects, new interactive approximation; implementation will be discussed.

Organizer(s) David Ebert, Purdue University

Notes 53.0 MB Adobe Acrobat PDF

Advanced RenderMan 3

Abstract How to use RenderMan and its shading language to generate television- and film-quality CG images. In this course, technical directors, graphics programmers, and students learn advanced techniques for using the RenderMan standard and its implementations to produce high-end CGI.

Organizer(s) Larry Gritz, Exluna, Inc.

Notes 5.9 MB Adobe Acrobat PDF

Image Processing for Volume Graphics

Abstract The essential tools and techniques for processing volume data as part of modeling, rendering, and visualization. Topics include: linear and nonlinear filtering, interpolation, reconstruction, feature extraction, segmentation, level set methods, and model fitting.

Organizer(s) Terry Yoo, National Library of Medicine, NIH

Notes 21.2 MB Adobe Acrobat PDF

Digital Geometry Processing

Abstract Digital geometry (large polygonal meshes coming from digitizing of complex geometry) is the fourth wave of multimedia after sound, images, and video. This course teaches fundamental geometry processing algorithms based on semi-regular meshes ranging from 3D acquisition to filtering, editing, simulation, and compression.

Organizer(s) Peter Schröder, California Institute of Technology
Wim Sweldens, Lucent Technologies, Bell Labs

Notes 88.2 MB Adobe Acrobat PDF

Making Motion Capture Useful

Abstract Why motion capture is inherently difficult, how the challenges can be addressed at each stage of the motion-capture process, and how the acquired data can be successfully applied to animation.

Organizer(s) Michael Gleicher, University of Wisconsin-Madison

Notes HTML / PDF Presentation

DirectX 8 Graphics

Abstract This course provides an overview of the new DirectX Graphics architecture for DirectX8 followed by demonstrations of the advanced techniques enabled by its native support for programmable hardware. These techniques focus on the new levels of photorealism that a real-time-rendering API can achieve, including per-pixel approximations to global lighting and more conventional isotropic and anisotropic surface models.

Organizer(s) Philip Taylor, Microsoft Corporation

Notes 4.3 MB Adobe Acrobat PDF

Geometric Algebra

Abstract Geometric algebra promises to stimulate new methods and insights in all areas of science and engineering that deal with spatial relationships, including computer graphics and related fields. This course introduces the topic and provides example applications of interest to computer graphics professionals and researchers.

Organizer(s) Ambjorn Naeve, Swedish Royal Institute of Technology
Alyn Rockwood, Mitsubishi Electric Research Laboratory

Notes 5.2 MB Adobe Acrobat PDF

An Interactive Introduction to OpenGL Programming

Abstract An introduction to almost all OpenGL features, including: drawing images and 3D objects, simulating lighting, and texture mapping objects. By the end of the course, attendees will be able to author simple interactive OpenGL programs.

Organizer(s) Dave Shreiner, SGI

Notes HTML / PDF Presentation