



The 1st ACM SIGGRAPH Conference and Exhibition on Computer Graphics
and Interactive Techniques in Asia

SIGGRAPHASIA2008

NEW HORIZONS

CONFERENCE 10-13 DECEMBER 2008 EXHIBITION 11-13 DECEMBER 2008

Suntec Singapore International Convention & Exhibition Centre

ADVANCE PROGRAMME

www.siggraph.org/asia2008

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& CONVENTION BUREAU



CONFERENCE REGISTRATION CATEGORIES

- ★ Full Conference Access
- One-Day Full Conference
- Basic Conference/Exhibits Plus
- E Exhibits Only

	9 December	10 December	11 December	12 December	13 December
Registration	15:00–19:00	07:30–18:00	08:00–18:00	08:00–18:00	08:00–18:00
Merchandise Pickup & SIGGRAPH Asia Store		07:30–18:00	08:00–18:00	08:00–18:00	08:00–18:00
Reception	Time and date to be confirmed. Updated information will be available on the web site.				
★ ● ○ Art Gallery Emerging Technologies			08:30–17:30	08:30–17:30	08:30–17:30
★ ● ○ Computer Animation Festival Animation Theatre Special Programme			08:30–17:30	08:30–17:30	08:30–17:30
★ ● Electronic Theatre			19:00–21:00	19:00–21:00	16:00–18:00 19:00–21:00
★ ● Courses		08:30–17:30	08:30–17:30	08:30–17:30	08:30–17:30
★ ● Educators Programme			08:30–17:30	08:30–17:30	08:30–17:30
★ ● ○ Posters			08:30–17:30	08:30–17:30	08:30–17:30
★ ● Sketches			08:30–17:15	08:30–17:15	08:30–17:15
★ ● Technical Papers			08:00–18:00	08:00–18:00	08:00–18:00
★ ● Featured Speakers			10:30	13:30	
★ ● ○ Fast Forward Session (Technical Papers and Sketches)		18:00–20:00			
★ ● ○ E Exhibition			09:30–18:30	09:30–18:30	09:30–18:30
★ ● ○ E Exhibitor Tech Talks			10:00–18:00	10:00–18:00	10:00–18:00
★ ● ○ Job Fair			09:30–18:30	09:30–18:30	09:30–18:30

Conference schedule subject to change.

We understand the importance of convincing your employers to fund your attendance at SIGGRAPH Asia 2008. So we have developed the following value-based talking points for you to share with your boss.

Value

SIGGRAPH Asia 2008 is the place to be if you want to find the widest range of best-practice-based education in the region at one stop. This conference will significantly leverage your organisation's training dollars.

Industry Visionaries

SIGGRAPH Asia 2008 gives you access to first-hand accounts from industry icons who were once in your shoes, about their achievements and where their visions and inspirations have taken them.

Hands-On Knowledge

Acquiring the most current information in an interactive environment is the only way to protect and leverage the significant investment your organisation has made in computer graphics and interactive techniques.

One-Stop Shopping

SIGGRAPH Asia 2008 is your number-one opportunity to assess your options and opportunities in the world's most dynamic digital media region. Singapore's strategic location, its excellent facilities, and its fascinating diversity make it one of the world's leading destinations for business.

Personally Relevant Education

In four information-packed days, SIGGRAPH Asia 2008 offers a very diverse range of educational sessions, so you can tailor a valuable personal education programme that is relevant to your organisation's needs.

Saves Time

While four days out of the office might seem difficult, having to spend up to a year to amass the relevant information and education you could gain in four days would be downright daunting.

Register Early and Afford More!

If you register early for SIGGRAPH Asia 2008, you can reduce your organisation's out-of-pocket costs and gain a more attractive return on investment.

Inspiration

After your SIGGRAPH Asia 2008 experience, you'll return to work rejuvenated, with new knowledge and newly inspired creativity.

Exchange

SIGGRAPH Asia 2008 offers a powerful exchange of high-quality technical and creative information between Asia and the long-running SIGGRAPH conference in North America. This is your opportunity to participate in that exchange in real time.

Community

At SIGGRAPH Asia 2008, you will become an essential part of the SIGGRAPH community. Widen your network and bring your new connections back to your organisation.

Included with Your Registration: Categories & Fees

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Conference Registration Categories

- ★ **Full Conference Access Pass** Includes admission to all programmes and events of SIGGRAPH Asia 2008. The Full Conference DVD-ROM and ticket for the SIGGRAPH Asia 2008 Reception are also included.
- **Full Conference One-Day Access Pass** Includes admission to all programmes and events for one day of SIGGRAPH Asia 2008. Access to the Exhibition and Exhibitor Tech talks is included for three days, 11-13 December.
- **Basic Conference Access Pass/Exhibits Plus Pass** Includes admission to the Art Gallery and Emerging Technologies, the Animation Theatre, Posters, Technical Papers Fast Forward, the Exhibition, Exhibitor Tech Talks, and the Job Fair for all conference days. An Electronic Theatre ticket and the Full Conference DVD-ROM can be purchased separately.
- E Exhibits Only Ticket** Exhibits Only admission is available only upon invitation from a SIGGRAPH Asia 2008 exhibitor. You must have received an invitation code in order to be eligible. Exhibits Only ticket includes admission to the Exhibition and Exhibitor Tech Talks only.

SIGGRAPH Asia 2008 Registration Fees

(in Singapore dollars)

★ Full Conference Access	On or before 31 Oct	After 31 Oct
ACM/ACM SIGGRAPH/ SIGCHI Member	S\$ 750	S\$ 850
Student Member	S\$ 350	S\$ 450
Non-Member	S\$ 800	S\$ 900

● Full Conference One-Day	On or before 31 Oct	After 31 Oct
ACM/ACM SIGGRAPH/ SIGCHI Member	S\$ 300	S\$ 350
Student Member	S\$ 300	S\$ 350
Non-Member	S\$ 300	S\$ 350

○ Basic Conference	On or before 31 Oct	After 31 Oct
ACM/ACM SIGGRAPH/ SIGCHI Member	S\$ 50	S\$ 75
Student Member	S\$ 50	S\$ 75
Non-Member	S\$ 50	S\$ 75

- ★ ● ○ Art Gallery
- ★ ● ○ Computer Animation Festival
- ★ ● ○ Electronic Theatre
- ★ ● ○ Animation Theatre
- ★ ● Courses
- ★ ● Educators Programme
- ★ ● ○ Emerging Technologies
- ★ ● ○ E Exhibition
- ★ ● ○ E Exhibitor Tech Talks
- ★ ● ○ Fast Forward Session
- ★ ● ○ Technical Papers
- ★ ● ○ Fast Forward Session
- ★ ● ○ Sketches
- ★ ● Featured Speakers
- ★ ● ○ Job Fair
- ★ ● ○ Posters
- ★ Reception
- ★ ● ○ Special Sessions
- ★ ● Sketches
- ★ ● Technical Papers
- ★ Full Conference DVD-ROM

Included with Your Registration: Technical Materials

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Printed Materials

NOT included with any registration category. Printed materials are available for purchase at SIGGRAPH Asia 2008.

ACM Transactions on Graphics (Conference Proceedings Special Issue)

ACM Transaction on Graphics (TOG) is the foremost peer-reviewed journal in the graphics field. All papers presented at SIGGRAPH Asia 2008 will be published in this special issue of TOG.

Digital Experiences

The permanent record of images from the Art Gallery, the Computer Animation Festival, and Emerging Technologies.

Full Conference DVD-ROM

Included with Full Conference Access registration, and available for purchase at SIGGRAPH Asia 2008.

This digital publication contains the electronic version of the Technical Papers, including images and supplemental material; the Course notes, including supplemental materials (movies, source code, HTML presentations); and abstracts and supplemental materials from the Educators Programme, Sketches, and Posters. The content of the printed version of the *ACM Transactions on Graphics* (Conference Proceedings Special Issue) and the *Digital Experiences*: the SIGGRAPH ASIA 2008 Art Gallery, Emerging Technologies, and Computer Animation Festival Catalogue are also included on the Full Conference DVD-ROM.



See, Hear, and Interact

The first SIGGRAPH Asia convenes in Singapore, 10-13 December 2008, for four full days of world-class technical presentations, creative exploration, and the industry's largest Asian marketplace of products and services: the SIGGRAPH Asia 2008 Exhibition.

★ ● 11 December 10:30

Featured Speaker:



Don Greenberg
Director
Cornell University
Program of Computer Graphics
Computer Graphics Pioneer

The Expanding Boundaries of Computer Graphics

Don Greenberg challenges the new generation of computer graphicists (those who will take great professional risks to solve big problems) to dream impossible dreams and extend the influence of computer graphics to many other disciplines.

Don Greenberg has been researching and teaching in the field of computer graphics for more than 40 years. His primary focus has been on advancing the state of the art in computer graphics.

His current computer science research projects involve realistic image generation, parallelprocessing algorithms for rendering, new graphical user interfaces, and computer animation. His current application projects include ornithology and the search for the ivory-billed woodpecker, medical imaging and virtual surgery, architectural design for a green environment, and new types of computer displays, from electronic paper to touch-sensitive table displays.

He has taught courses in computer graphics in computer science, computer-aided design in architecture, computer animation in art, and technology strategy for business. Many of his graduate students have gone on to become leaders in the fields of computer graphics, computer animation, and computer-aided design for architecture. Six former students have won Hollywood's Technical Oscars, and five have won the prestigious SIGGRAPH Achievement Award.

★ ● 12 December 13:30

Featured Speaker:



Rob Cook
Vice President
Advanced Technology
Pixar Animation Studios

Behind the Scenes at Pixar

This talk takes you behind the scenes at Pixar Animation Studios for a look at how its 3D computer graphics films are made. The process starts with development of the story and continues with modelling the geometry, animating the characters, simulating things like water and cloth and hair, defining the look of the surfaces, putting lights in the scene, and rendering the images. Making a computer animated film requires close collaboration between artists and technical experts in many areas of expertise and is a great example of the value of bringing different disciplines together.

Rob Cook was the co-architect and primary author of Pixar's RenderMan software, which creates photo-realistic computer images. In 2001, he received an Oscar for his contributions, the first Academy Award ever given for software. In the last 10 years, every film nominated for a Visual Effects Academy Award has used RenderMan.

He has a Bachelor of Science degree in physics from Duke University and a Master of Science degree in Computer Graphics from Cornell University. At Cornell, he worked on simulating realistic surfaces, taking computer-generated images beyond the distinctive plastic look they had at the time. In 1981, he joined Lucasfilm/Pixar, where he developed the first programmable shader, which is now an essential part of GPUs and game engines.

He was the first to use Monte Carlo techniques in computer graphics, which was essential for simulation of complex, realistic lights and camera effects. His camera techniques were especially important in the visual effects industry, because they allowed computer-generated imagery to match the motion blur and depth of field of live-action footage when the two were combined.

In 1987, he received the ACM SIGGRAPH Achievement Award in recognition of these contributions.

CONFERENCE REGISTRATION CATEGORIES

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- E Exhibits Only

Art Gallery/ Synthesis

★ ● ○

The SIGGRAPH Asia 2008 Art Gallery presents art that transforms, melds, and transcends current Asian paradigms. This international, multicultural festival of creativity showcases work in all media – including “hybrid” formats such as text-literature collaborations, ubiquitous sounds, and zero-gravity space art – that provokes contemplation, explores surprising ideas, addresses contemporary issues, interactively engages viewers in discovery, and stimulates their intellect and creativity.

Computer Animation Festival

Electronic Theatre ★ ●
Animation Theatre ★ ● ○

The first edition of the SIGGRAPH Asia Computer Animation Festival illuminates a new horizon of animation and visual effects from around the world:

Juried Programmes

ELECTRONIC THEATRE

A very popular feature of the SIGGRAPH conference for many years, the Electronic Theatre offers some of the world’s most remarkable work selected by a distinguished international jury. In addition, works presented in the Electronic Theatre are eligible for festival prizes. The Best of Show and Jury Awards will be announced during SIGGRAPH Asia 2008.

ANIMATION THEATRE

An intriguing collection of innovative achievements in all genres of animation and visual effects.

Invited Screenings

School Showcase of promising student work, Studio Specials from the world’s leading animation and visual effects experts, and the Best of SIGGRAPH Award Winners from previous Computer Animation Festivals. Plus a Special Programme of the latest and greatest animation techniques and visual effects. The festival also features Festival Talks and other events.

Courses

★ ●

International experts present instructional sessions on every aspect of computer graphics and interactive techniques: animation, computer-human interaction, entertainment, gaming, scientific visualisation, recent breakthroughs, cool programming adventures, and more.

Educators Programme

★ ●

Envisioned as an international gathering of industry professionals and academics, the Educators Programme presents perspectives that appeal to a wide spectrum of interests. The goal is to share educational strategies adopted in both industry and academia to make the learning process more satisfying, productive, and meaningful.

Emerging Technologies

★ ● ○

SIGGRAPH Asia 2008 Emerging Technologies presents an Asian paradigm shift, a rich resource of delicate, aesthetic technologies and vivid, innovative ideas. Interactive, mind-expanding explorations in virtual and mixed reality, haptic interfaces, ubiquitous systems, digital tools, HD displays, robotics, and more. Emerging Technologies presents demos and installations of technologies that define the future of computer graphics and interactive techniques.

Exhibition

★ ● ○ E

All the products and services you need for another year of creative achievement. Try the latest systems, talk with the people who developed them, and get all the information you need to make budget and purchase decisions.

Thursday, 11 December 09:30–18:30

Friday, 12 December 09:30–18:30

Saturday, 13 December 09:30–18:30

Exhibitor Tech Talks

★ ● ○ E

Product updates and detailed, hands-on presentations that introduce attendees to the latest developments in product innovation. In these sessions, SIGGRAPH Asia 2008 exhibitors give product updates; introduce their latest developments; demonstrate software, hardware, and systems; answer questions; and talk about how their applications improve professional and technical performance.

Job Fair

★ ● ○

SIGGRAPH Asia 2008 has partnered with CreativeHeads.net to produce a best-in-class job fair! Employers and creative professionals will be able to connect months before and after the conference via the CreativeHeads.net web site, and during the conference via the actual job fair.

Thursday, 11 December 09:30–18:30

Friday, 12 December 09:30–18:30

Saturday, 13 December 09:30–18:30

International Resources

★ ● ○ E

Learn how the industry is evolving worldwide and collaborate with attendees from five continents.

The International Centre offers informal translation services and space for meetings, talks, and demonstrations. Throughout the year, the International Resources programme facilitates worldwide collaboration in the SIGGRAPH community, provides an English Review Service for SIGGRAPH and SIGGRAPH Asia to help submitters whose first language is not English, and encourages participation in all conference venues, activities, and events.

Thursday–Saturday, 11–13 December

Reception

★

Social and intellectual interaction with the movers and shakers of the international SIGGRAPH community.

Touch base with the people you need to know for another year of business, professional success, and adventure.

Sketches & Posters

Sketches: ★ ●

Posters: ★ ● ○

Sketches

A dynamic forum for thought-provoking, speculative ideas, novel applications, what-if concepts, and behind-the-scenes production details. Following each sketch presentation, authors discuss future implications of their work and answer audience questions.

Posters

Graphic depictions of incremental or half-baked but innovative ideas displayed throughout the week with scheduled sessions for informal discussions.

Technical Papers

★ ●

The SIGGRAPH Asia 2008 Technical Papers programme is a premier international forum for disseminating provocative and important new work in computer graphics and interactive techniques. Leading international experts from Asia and beyond present peer-reviewed research in rendering, modelling, animation, human-computer interaction, computer-aided design, virtual reality, and visualisation.

Technical Papers & Sketches Fast Forward Sessions

★ ● ○

ACM SIGGRAPH's first back-to-back Technical Papers and Sketches Fast Forward Session. Get a preview of the latest research in computer graphics and interactive techniques and select the Technical Papers and Sketches that you need to attend later in the week.

Wednesday, 10 December

SESSION 1 08:30–10:15

COURSES

- Introduction to Computer Graphics (Part I)
- An Introduction to Programming with OpenGL and OpenGL ES (Part I)
- Scattering (Part I)
- Interactive Massive Model Rendering (Part I)
- Pixar's RenderMan (Part I)*

SESSION 2 10:30–12:15

COURSES

- Introduction to Computer Graphics (Part II)
- An Introduction to Programming with OpenGL and OpenGL ES (Part II)
- Scattering (Part II)
- Interactive Massive Model Rendering (Part II)
- Pixar's RenderMan (Part II)

* This course is strictly limited to 25 attendees. Please refer to the registration instruction details on page 17.

SESSION 3 13:45–15:30

COURSES

- An Introduction to Programming with OpenGL and OpenGL ES (Part III)
- Light Interaction with Human Skin: From Believable Images to Predictable Models (Part I)
- Interactive Massive Model Rendering (Part III)
- Pixar's RenderMan (Part III)

SESSION 4 15:45–17:30

COURSES

- An Introduction to Programming with OpenGL and OpenGL ES (Part IV)
- Light Interaction with Human Skin: From Believable Images to Predictable Models (Part II)
- Interactive Massive Model Rendering (Part IV)
- Pixar's RenderMan (Part IV)
- There Can Be Only One: Independent Animation for the Lonely

SESSION 5 18:00–20:00

FAST FORWARD SESSION

ACM SIGGRAPH's first back-to-back Technical Papers and Sketches Fast Forward Session. Get a preview of the latest research in computer graphics and interactive techniques and select the Technical Papers and Sketches that you need to attend later in the week.

Thursday, 11 December

SESSION 1

08:30–10:15

08:30–10:15

08:30–10:00

08:00–10:15

COURSES

None

EDUCATORS PROGRAMME

Methodologies in Learning

Session Chair:
Mark Chavez

- Computer Graphics in Context: An Approach to a First Course in Computer Graphics
- Using Augmented Reality to Promote The Understanding of Materials Science to School Children
- Simulating Educational Physical Experiments in Augmented Reality

SKETCHES

GPU-Based Methods

Session Chair:
Edward Angel

- GPU Crowd Simulation
- GPU-Based Scene Management for Rendering Large Crowds
- GPU Tessellation for Detailed, Animated Crowds
- A GPU-Based Approach for Real-Time Haptic Rendering of 3D Fluids

TECHNICAL PAPERS

Shape Modelling

Session Chair:
Tao Ju

- Single Image Tree Modelling
- Sketch-based Tree Modelling Using Markov Random Field
- Space-Time Surface Reconstruction Using Incompressible Flow
- Non-Homogeneous Resizing of Complex Models
- (TOG) Mesh Ensemble Motion Graphs: Data-Driven Mesh Animation with Constraint

FEATURED SPEAKER SESSION 10:30–12:00

FEATURED SPEAKER: DON GREENBERG

SESSION 3

13:45–15:30

13:45–15:30

13:45–15:15

13:45–15:30

COURSES

- Real-Time Individualized Virtual Humans (Part I)
- CG Production Principles: Keeping Your Money On The Screen & Off The Floor
- Mesh Parameterization: Theory and Practice (Part I)
- Introduction to Computer Graphics Shaders with glman (Part I)

EDUCATORS PROGRAMME

Professional/Academic

Session Chair:
Se-hyung Park

Welcome and Overview of Programme

PROGRAMME KEYNOTE:
The New Perspective of Consilience of Arts and Technology in the Era of Ubiquitous Computing

SKETCHES

Lucasfilm

Session Chair:
Ken Anjyo

- Clone Wars Animation in Lucasfilm Animation Singapore
- Lighting Clone Wars: A New Planet Every Week
- Keeping It Real: Classical Art Principles in Today's VFX Features
- The Invisible Art Behind Ironman
- Star Wars: The Clone Wars TV Series: Making the Impossible Happen

TECHNICAL PAPERS

Character Animation I

Session Chair:
Subodh Kumar

- Animating Responsive Characters with Dynamic Constraints in Near-Unactuated Coordinates
- Synthesis of Constrained Walking Skills
- Interaction Patches for Multi-Character Animation
- Motion Overview of Human Actions

Thursday, 11 December

SESSION 4

15:45–17:30

COURSES

- Real-Time Individualized Virtual Humans (Part II)
- Multiperspective Modelling, Rendering, and Imaging
- Mesh Parameterisation: Theory and Practice (Part II)
- Introduction to Computer Graphics Shaders with glman (Part II)

15:45–17:30

EDUCATORS PROGRAMME

Methodologies In Learning

Session Chair:
Martin Constable

- Making Intelligent Sounds
- Shift to The Third Space - isAT 2008
- The Solution of Indie-Creation on Network

15:45–17:15

SKETCHES

Interactive Techniques

Session Chair:
Matt Adcock

- Balance Ball Interface
- Fu-Fuu: An Interactive Game using Breath Control
- Tracking the Position of a Mobile Device on Interactive Screens with RFID
- Bear's Beer and Smart Platter—Handheld Interactive Haptic Display

15:45–18:00

TECHNICAL PAPERS

Fun With Single Images

Session Chair:
Sing Bing Kang

- Deep Photo: Model-based Photograph Enhancement and Viewing
- Animating Animal Motion from Still
- Optimised Scale-and-Stretch for Image Resizing
- Interactive Normal Reconstruction from a Single Image
- Depicting Procedural Caustics in Single Images

Friday, 12 December

SESSION 1

08:30–10:15	08:30–10:15	08:30–10:00	08:00–10:15	08:00–10:15
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Discrete Differential Geometry: An Applied Introduction (Part I) • Beyond Programmable Shading (Part I) • Seeing in 3D (Part I) 	<p>Game Education</p> <p>Session Chair: Gao Wei Hua</p> <ul style="list-style-type: none"> • Creating a Multi-Discipline Gaming Curriculum: Avoiding Mistakes, Missteps, and Growing Pains • Sharing the Magic Circle with Spatially Inclusive Games • Gaming: Back to the Basics 	<p>Arts And Robots</p> <p>Session Chair: Daniel Maskit</p> <ul style="list-style-type: none"> • Shadow Play • Automatic Composition for Contemporary Dance Sequences • Nervixx: An Introduction of Biosignal to Live Video Performance • Rendering Lots of Robots 	<p>Character Animation II</p> <p>Session Chair: Doug James</p> <ul style="list-style-type: none"> • Facial Performance Synthesis Using Deformation-Driven Polynomial • Reusable Skinning Templates Using Cage-Based Deformations • Accelerometer-based User Interfaces for the Control of a Physically Simulated Character • Video Puppetry: A Performative Interface for Cutout Animation • Laughing Out Loud: Control for Modelling Anatomically Inspired Laughter Using Audio 	<p>Lighting, Shading & GPUs</p> <p>Session Chair: Nelson Max</p> <ul style="list-style-type: none"> • Real-time KD-Tree Construction on Graphics Hardware • Automated Reprojection-based Pixel Shader Optimisation • Fast, Realistic Lighting and Material Design Using Nonlinear Cut Approximation • Imperfect Shadow Maps for Efficient Computation of Indirect Illumination • Progressive Photon Mapping

SESSION 2

10:30–12:15	10:30–12:15	10:30–12:00	10:30–12:15
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Discrete Differential Geometry: An Applied Introduction (Part II) • Beyond Programmable Shading (Part II) • Seeing in 3D (Part II) 	<p>The Mindspace of Learning</p> <p>Session Chair: Ayumi Miyai</p> <ul style="list-style-type: none"> • Practice Project Management in Website Design: An Experiential Learning Simulation • Guitar Man 	<p>Photographs and Drawings</p> <p>Session Chair: Diego Gutierrez</p> <ul style="list-style-type: none"> • Forward Lean – Deriving Motion Illustrations from Video • Automatic 3D Caricature Generation By Learning in enlarged Manifold Space • Visualizing Adaptive Clusters of Digital Photographs • Clean up Your Image Using Internet Photo Collections 	<p>Image-Based Capture</p> <p>Session Chair: Chi-Keung Tang</p> <ul style="list-style-type: none"> • Shield Fields: Modelling and Capturing 3D Occluders • Time-Resolved 3D Capture of Non-Stationary Gas Flows • A Photometric Approach for Estimating Normals and Tangents • Extracting Depth and Matte Using a Colour-Filtered Aperture

Friday, 12 December

FEATURED SPEAKER SESSION 13:30–15:00

FEATURED SPEAKER: ROB COOK

SESSION 3

13:45–15:30	13:45–15:30	13:45–15:15	13:45–15:30
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Discrete Differential Geometry: An Applied Introduction (Part III) • Beyond Programmable Shading (Part III) • Seeing in 3D (Part III) 	None	<p>Curves, Planes, and Terrains</p> <p>Session Chair: Olga Sorkine</p> <ul style="list-style-type: none"> • Single View Sketch-Based Modelling from Construction Lines • Interactive Control of 3D class A Bézier Curves • Hexagonal Geometry Clipmaps for Spherical Terrain Rendering • Relief Clipping Planes for Real-Time Rendering 	<p>Texture</p> <p>Session Chair: Johannes Kopf</p> <ul style="list-style-type: none"> • Random-Access Rendering of General Vector Graphics • Texture Amendment: Reducing Texture Distortion in Constrained Parameterisation • IGT: Inverse Geometric Textures • A Psychophysically Validated Metric for Bidirectional Texture Data Reduction

SESSION 4

15:45–17:30	15:45–17:30	15:45–17:15	15:45–18:00
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Discrete Differential Geometry: An Applied Introduction (Part IV) • Beyond Programmable Shading (Part IV) • Seeing in 3D (Part IV) 	<p>Methodologies in Learning</p> <p>Session Chair: Russell Pensyl</p> <ul style="list-style-type: none"> • Comparison of Animation Storyboard Education in China and the United States • Bridging the Gap Between Education and Professional Production 	<p>Volumes</p> <p>Session Chair: Baoquan Chen</p> <ul style="list-style-type: none"> • Optimized Volume Sampling based on Manipulation Points for Volume Deformation • Curvature-based Volume Visualization of Local Structures • Rigid-Body Interaction in SPH 	<p>Reflectance & Subdivision</p> <p>Session Chair: Kun Zhou</p> <ul style="list-style-type: none"> • Practical Modelling and Acquisition of Layered Facial Reflectance • A Layered Heterogeneous Reflectance Model for Acquiring and Rendering Human Skin • Phong Tessellation • Subdivision Shading • Real-Time Reyes-Style Adaptive Surface Subdivision

Saturday, 13 December

SESSION 1

08:30–10:15	08:30–10:15	08:30–10:00	08:00–10:15	08:00–10:15
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Advanced Illumination Techniques for GPU-Based Volume Ray Casting (Part I) • Developing Augmented Reality Applications (Part I) 	<p>Methodologies in Teaching</p> <p>Session Chair: Chen Meifen</p> <ul style="list-style-type: none"> • Deconstructing an Old Master Painting Using Photoshop's Advanced Toolset • Using Animation and Interactive Virtual Technology to Create Interpretive Materials for Museum Learning and Promotion • Chinese Whispers 	<p>Visual Simulation</p> <p>Session Chair: Geoff Wyvill</p> <ul style="list-style-type: none"> • Visual Simulation of Scattering and Settling of Fine Particles • A Visual Simulation for Gold Leaf and Japanese Lacquerware • Fire Simulation and Rendering for "Hellboy 2: The Golden Army" • Interactive Simulation of the Process of Glottal Wave Generation Using a GPU 	<p>Mesh Processing</p> <p>Session Chair: Olga Sorkine</p> <ul style="list-style-type: none"> • Efficient Traversal of Mesh Edges Using Adjacency Primitives • Randomised Cuts for 3D Mesh Analysis • Deduce Interpolating Subdivision Schemes From Approximating Subdivision Schemes • Spectral Quadrangulation With Orientation and Alignment Control • Quadrilateral Mesh Simplification 	<p>Colourisation & Upsampling</p> <p>Session Chair: Marc Pollefeys</p> <ul style="list-style-type: none"> • A Virtual Restoration Stage for Real-World Objects • Superimposing Dynamic Range • VirtualStudio2Go: Digital Video Composition for Real Environments • Intrinsic Colourisation • Fast Image/Video Upsampling

SESSION 2

10:30–12:15	10:30–12:15	10:30–12:00	10:30–12:15
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Advanced Illumination Techniques for GPU-Based Volume Ray Casting (Part II) • Developing Augmented Reality Applications (Part II) 	<p>Pedagogy in Action</p> <p>Session Chair: Lucy Petrovic</p> <ul style="list-style-type: none"> • Incorporating Animation Technologies into Tools for Colonial American Education • Wireless Sensor Network to Support Multiple-Student Group Learning Game with One PC in Classroom 	<p>Lighting and Reflectance</p> <p>Session Chair: Wojciech Jarosz</p> <ul style="list-style-type: none"> • B-Spline Volume vs. Other BRDF Models • SPARTA: A Scalable Architecture for Ray-Tracing Applications • Spatial-Directional Radiance Caching • Fast, Approximate HDR Image-Based Lighting Using Summed-Area Tables 	<p>Non-Photorealistic Rendering</p> <p>Session Chair: Ken Anjyo</p> <ul style="list-style-type: none"> • Adaptive Cutaways for Comprehensible Rendering of Polygonal Scenes • Richness-Preserving Manga Screening • Line-Art Illustration of Dynamic and Specular Surfaces • Demarcating Curves for Shape Illustration

Saturday, 13 December

SESSION 3

13:45–15:30	13:45–15:30	13:45–15:15	13:45–15:30
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Modern OpenGL: Its Design and Evolution (Part I) • Interactive Introduction to X3D Graphics (Part I) 	None	<p>Calibration and Acquisition</p> <p>Session Chair: Craig Donner</p> <ul style="list-style-type: none"> • Image-Correction Method for Multi-Projector Display Using SIFT Features • Gloss and Normal Map Acquisition Using Gray Codes • Considering Shape Reconstruction From Specular Reflection • Image-Based Roughness Modelling Using Perlin Noise 	<p>Urban Modelling</p> <p>Session Chair: Xin Tong</p> <ul style="list-style-type: none"> • Continuous Model Synthesis • Interactive 3D Architectural Modelling From Unordered Photo Collections • Interactive Example-Based Urban Layout Synthesis • Image-based Façade Modelling

SESSION 4

15:45–17:30	15:45–17:30	15:45–17:15	15:45–18:00
COURSES	EDUCATORS PROGRAMME	SKETCHES	TECHNICAL PAPERS
<ul style="list-style-type: none"> • Modern OpenGL: Its Design and Evolution (Part II) • Interactive Introduction to X3D Graphics (Part II) 	<p>Professional/Academic</p> <p>Session Chair: Pan Zhigeng</p> <ul style="list-style-type: none"> • Teaching 3D animation: the Balance between Creative versus Technical Skills • Computer Games Degrees in the UK: A Review of Current Practice • From Motion Capture to Interactive Animation 	None	<p>Physically Based Animation</p> <p>Session Chair: Hyeong-Seok Ko</p> <ul style="list-style-type: none"> • Magnets in Motion • Real-Time Control of Physically Based Simulations Using Gentle Forces • Staggered Projections for Accurate Frictional Contact in Multibody Systems • Optimising Cubature for Efficient Integration of Subspace Deformations • Fast Animation of Turbulance Using Energy Transport and Procedural Synthesis

International experts present instructional sessions on every aspect of computer graphics and interactive techniques: animation, computer-human interaction, entertainment, gaming, scientific visualization, recent breakthroughs, cool programming adventures, and more.

These unique educational opportunities are only available at SIGGRAPH Asia 2008.

CONFERENCE REGISTRATION CATEGORIES

- ★ Full Conference Access
- One-Day Full Conference

Seating in Courses is on a first-come, first-served basis. Please be sure to arrive early for the Courses you wish to attend. All the Class Notes are on the Full Conference DVD-ROM that Full Conference attendees receive with their registration.

Wednesday, 10 December

PIXAR'S RENDERMAN



Wednesday, 10 December

09:00–17:00

Level: Beginner

Attendance for this course is limited to 25 persons.

Attendance is on a first-come, first-served basis. Attendees who are interested in this session are required to join a dedicated queue labelled Pixar's RenderMan Course at Level 1, Registration Counter, Suntec Singapore International Convention and Exhibition Centre. The first 25 persons in this queue with their registration badges already collected will be allowed to attend the course. If you are hoping to attend this course, you are strongly advised to collect your registration badge the day before.

Transportation will be provided to the offsite computer laboratory where this course is presented, and at the end of the course, a return trip back to the convention centre.

Departure time is 08:15, Wednesday, 10 December.

If you are hoping to attend this course, you are strongly advised to collect your registration badges the day before.

An overview of:

- The structure of RenderMan scene descriptions
- The implementation and application of custom shaders
- The use of RenderMan for Maya Pro

This full-day course is an intensive, hands-on practical introduction to the RenderMan system and Pixar's RenderMan, a high-quality renderer that is widely used in the animation and digital effects industry.

In the first part of the course, attendees gain sufficient familiarity with RenderMan's scene description protocol to enable them to edit and manipulate RIB files. RIB files enable modelling and animation applications to communicate with Pixar's RenderMan.

The second part of the course introduces the use of the RenderMan Shading Language (RSL). Attendees are not expected to have prior programming experience. The intention is to provide an overview of the creative potential of the shading language to the point where attendees will be confident to continue creating their own custom shaders with RSL. During the final part of the course, attendees use Pixar's high-end product, RenderMan Studio, in conjunction with AutoDesk's Maya. Prior experience with Maya will be advantageous, but it is not required.

PREREQUISITES

None

INTENDED AUDIENCE

This course is ideal for artists and designers who have prior experience using a 3D modelling and animation application but who wish to investigate the features of a graphics system that has become the de-facto standard for the feature film industry.

INSTRUCTOR

Malcolm A. Kesson
Savannah College of Art and Design

INTRODUCTION TO COMPUTER GRAPHICS



Wednesday, 10 December

08:30–12:15

Level: Beginner

This course is open to attendees in three registration categories: Full Conference Access, One-Day Full Conference, and Basic Conference/Exhibits Plus. All other courses require Full Conference registration.

A SIGGRAPH conference is an exciting event, but it is often an intimidating experience for first-time attendees. There are so many new terms, new concepts, and new products to understand. And all the simultaneous programs leave new attendees baffled and frustrated about how to spend their time.

This course is designed to ease newcomers into the SIGGRAPH Asia 2008 experience by presenting the fundamental concepts and vocabulary at a level that can be readily understood. Far from being made up of dry facts, this course also portrays the fun and excitement that led most of us to the SIGGRAPH conference in the first place. After the course, attendees will be well-prepared to understand, appreciate, enjoy, network in, and learn from the rest of the SIGGRAPH Asia experience.

PREREQUISITES

A basic understanding of computers and algebra.

INTENDED AUDIENCE

The complete newcomer who wants to learn some of the basic terms and concepts in computer graphics, and receive some guidance on how to get the most out of attending SIGGRAPH Asia 2008.

INSTRUCTORS

Mike Bailey
Oregon State University

Steve Cunningham
Brown Cunningham Associates

FINDING YOUR PLACE IN DIGITAL PRODUCTION

★ ●
Wednesday, 10 December
13:45–15:30
Level: Beginner

Deciding to pursue a job in digital production is easy for many people, but once you've decided that you want to help produce animation, visual effects, and video games, and you've completed the relevant training, then what? The process of preparing material to present to a potential employer can be nerve wracking and confusing. Many aspiring artists put together a demo reel before even considering what jobs they might apply for.

This tutorial presents an inside view of what the industry expects from a candidate's show reel, portfolio, and résumé, and the simple steps artists can take to live up to those expectations. While there is quite a bit of information available about the mechanics of putting together a demo reel and résumé, those details are not very useful if you don't know what purpose your reel will be serving.

There is intense competition for digital production jobs, and just having a reel with some animation or modelling on it is no longer all it takes to land an interview. Industry veterans Tad Leckman and Patricia Kung share their experiences reviewing reels and résumés, and preparing young artists for careers in digital media. They also show and analyse examples of effective demo reel.

PREREQUISITES

Basic understanding of CG terminology.

INTENDED AUDIENCE

Students, new graduates, and individuals with production experience who are

thinking about their next move. This tutorial is also useful for educators, parents, and recruiting professionals.

INSTRUCTORS

Tad Leckman
Lucasfilm Animation Singapore

Patricia Kung
Animal Logic

INTERACTIVE MASSIVE MODEL RENDERING

★ ●
Wednesday, 10 December
08:30–17:30
Level: Intermediate

Users consistently try to manage and display more data than any computing system allows, especially when they work with 3D models for films, games, CAD systems, medical imaging, seismic exploration, information spaces, etc. In this course, seven international researchers and practitioners present software and hardware strategies for real-time visualization of and interaction with massive models.

Even when they work with higher-performance computing systems, game and entertainment producers use a set of techniques to limit model size during real-time visualization and interaction sessions. However, polygon decimation, texture maps, and related techniques do not readily apply to domains where high levels of visual accuracy are essential. Such models can contain a billion polygons or voxels and millions of individually selectable objects.

Although the course addresses ray tracing and rasterization, its objective is to explore a systems approach. It focuses on system integration and optimization techniques that let extract higher performance, such as:

- Software techniques to overcome performance and memory size limitations (kd-trees, occlusion culling, LODs, multi-threaded programming, memory-mapped files, display lists, cache coherence).
- Computing system architecture (parallel-processor architectures, single and multi-GPU hardware, thin client, hardware occlusion culling, cell computers, multi-core CPUs).
- Scalable system architecture

(preprocessing, large user communities, model-configuration management, network transfer of basic geometry, variable form-factor display devices).

- Practical implementation issues.

The course summarizes overall performance-improvement strategies, gives examples of industrial and academic approaches using both rasterization and ray tracing, and concludes with real-world experience in a commercial environment.

PREREQUISITES

General knowledge of the difference between ray tracing and rasterization. Familiarity with computing-system architecture, graphics hardware, and parallel processing.

INTENDED AUDIENCE

This course is intended for users of complex models and practitioners who build real-time 3D applications. The techniques are applicable to any community that commonly reduces model detail (games, for example) or works only with model chunks (CAD, for example).

INSTRUCTORS

Enrico Gobetti
Center for Advanced Studies, Research and Development in Sardinia

Philipp Slusallek
Universität des Saarlandes

Andreas Dietrich
NVIDIA Research

Marco Agus
Center for Advanced Studies, Research and Development in Sardinia

Renato Pajarola
Universität Zürich

Sung-eui Yoon
Korea Advanced Institute of Science and Technology

AN INTRODUCTION TO PROGRAMMING WITH OPENGL AND OPENGL ES

★ ●
Wednesday, 10 December
08:30–17:30
Level: Beginner

OpenGL, and its derivative API OpenGL ES, are among the most widely available

programming libraries for computer graphics applications, and are used for almost every discipline of computer graphics: research, scientific visualisation, entertainment and visual effects, computer-aided design, interactive gaming, and many more. This course provides an accelerated introduction to creating applications using the OpenGL application-programming interfaces (API). It covers fundamental topics such as modelling, lighting, depth buffering, and texture mapping, and introduces advanced topics such as using vertex and fragment shaders.

The course introduces OpenGL's operation through more than just code snippets and static images. It utilizes several applications that introduce various subsets of the OpenGL API (for example, lighting or texture mapping). And it includes tutorials that allow attendees to interactively modify the values passed into OpenGL and immediately see the resulting images.

Topics include how OpenGL represents geometric objects; how lighting, texture mapping, anti-aliasing, and other supported features are applied; and how to use pixel images, both in elementary image processing and imagery for texture maps. The OpenGL Shading Language (GLSL) is introduced using both vertex and fragment programs. Advanced topics, whose scope precludes a detailed discussion in an introductory class, are introduced with references for further study.

PREREQUISITES

Ability to read simple programs written in the C language. No previous experience writing graphics programs is required. Knowledge of basic concepts from linear algebra (vector notation and matrix multiplication) is useful but not required.

INTENDED AUDIENCE

Novice graphics programmers who want to learn how to author interactive, 3D, graphics applications using OpenGL and OpenGL ES.

INSTRUCTORS

Dave Shreiner
ARM, Inc.

Ed Angel
University of New Mexico

SCATTERING

★ ●

Wednesday, 10 December

08:30–12:15

Level: Intermediate

A taxonomy of scattering phenomena and how to treat them efficiently, by leveraging the wealth of knowledge from computer graphics and computer vision. This course shows a wide range of multidisciplinary applications in both overlapping fields, from appearance modelling to vision in bad weather, and reviews measurement techniques.

Computer graphics and computer vision deal with acquiring, interpreting, and presenting the rich visual world around us. These are exciting multidisciplinary fields of research with a wide spectrum of applications that affect our daily lives. However, most current computer-generated imagery represents scenes with clear atmospheres, neglecting light scattering effects. Analogously, most computer-vision systems are not successful when deployed in uncontrolled outdoor environments.

This course addresses the challenges presented by light scattering in computer graphics and computer vision. Both fields have seen great advances over the past few years, but most of the existing algorithms still assume that light emitted by a source or reflected off a surface reaches the sensor unaltered. From a computer graphics perspective, this is due mainly to the complex interactions that occur and the high computational costs of simulating them. In computer vision, scattering has traditionally been considered as noise that one should ideally get rid of.

Scattering effects are one fundamental hurdle that must be overcome to significantly extend and enhance current state-of-the-art graphics and vision techniques and achieve successful impact in a wide range of domains. Given the increasing overlap between computer graphics and computer vision, including hot research fields such as computational photography, this course is useful for practitioners in both communities and everybody who studies the intersection of the two.

PREREQUISITES

None

INTENDED AUDIENCE

This course is intended for people involved in computer graphics, computer vision,

or related fields such as computational photography. It is particularly relevant to SIGGRAPH Asia attendees, as it provides a good understating of scattering phenomena, state-of-the-art techniques to simulate it and treat it, and a wide range of applications. It is especially useful for attendees who are interested in particular applications such as medical imaging, oceanography, driving simulators, and game production.

INSTRUCTORS

Diego Gutierrez
Universidad de Zaragoza

Henrik Wann Jensen
University of California, San Diego

Srinivasa Narasimham
Carnegie Mellon University

Wojciech Jarosz
University of California, San Diego

LIGHT INTERACTION WITH HUMAN SKIN: FROM BELIEVABLE IMAGES TO PREDICTABLE MODELS

★ ●

Wednesday, 10 December

13:45–17:30

Level: Intermediate

This course on biophysically based models of light interaction with skin tissues provides details and interdisciplinary concepts often omitted from publications. The emphasis of the course is on scientific issues that need to be addressed in rendering of realistic and predictable images of human skin.

Recent research in image synthesis has focused on rendering of believable and predictable images of biological materials. This course addresses an important topic in this area: predictive simulation of skin appearance. The modelling approaches, algorithms, and data examined during this course can be also applied to rendering other organic materials such as hair and ocular tissues.

The first module of the course provides the biophysical background required not only for development of models of light interaction with organic materials, but also for their evaluation. It begins with a review of optics and "measurement-of-appearance" concepts, followed by a presentation of biological factors involved in the processes of light propagation and

absorption in skin tissue. A concise review of modelling approaches used in biomedical and related fields, and often cited by computer graphics researchers, completes this module. The second module provides detailed descriptions of computer graphics models of light interaction with human skin, including approaches to practical issues involving their implementation and analysis of their strengths and limitations. Recent developments involving these models, such as extensions, applications, and more accurate or efficient versions, are also examined. The course concludes with a discussion of current and future challenges related to rendering human tissues.

PREREQUISITES

Familiarity with basic optics concepts and radiometric terms. Attendees should have a working knowledge of standard graphics techniques and terminology. Experience with numerical methods is helpful, but not required.

INTENDED AUDIENCE

Students, practitioners, and researchers interested in rendering, biomedical imaging, and natural phenomena.

INSTRUCTORS

Gladimir Baranoski
University of Waterloo

Aravind Krishnaswamy
Adobe Systems Incorporated

THERE CAN BE ONLY ONE: INDEPENDENT ANIMATION FOR THE LONELY

★ ●

Wednesday, 10 December, Tutorial
15:45–17:30
Level: Beginner

Many logistical challenges confront the independent animator. The task of single-handedly producing an animated piece (budget, schedule, creative blocks, copyright issues, sound quality, publicity, distribution, being a jack of all trades, etc.) at first may seem overwhelming and insurmountable, yet this is not the case. With proper planning and adoption of professional strategies for success, animations produced by independent creators can be more creative and higher quality, and their personal experiences can be more rewarding and enjoyable.

In this course, attendees learn pre-production concepts and techniques that

will allow them to focus on creative aspects of their projects and avoid time-consuming scheduling mistakes that can cripple production. From concept to design, storyboard to animatic, attendees learn the smartest ways to work and how to save time, money, and heartache as they seek to realize their unique visions. Scheduling, resource management, and copyright issues are explored and discussed in the production segment of the course, to keep the artist on track for project completion while taking care of minute details that could lead to major legal and logistical roadblocks. In the post-production segment, the final edit, output issues, credits, DVD authoring, making press kits, and final submission to animation festivals are addressed, giving attendees a clear, organized plan of creation and production. With more careful organisation, animators can concentrate on the creative aspects of their work and not get bogged down in unforeseen details.

PREREQUISITES

General knowledge of computer graphics and at least beginning-level experience in digital animation and design, either 3D or 2D.

INTENDED AUDIENCE

This course is ideally suited for beginning and intermediate student animators, and interested professionals and (especially) independent animators.

INSTRUCTORS

Kristen Palana
The American University of Rome

Steve Rittler
William Paterson University

INTRODUCTION TO COMPUTER GRAPHICS SHADERS WITH GLMAN

★ ●

Thursday, 11 December
13:45–17:30
Level: Intermediate

An introduction to the programmable shader capabilities of the latest generation of graphics cards. Attendees learn to write graphics programmes using vertex, fragment, and geometry shaders, and use the glman tool to develop the shaders independently from the applications that will use them.

The course covers basic shader concepts, showing how shaders fit into the traditional graphics pipeline and how they communicate with each other and with an application. The GLSL language is introduced, along with the special types and built-in variable names it uses, and how the GLSL API is used to add shaders to an OpenGL application. Examples illustrate how shaders can be used to implement advanced modelling and shading features, and the use of noise, image manipulation techniques, and LOD operations. Specific applications of shaders in scientific visualisation are also presented. A CD containing the glman tool and code for all the examples used in the course will be distributed, and attendees will be able to install glman on their laptops and work with the examples as the course progresses.

After this course, an experienced OpenGL programmer will be able to write shader programmes and integrate them into graphics applications.

PREREQUISITES

A solid knowledge of fixed-function OpenGL programming and a basic understanding of higher-level computer graphics concepts.

INTENDED AUDIENCE

Anyone who wants to understand and use the vertex, fragment, and geometry shaders that are available with the GLSL shading language in the latest versions of OpenGL.

INSTRUCTORS

Steve Cunningham
Brown Cunningham Associates

Mike Bailey
Oregon State University

MESH PARAMETERISATION: THEORY AND PRACTICE

★ ●

Thursday, 11 December
13:45–17:30
Level: Intermediate

Mesh parameterisation is a powerful geometry-processing tool with numerous computer graphics applications, from texture mapping to animation transfer. This course outlines its mathematical foundations, describes recent methods for parameterizing meshes over various domains, discusses emerging tools like global parameterisation and inter-surface

mapping, and demonstrates a variety of parameterisation applications.

For any two surfaces with similar topology, there exists a bijective mapping between them. If one of these surfaces is a triangular mesh, the problem of computing such a mapping is referred to as mesh parameterisation. The surface that the mesh is mapped to is typically called the parameter domain.

Parameterisation was introduced to computer graphics for mapping textures onto surfaces. Over the last decade, it has gradually become a ubiquitous tool for many mesh-processing applications, including detail-mapping, detail-transfer, morphing, mesh-editing, mesh-completion, remeshing, compression, surface-fitting, and shape-analysis. In parallel to the increased interest in applying parameterisation, various methods were developed for different kinds of parameter domains and parameterisation properties.

The goal of this course is to familiarize attendees with the theoretical and practical aspects of mesh parameterisation. It provides the skills needed to implement or improve existing methods, investigate new approaches, and critically evaluate the suitability of the techniques for a particular application.

The course begins with an introduction to the general concept of parameterisation and an overview of its applications. The first half of the course then focuses on planar parameterisations, while the second addresses more recent approaches for alternative domains. The course covers the mathematical background, including intuitive explanations of parameterisation properties like bijectivity, conformality, stretch, and area-preservation. The state of the art is reviewed by explaining the main ideas of several approaches, summarizing their properties, and illustrating them using live demos. The course concludes with a list of open research problems and potential applications that can benefit from parameterisation.

PREREQUISITES

Some prior exposure to mesh representation of geometric models and a working knowledge of vector calculus, elementary linear algebra, and the fundamentals of computer graphics. Some familiarity with differential geometry and graph theory is useful, but not required.

INTENDED AUDIENCE

Graduate students, researchers, and application developers who want to understand and use the concepts and technologies used in mesh parameterisation.

INSTRUCTORS

Kai Hormann
Technische Universität Clausthal

Konrad Polthier
Freie Universität Berlin

Alla Sheffer
The University of British Columbia

REAL-TIME INDIVIDUALIZED VIRTUAL HUMANS

★ ●

Thursday, 11 December

13:45–17:30

Level: Intermediate

The latest techniques for modelling fast, individualized, animatable virtual humans for real-time applications. Because a human is composed of a head and a body, this course analyses how these two parts can be modeled and globally animated. More precisely, it shows how individualized real-time bodies can be automatically generated from scanned data or from interactive measurements and how an automatic skeleton can be created for any body size, animated automatically, controlled in real time, and retargeted according to a motion-sequences database. Other topics include: facial animation from facial motion capture and simulation of interactive, realistic talking virtual humans, including personality models and complete body gestures.

The course also shows how crowds are modeled in real time using dynamic meshes, static meshes, and impostors, and explains techniques for adding variety to crowds, including individual animation, individualized path-planning, and accessories.

Several case studies in cultural heritage, emergency situations, and fashion modelling are presented to illustrate interaction with virtual humans. And the course concludes with a summary of open research topics in the virtual-human field.

PREREQUISITES

Familiarity with the fundamentals of computer graphics and computer animation, geometrical methods, collision detection

and response, and real-time techniques is highly recommended but not mandatory.

INTENDED AUDIENCE

Developers of real-time virtual worlds, technical directors, researchers, and game developers who are looking for innovation as well as proven methodologies in simulating real-time virtual humans.

INSTRUCTORS

Nadia Magnenat-Thalmann
MIRALab, Université de Genève

Daniel Thalmann
VRlab, EPFL

MULTIPERSPECTIVE MODELING, RENDERING, AND IMAGING

★ ●

Thursday, 11 December, Tutorial

15:45–17:30

Level: Intermediate

A perspective image represents the spatial relationships of objects in a scene as they would appear from a single viewpoint. In contrast, a multiperspective image combines what is seen from several viewpoints into a single image. Despite their incongruity of view, effective multiperspective images can preserve spatial coherence and can depict, within a single context, details of a scene that are simultaneously inaccessible from a single view, yet easily interpretable by a viewer. In computer vision, multiperspective images have been used to analyse structure revealed via motion and generate panoramic images with a wide field of view using mirrors.

This tutorial provides a practical guide on topics in multiperspective modelling and rendering methods, and multiperspective imaging systems. It begins with a brief review of multiperspective image techniques frequently employed by artists. Illustrations include the visual paradoxes of Escher, the Cubism of Picasso and Braque, and multiperspective panoramas in cel-animations. The course characterises existing multiperspective camera models, with an emphasis on their underlying geometry and image properties, then demonstrates how to use these camera models for creating specific multiperspective rendering effects. The course includes demonstrations of several multiperspective imaging systems for extracting 3D geometry for computer vision.

PREREQUISITES

Basic understanding of camera operation, image processing, and machine vision.

INTENDED AUDIENCE

Digital artists, photographers, and computer graphics and computer vision researchers who use or build multiperspective cameras.

INSTRUCTOR

Jingyi Yu
University of Delaware

CG PRODUCTION PRINCIPLES: KEEPING YOUR MONEY ON THE SCREEN & OFF THE FLOOR

★ ●

Thursday, 11 December, Tutorial
13:45–15:30

Level: Intermediate

Are you satisfied with your production relationships, communication, adaptation, and high-quality delivery? Animation-industry veteran Kevin Geiger helps you analyse these questions with his unique organizational insight and signature presentation style. You will never look at your pipeline or your studio the same way again.

How much of your money makes it onto the screen? Got a leaky pipeline? Is your workflow trickling? Does your team approach work like a film, or like a science project? Can you roll with last-minute story changes? What economies of scale do you employ?

The global animation industry is as competitive as ever, with merciless markets, unforgiving audiences, and leaner profit margins. Yet independent and major productions alike seem content to burn through money (and people) as though they have resources to spare. This sort of waste is so pervasive in our industry that it is routinely acknowledged with a winking “you-know-how-production-is” acceptance. This attitude is not only irresponsible, it is also unsustainable. And it is easily addressed through insightful, considerate, and fearless assessment and action.

This course begins with an examination of the human factors and organizational considerations that are the foundation of all production (dys)function. Next, it covers workflow considerations and strategies, establishment (and erosion) of balance, common heuristic assumptions and errors,

and the importance of clarity and adaptation within the studio environment. A series of “Golden Rules” for production leads into the characteristics of a balanced pipeline, an overview of a robust non-linear production pipeline, and specific departmental examples. Finally, the course reviews asset management with an eye toward organization, flexibility, and transparency. The presentation concludes with a micro/macro view of the production paradigm, and the synergistic orchestration of these parts into a transcendent whole.

PREREQUISITES

A working understanding of CG production processes and terminology.

INTENDED AUDIENCE

Artists, supervisors, managers, producers, and executives.

INSTRUCTOR

Kevin Geiger
Animation Options LLC

DISCRETE DIFFERENTIAL GEOMETRY: AN APPLIED INTRODUCTION

★ ●

Friday, 12 December
08:30–17:30

Level: Advanced

This new and elegant area of mathematics has exciting applications, as this course demonstrates by presenting practical examples in geometry processing (surface fairing, parameterisation, and remeshing) and simulation (of cloth, shells, rods, and fluids).

The behavior of physical systems is typically described by a set of continuous equations using tools such as geometric mechanics and differential geometry to analyze and capture their properties. For purposes of computation, one must derive discrete (in space and time) representations of the underlying equations. Researchers in a variety of areas have discovered that theories, which are discrete from the start and have key geometric properties built into their discrete description, can often more readily yield robust numerical simulations that are true to the underlying continuous systems: they exactly preserve invariants of the continuous systems in the discrete computational realm.

This course introduces the nascent field of discrete differential geometry, laying out

fundamental concepts and surveying the exciting array of applications. It begins with a simple-to-follow presentation of discrete curves and discrete curvature. This backdrop introduces the overarching theme structure of preservation, which makes repeated appearances throughout the entire course. As the day proceeds, the course explores the question of which quantities one should measure on a discrete object such as a triangle mesh, and how one should define such measurements.

Following the introduction of the basic technical concepts, the course proceeds to investigate numerous exciting application areas. The lectures introduce and delve deeply into geometric modelling problems (including variational remeshing and parameterisation using discrete exterior calculus) and physical simulation of curves (such as elastic rods and hair), surfaces (such as cloth and thin-shells), and volumes (such as fluids). The emphasis is on understanding how structure preservation leads to simple and highly efficient implementations of important physical simulations.

PREREQUISITES

A working knowledge of vector calculus and elementary linear algebra. Optional prerequisites: some lectures may also assume some familiarity with physical simulation, geometry processing, and triangle and tetrahedral meshes. Recommended but not required: a basic understanding of continuous local differential geometry and classical mechanics.

INTENDED AUDIENCE

Graduate students, researchers, and application developers who seek a unified understanding of the mathematics underlying common geometry-processing operations and how these fundamentals apply to problems such as Laplacian smoothing, surface fairing using prescribed curvature flow, remeshing, conformal parameterisation, and cloth/shell/rod/fluid simulation.

INSTRUCTORS

Mathieu Desbrun
California Institute of Technology

Peter Schröder
California Institute of Technology

Max Wardetzky
Georg-August-Universität Göttingen

PARALLEL COMPUTING FOR GRAPHICS: BEYOND PROGRAMMABLE SHADING

★ ●

Friday, 12 December

08:30–17:30

Level: Beginner

This course provides an introduction to parallel-programming architectures and environments for interactive graphics and demonstrates how to combine traditional rendering API with advanced parallel computation.

There are strong indications that the future of interactive graphics involves a more flexible programming model than today's OpenGL/Direct3D pipelines. That means that graphics developers will need a basic understanding of how to combine emerging parallel-programming techniques with the traditional interactive rendering pipeline. The first half of the course introduces several parallel graphics architectures, programming environments, and the new types of graphics algorithms that will be possible. The second half presents case studies of how game developers, researchers, and graphics hardware vendors combine traditional rendering API techniques with advanced parallel computation. Each case study includes a live demo and discusses the mix of parallel-programming constructs used, details of the graphics algorithm, and how the rendering pipeline and computation interact to achieve the technical goals.

PREREQUISITES

Knowledge of general purpose programming languages.

INTENDED AUDIENCE

Developers interested in general purpose computing on the GPU.

INSTRUCTORS

Jason Yang
Advanced Micro Devices, Inc.

Justin Hensley
Advanced Micro Devices, Inc.

Tim Foley
Intel Corporation

Mark Harris
NVIDIA Corporation

Anselmo Lastra
University of North Carolina at Chapel Hill

Anjul Patney
University of California, Davis

Pedro V. Sander
Hong Kong University of Science and Technology

Jeremy Shopf
Advanced Micro Devices, Inc.

Kun Zhou
Zhejiang University

SEEING IN 3D

★ ●

Friday, 12 December

08:30–17:30

Level: Beginner

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

“Stand a cube on its corner. What is the shape of a horizontal cross-section taken at half the height of this object?” About four percent of human beings can reason about 3D space well enough to answer this question easily and with confidence. Most of us enter a state of panic when confronted by 3D problems. Yet it is possible to train yourself to think and visualize in 3D. This course helps attendees start thinking in 3D. Once they have the basic principles, they can develop the skill independently.

PREREQUISITES

Familiarity with some basic geometric ideas (for example, two planes meet in a straight line). Also helpful: awareness of how to find distances with Pythagoras' theorem, but this is used for only a few exercises, and the course can be understood without mathematics.

INTENDED AUDIENCE

Graphic artists, engineers, designers, computer graphics programmers, and students interested in graphics, drawing, or sculpture.

INSTRUCTORS

Geoff Wyvill
University of Otago

Bob Parslow
Independent Consultant

ADVANCED ILLUMINATION TECHNIQUES FOR GPU-BASED VOLUME RAY CASTING

★ ●

Saturday, 13 December

08:30–12:15

Level: Intermediate

In-depth instruction on advanced illumination techniques for volume ray casting implemented on the graphics processing unit (GPU). This course covers fast implementations of local and global illumination techniques for volume data and implicit surfaces, including ambient occlusion, deep shadow maps, and scattering effects.

Volume ray-casting techniques are important for both visual arts and visualisation. They support efficient generation of visual effects and visualisation of scientific data obtained by tomography or numerical simulation. Due to their flexibility, experts agree that GPU-based ray casting is the state-of-the-art technique for interactive volume rendering. It will most likely replace existing slice-based techniques in the near future. Volume rendering techniques are also effective for direct rendering of implicit surfaces used for soft-body animation and constructive solid geometry.

The course, which begins with a detailed introduction to the concepts behind GPU-based ray casting, focuses on advanced illumination techniques that approximate physically based light transport more convincingly. Such techniques include interactive implementation of soft and hard shadows, ambient occlusion, and simple Monte-Carlo based approaches to global illumination, including translucency and scattering.

With these techniques, users can interactively create convincing images from volumetric data whose visual quality goes far beyond traditional approaches. Using volume rendering techniques, artists who create medical visualisation for science magazines may now work on tomographic scans directly, without creating polygonal models of anatomical structures.

PREREQUISITES

A working knowledge of computer graphics and basic programming skills, familiarity with graphics hardware and shading languages, and basic knowledge of volume data and interactive volume-rendering techniques.

INTENDED AUDIENCE

The steadily growing number of developers who create specialized implementations of volume-rendering techniques on state-of-the-art graphics hardware.

INSTRUCTORS

Christof Rezk-Salama
Universität Siegen

Markus Hadwiger
VRVis Research Center for Virtual Reality and Visualization

Timo Ropinski
Westfälische Wilhelms-Universität Münster

Patric Ljung
Siemens Corporate Research

MODERN OPENGL: ITS DESIGN AND EVOLUTION

★ ●

Saturday, 13 December
13:45–17:30

Level: Intermediate

A long-time implementer of OpenGL and the system's original architect explain OpenGL's design and evolution. OpenGL's state machine is now a complex data flow with multiple programmable stages. In this course, OpenGL practitioners can expect candid design explanations, advice for programming modern GPUs, and insight into OpenGL's future.

OpenGL was conceived in 1991 to provide an industry standard for programming the hardware graphics pipeline. The original design has evolved considerably over the last 17 years. Whereas capabilities mandated by OpenGL such as texture mapping and a stencil buffer were present only on the world's most expensive graphics hardware in 1991, now these features are completely pervasive in PCs and are even available in several hand-held devices. Over that time, OpenGL's original fixed-function state machine has evolved into a complex data flow including several application-programmable stages. And the performance of OpenGL has increased from 100x to over 1,000x in many important raw graphics operations.

This course explains how the modern (post-2006) graphics hardware pipeline is exposed through OpenGL. Kurt Akeley presents his personal retrospective on OpenGL's development. Attendees learn nine ways to write better OpenGL

programs and how modern OpenGL implementations operate. In conclusion, the course assesses OpenGL's future evolution.

Whether you program with OpenGL or program with another API such as Direct3D, this course gives you new insights into graphics hardware architecture, programmable shading, and how to take maximum advantage of modern GPUs.

PREREQUISITES

Familiarity with the OpenGL graphics system. Familiarity with other graphics APIs such as Direct3D is helpful. The course assumes that attendees are familiar with concepts such as rasterization, shading, texturing, and vertex transformation.

INTENDED AUDIENCE

Graphics practitioners who want to better understand the modern 3D graphics hardware pipeline and its evolution as expressed through OpenGL. OpenGL programmers who want to learn how to update their programming practices to improve the performance and cross-platform portability of their OpenGL applications.

INSTRUCTORS

Mark Kilgard
NVIDIA Corporation

Kurt Akeley
Microsoft Research Silicon Valley

INTERACTIVE INTRODUCTION TO X3D GRAPHICS

★ ●

Saturday, 13 December
13:15–17:30

Level: Beginner

Extensible 3D (X3D) graphics is the open standard for 3D real-time communication on the web. X3D defines scene files that integrate network-enabled 3D graphics and multimedia. X3D applications are real-time, interactive, animated systems that can run stand-alone or in networked virtual environments. This tutorial focuses on the primary functionality of X3D including scene authoring, creation of geometry, web capabilities, designing animation chains, and user interaction.

Specific topics include animation design using interpolators and sequencers. The tutorial briefly examines embedded scripting, prototypes for extensibility, and various visualisation examples. Attendees learn

hands-on how to build an X3D world, and they have access to the latest X3D Showcase DVD, which contains a wide variety of free and commercial viewers, authoring tools, and example content.

PREREQUISITES

Understanding 3D scene graphs and 3D modelling is helpful but not required. X3D can be learned without prior programming experience.

INTENDED AUDIENCE

Beginning modellers, who will learn how to create simple 3D scene graphs with animation and user interactivity; experienced programmers, who will learn how their current knowledge can be expressed using a web standard for broader interoperability, and educators, who will learn how X3D can be used for introductory graphics courses.

INSTRUCTOR

Don Brutzman
Naval Postgraduate School

DEVELOPING AUGMENTED REALITY APPLICATIONS

★ ●

Saturday, 13 December
08:30–12:15

Level: Beginner

In this course, attendees learn how to use open source software to build their own augmented reality (AR) applications.

As computers become more and more invisible, AR (overlying virtual images on the real world) is becoming an increasingly important application area for computer graphics and user-interface design. This detailed introduction to AR interface design and research includes reviews of important topics such as tracking and registration, interaction techniques, design principles, and usability evaluation, as well as key areas for current and future AR research. Case studies are presented in the application areas of gaming, entertainment, medicine, and engineering. Part of the course also involves hands-on demonstrations where attendees will be able to experience the technology for themselves.

Significant portions of the course are devoted to reviewing the ARToolkit and osgART open-source software tools that can be used to start building AR applications, as well as other supporting software tools. After this course, attendees will understand the fundamentals of AR interface design,

the tools they can use to build AR applications, and how to evaluate them once they are built.

PREREQUISITES

Some programming experience is useful but not necessary. Also useful but not required: some experience with C/C++ programming and the OpenGL API.

INTENDED AUDIENCE

Academic and industrial researchers, and anyone interested in developing AR applications.

INSTRUCTORS

Mark Billinghurst
Human Interface Technology Laboratory
New Zealand

Raphaël Grasset
Human Interface Technology Laboratory
New Zealand

The SIGGRAPH Asia 2008 Technical Papers programme is a premier international forum for disseminating provocative and important new work in computer graphics and interactive techniques. Leading international experts from Asia and beyond present peer-reviewed research in rendering, modelling, animation, human-computer interaction, computer-aided design, virtual reality, and visualization.

This year also features SIGGRAPH Asia's first back-to-back Technical Papers Fast Forward Session. Get a preview of the latest research in computer graphics and interactive techniques and select the Technical Papers that you need to attend later in the week.

CONFERENCE REGISTRATION CATEGORIES

Technical Papers:

- ★ Full Conference Access
- One-Day Full Conference

Technical Papers Fast Forward Session:

- ★ Full Conference Access
- One-Day Full Conference
- Basic Conference/Exhibits Plus

Full Conference Access registration allows attendees access to all SIGGRAPH Asia 2008 Technical Papers. Seating is on a first-come, first-serve basis. Please be sure to arrive early for the Technical Papers sessions you wish to attend.

Thursday, 11 December

TECHNICAL PAPERS FAST FORWARD SESSION

★ ● ○

Wednesday, 10 December
18:00–20:00

SHAPE MODELLING

★ ●

Thursday, 11 December
08:00–10:15

SESSION CHAIR

Tao Ju

Single Image Tree Modelling

A simple and rapid method to generate a realistic 3D tree model from a single image.

Ping Tan

National University of Singapore

Tian Fang

Peng Zhao

Jianxiong Xiao

Long Quan

Hong Kong University of Science and Technology

Sketch-Based Tree Modelling Using Markov Random Field

A new system for converting a free-hand tree sketch into a full 3D model that is complex and realistic-looking. The problem is formulated as Markov random field.

Xuejin Chen

University of Science and Technology of China

Boris Neubert

Universität Konstanz

Ying-Qing Xu

Microsoft Research Asia

Oliver Deussen

Universität Konstanz

Sing Bing Kang

Microsoft Research Redmond

Space-Time Surface Reconstruction Using Incompressible Flow

This work deals with the problem of reconstructing watertight objects deforming across time. The process takes advantage of space-time coherence and adopts a global approach considering all frames simultaneously.

Andrei Sharf

Dan Anthony Alcantara

University of California, Davis

Thomas Lewiner

Pontifícia Universidade Católica do Rio de Janeiro

Chen Greif

Alla Sheffer

The University of British Columbia

Nina Amenta

University of California, Davis

Daniel Cohen-Or

Tel-Aviv University

Non-Homogeneous Resizing of Complex Models

Resizing of 3D models can be very useful when creating new models or placing models inside different scenes. However, straightforward nonuniform scaling can destroy features and lead to serious visual artifacts. This paper introduces a method that resizes 3D models in an intuitive way, protecting model features and structure.

Vladislav Kraevoy

Alla Sheffer

The University of British Columbia

Ariel Shamir

Interdisciplinary Center Herzliya

Daniel Cohen-Or

Tel-Aviv University

Mesh Ensemble Motion Graphs: Data-Driven Mesh Animation With Constraints

This approach to data-driven animation of high-dimensional mesh ensembles, such as tree-structured botanical models, proposes a randomized space-time optimization algorithm for precomputing smooth asynchronous transitions that also avoid introducing non-physical self-collisions.

Doug L. James

Christopher D. Twigg

Andrew Cove

Robert Y. Wang

Cornell University

CHARACTER ANIMATION I



Thursday, 11 December
13:45–15:30

SESSION CHAIR
Subodh Kumar

Animating Responsive Characters With Dynamic Constraints in Near-Unactuated Coordinates

An approach to animating physically responsive virtual characters by combining kinematic pose control with dynamic constraints in the muscle-actuation space.

Yuting Ye
C. Karen Liu
Georgia Institute of Technology

Synthesis of Constrained Walking Skills

A flexible framework for locomotion that enables physically simulated characters to navigate across terrains with gaps and other stepping constraints.

Stelian Coros
KangKang Yin
Philippe Beaudoin
Michiel van de Panne
The University of British Columbia

Interaction Patches for Multi-Character Animation

A method to generate large-scale character animation, such as a character fighting with many enemies, and a crowd passing luggage one after another in a warehouse.

Hubert P.H. Shum
Taku Komura
University of Edinburgh

Masashi Shiraishi
Waseda University

Shuntaro Yamazaki
National Institute of Advanced Industrial Science and Technology

Motion Overview of Human Actions

A method for generating overview videos based on the analysis of motion capture data.

Jackie Assa
Daniel Cohen-Or
Tel Aviv University

I-Cheng Yeh
Tong-Yee Lee
National Cheng Kung University

FUN WITH SINGLE IMAGES



Thursday, 11 December
15:45–18:00

SESSION CHAIR
Kang Sing Bing

Deep Photo: Model-Based Photograph Enhancement and Viewing

A novel method for browsing, enhancing, and manipulating outdoor photographs by combining them with existing geo-referenced digital terrain and urban models.

Johannes Kopf
Universität Konstanz

Dani Lischinski
The Hebrew University

Daniel Cohen-Or
Tel Aviv University

Boris Neubert
Oliver Deussen
Universität Konstanz

Michael Cohen
Matt Uyttendaele
Microsoft Research

Billy Chen
Microsoft Research

Animating Animal Motion From Still Images

A novel technique to infer and animate animal motions from a still image.

Xuemiao Xu
Liang Wan
Xiaopei Liu
Tien-Tsin Wong
Liansheng Wang
The Chinese University of Hong Kong

Chi-Sing Leung
City University of Hong Kong

Optimised Scale-and-Stretch for Image Resizing

An image-resizing method that computes an optimal scaling transformation for each local region, such that the aspect ratios of the automatically detected prominent features are preserved.

Yu-Shuen Wang
National Cheng Kung University

Chiew-Lan Tai
The Hong Kong University of Science and Technology

Olga Sorkine
New York University

Tong-Yee Lee
National Cheng Kung University

Interactive Normal Reconstruction From a Single Image

An interactive approach for reconstructing surface normals of an object in a single image: interactive shape-from-shading and rotation palettes, which allow easy and intuitive manipulation using relative normals.

Tai-Pang Wu
Jian Sun
Microsoft Research Asia

Chi-Keung Tang
Hong Kong University of Science & Technology

Heung-Yeung Shum
Microsoft Research Asia

Depicting Procedural Caustics in Single Images

A powerful technique to simulate and approximate caustics in images. The algorithm is designed to produce excellent results without the need to painstakingly paint over pixels.

Diego Gutierrez
Jorge Lopez-Moreno
Jorge Fandos
Francisco J. Seron
Maria P. Sanchez
Universidad de Zaragoza

Erik Reinhard
University of Bristol

CHARACTER ANIMATION II



Friday, 12 December
08:00–10:15

SESSION CHAIR

Doug James

Facial Performance Synthesis Using Deformation-Driven Polynomial Displacement Maps

A method for acquiring, modelling, compressing, and synthesizing realistic detailed facial deformations using polynomial displacement maps driven by coarse motion capture markers.

Wan-Chun Ma
University of Southern California, National Taiwan University

Andrew Jones
Jen-Yuan Chiang
Tim Hawkins
Sune Frederiksen
Pieter Peers
University of Southern California

Marko Vukovic
Sony Pictures Imageworks

Ming Ouhyoung
National Taiwan University

Paul Debevec
USC Institute for Creative Technologies

Reusable Skinning Templates Using Cage-Based Deformations

A skinning template abstraction that makes it easy to design and transfer skin deformation styles.

Tao Ju
Washington University in St. Louis

Qian-Yi Zhou
University of Southern California

Michiel van de Panne
The University of British Columbia

Daniel Cohen-Or
Tel Aviv University

Ulrich Neumann
University of Southern California

Accelerometer-Based User Interfaces for the Control of a Physically Simulated Character

User study of three Wiimote interfaces for controlling a physically simulated character.

Takaaki Shiratori
Jessica Hodgins
Carnegie Mellon University

Video Puppetry: A Performative Interface for Cutout Animation

A video-based interface for creating animations by puppeteering.

Connelly Barnes
Princeton University

David Jacobs
University of California, Berkeley

Jason Sanders
NVIDIA Corporation

Dan Goldman
Adobe Systems Incorporated

Szymon Rusinkiewicz
Adam Finkelstein
Princeton University

Maneesh Agrawala
University of California, Berkeley

Laughing Out Loud: Control for Modelling Anatomically Inspired Laughter Using Audio

A novel technique for generating animation of laughter, including an audio-controlled method that automatically creates an animation from a soundtrack of an individual laughing.

Paul DiLorenzo
Victor Zordan
Benjamin Sanders
University of California, Riverside

LIGHTING, SHADING, AND GPUS



Friday, 12 December
08:00–10:15

SESSION CHAIR

Nelson Max

Real-Time KD-Tree Construction on Graphics Hardware

The first real-time algorithm for constructing kd-trees on GPUs and its potential in GPU ray tracing, photon mapping, and point-cloud modelling.

Kun Zhou
Zhejiang University

Qiming Hou
Tsinghua University

Rui Wang
Zhejiang University

Baining Guo
Microsoft Research Asia

Automated Reprojection-Based Pixel Shader Optimisation

This paper presents a set of techniques for automating the use of data reprojection as a general strategy for optimising procedural shaders.

Pitchaya Sitthi-amorn
Jason Lawrence
University of Virginia

Lei Yang
Pedro Sander
Hong Kong University of Science and Technology

Diego Nehab
Microsoft Research

Jiahe Xi
Hong Kong University of Science and Technology

Fast, Realistic Lighting and Material Design Using Nonlinear Cut Approximation

An algorithm for efficient computation with cut approximations and an application for interactive lighting and material design under complex illumination with arbitrary BRDFs and per-pixel shading.

Ewen Cheslack-Postava
Stanford University

Rui Wang
Oskar Akerlund
University of Massachusetts Amherst

Fabio Pellacini
Dartmouth College

Imperfect Shadow Maps for Efficient Computation of Indirect Illumination

A method for interactive computation of indirect illumination in large and fully dynamic scenes. It is based on approximate visibility encoded in imperfect shadow maps.

Tobias Ritschel
Thorsten Grosch
Max Planck Institut für Informatik

Min H. Kim
University College London

Hans-Peter Seidel
Max Planck Institut für Informatik

Carsten Dachsbacher
Universität Stuttgart

Jan Kautz
University College London

Progressive Photon Mapping

A new formulation of photon mapping for computing global illumination with progressive refinement.

Toshiya Hachisuka
University of California, San Diego

Shinji Ogaki
The University of Nottingham

Henrik Wann Jensen
University of California, San Diego

IMAGE-BASED CAPTURE

★ ●

Friday, 12 December
10:30–12:15

SESSION CHAIR

Chi-Keung Tang

Shield Fields: Modelling and Capturing 3D Occluders

Decoupling 3D occluders from 4D illumination using shield fields, then analysing occluder reconstruction from cast shadows, leading to a single-shot light-field camera for visual hull reconstruction.

Douglas Lanman
Mitsubishi Electric Research Laboratory, Brown University

Ramesh Raskar
MIT Media Lab, Mitsubishi Electric Research Laboratory

Amit Agrawal
Mitsubishi Electric Research Laboratory

Gabriel Taubin
Brown University

Time-Resolved 3D Capture of Non-Stationary Gas Flows

A new method for capturing dynamic gas flows in 3D.

Bradley Atcheson
Ivo Ihrke
Wolfgang Heidrich
The University of British Columbia

Art Tevs
Max Planck Institut für Informatik

Derek Bradley
The University of British Columbia

Marcus Magnor
Braunschweig Technical University

Hans-Peter Seidel
Max Planck Institut für Informatik

A Photometric Approach for Estimating Normals and Tangents

A photometric approach that estimates surface orientation and the directions of principle light scattering based on symmetries in the BRDF.

Michael Holroyd
Jason Lawrence
Greg Humphreys
University of Virginia

Todd Zickler
Harvard University

Extracting Depth and Matte Using a Color-Filtered Aperture

This method automatically extracts a scene-depth map and the alpha matte of a foreground object by capturing a scene through RGB color filters placed in the camera lens aperture.

Yosuke Bando
Toshiba Corporation, The University of Tokyo

Bing-Yu Chen
National Taiwan University

Tomoyuki Nishita
The University of Tokyo

TEXTURE

★ ●

Friday, 12 December
13:45–15:30 pm

SESSION CHAIR

Johannes Kopf

Random-Access Rendering of General Vector Graphics

An efficient representation for random-access anti-aliased vector graphics on the GPU, consisting of a lattice of cell-specialised variable-length descriptions.

Diego Nehab
Hugues Hoppe
Microsoft Research

Texture Amendment: Reducing Texture Distortion in Constrained Parameterisation

This paper describes an approach that combines the benefits of constrained parameterisation and low-distortion parameterisation to reduce texture distortion.

Yu-Wing Tai
Michael Brown
National University of Singapore

Chi-Keung Tang
Hong Kong University of Science & Technology

Heung-Yeung Shum
Microsoft Research Asia

IGT: Inverse Geometric Textures

A parameterisation-independent texturing technique that allows preservation of texture details from a high resolution reference model onto lower resolutions, generated with any given simplification method.

Gustavo Patow
Ismael García
Universitat de Girona

A Psychophysically Validated Metric for Bidirectional Texture Data Reduction

Psychophysical experiments show that optimal bidirectional texture function compression parameters are material dependent. This paper proposes a psychophysically validated metric that estimates these parameters and provides a predefined perceptual quality.

Jiri Filip
Michael Chantler
Patrick Green
Heriot-Watt University

Michal Haindl
Institute of Information Theory and Automation of the ASCR

REFLECTANCE & SUBDIVISION

★ ●

Friday, 12 December
15:45–18:00

SESSION CHAIR

Kun Zhou

Practical Modelling and Acquisition of Layered Facial Reflectance

A practical method for modelling layered facial reflectance from a modest number of photographs recorded from a single viewpoint.

Abhijeet Ghosh
Paul Debevec
Tim Hawkins
Pieter Peers
Sune Frederiksen
USC Institute for Creative Technologies

A Layered, Heterogeneous Reflectance Model for Acquiring and Rendering Human Skin

A layered, heterogeneous, spectral reflectance model for acquiring and rendering the appearance of human skin. The model measures appearance via a novel acquisition method that uses multi-spectral photographs.

Craig Donner
Columbia University

Tim Weyrich
University College London

Eugene d'Eon
NVIDIA Corporation

Ravi Ramamoorthi
Columbia University

Szymon Rusinkiewicz
Princeton University

Phong Tessellation

The Phong Tessellation is a geometric version of the Phong normal interpolation to improve the visual continuity of meshes with a local curved displacement, adapted to current and next-generation GPUs.

Tamy Boubekeur
Marc Alexa
Technische Universität Berlin

Subdivision Shading
Rendering subdivision surfaces using normals generated by subdivision.

Marc Alexa
Tamy Boubekeur
Technische Universität Berlin

Real-Time Reyes-Style Adaptive Surface Subdivision

An efficient and real-time Reyes-like surface subdivision (split/dice) using modern GPGPU techniques that subdivides complex models to subpixel accuracy in a few milliseconds.

Anjul Patney, John Owens
University of California, Davis

MESH PROCESSING

★ ●

Saturday, 13 December
08:00–10:15

SESSION CHAIR

Olga Sorkine

Efficient Traversal of Mesh Edges Using Adjacency Primitives

Efficient edge traversal allows fast shadow volumes and silhouette computations on the GPU. Minimising the number of adjacency primitives leads to discrete optimizations on the mesh dual graph.

Pedro Sander
Hong Kong University of Science & Technology

Diego Nehab
Microsoft Research

Eden Chlamtac
Princeton University

Hugues Hoppe
Microsoft Research

Randomised Cuts for 3D Mesh Analysis

This paper investigates a new shape analysis method based on randomised cuts of 3D surface meshes.

Aleksey Golovinskiy
Thomas Funkhouser
Princeton University

Deduction of Interpolating Subdivision Schemes From Approximating Subdivision Schemes

A method for directly deducing new interpolating subdivision schemes from the corresponding approximations. The purpose is to solve some limitations in the exiting interpolating subdivision.

Shujin Lin
Xiaonan Luo
Fang You
Zheng Li
Sun Yat-sen University

Spectral Quadrangulation With Orientation and Alignment Control

A new algorithm for quad mesh generation based on a spectral surface quadrangulation approach that provides flexible explicit control of the shape, size, orientation, and feature alignment of the quad faces.

Jin Huang
Muyang Zhang

Jin Ma
Xinguo Liu
Zhejiang University

Leif Kobbelt
RWTH Aachen

Hujun Bao
Zhejiang University

Quadrilateral Mesh Simplification

Mesh simplification is an important geometric-processing algorithm, serving as a building block for many higher-level methods. This paper introduces a quadrilateral mesh-simplification technique, constructing quality LOD mesh hierarchies.

Joel Daniels
Claudio Silva
University of Utah

Jason Shepherd
Sandia National Laboratories

Elaine Cohen
University of Utah

COLOURISATION & UPSAMPLING

★ ●

Saturday, 13 December
08:00–10:15

SESSION CHAIR

Marc Pollefeys

A Virtual Restoration Stage for Real-World Objects

A system to virtually restore damaged or historically significant objects without needing to physically change the object in any way.

Daniel Aliaga
Alvin Law
Yu-Hong Yeung
Purdue University

Superimposing Dynamic Range

A cost-efficient way of extending contrast, perceived tonal resolution, and color space of static hardcopy images, beyond the capabilities of hardcopies or low-dynamic-range displays alone.

Oliver Bimber
Bauhaus Universität Weimar

Daisuke Iwai
Osaka University

VirtualStudio2Go: Digital Video Composition for Real Environments

Synchronised film cameras, video projectors, and high-speed LED lighting, together with radiometric image correction, enable professional digital video composition effects in real environments without the constraints of virtual studios.

Anselm Grundhoefer
Oliver Bimber
Bauhaus Universität Weimar

Intrinsic Colourisation

An example-based colourisation technique robust to illumination differences between grayscale target and color-reference images.

Xiaopei Liu
Liang Wan
Yingge Qu
Tien-Tsin Wong
The Chinese University of Hong Kong

Stephen Lin
Microsoft Research Asia

Chi-Sing Leung
City University of Hong Kong

Pheng-Ann Heng
The Chinese University of Hong Kong

Fast Image/Video Upsampling

A simple yet effective upsampling method for automatically enhancing image/video resolution, while naturally preserving the structural information and temporal coherence.

Qi Shan
Zhaorong Li
Jiaya Jia
The Chinese University of Hong Kong

Chi-Keung Tang
Hong Kong University of Science & Technology

NON-PHOTOREALISTIC RENDERING

★ ●
Saturday, 13 December
10:30–12:15

SESSION CHAIR
Ken Anjyo

Adaptive Cutaways for Comprehensible Rendering of Polygonal Scenes
Generating cutaway renderings of

polygonal models at interactive frame rates, using illustrative and non-photorealistic rendering cues to expose objects of interest in the context of nearby and enclosing objects

Michael Burns
Adam Finkelstein
Princeton University

Richness-Preserving Manga Screening

A novel method for screening manga-style drawings from photographs, by preserving the tone similarity, texture similarity, and chromaticity distinguishability.

Yingge Qu
Wai-Man Pang
Tien-Tsin Wong
Pheng-Ann Heng
The Chinese University of Hong Kong

Line-Art Illustration of Dynamic and Specular Surfaces

A real-time rendering system that can illustrate dynamic 3D models in line-art styles. The system can also illustrate reflections and refractions on specular surfaces.

Yongjin Kim
Pohang University of Science & Technology

Jingyi Yu
Xuan Yu
University of Delaware

Seungyong Lee
Pohang University of Science & Technology

Demarcating Curves for Shape Illustration

This paper defines a new class of view-independent curves (demarcating curves) and proves relations between them and other well-known curves. Their application to archaeological artifact illustration is demonstrated.

Michael Kolomenkin
Technion–Israel Institute of Technology

Ilan Shimshoni
University of Haifa

Ayellet Tal
Technion–Israel Institute of Technology

URBAN MODELLING

★ ●
Saturday, 13 December
13:45–15:30

SESSION CHAIR
Tong Xin

Continuous Model Synthesis

A novel method for procedurally modelling large complex shapes. The approach is general-purpose and accepts as input any 3D polyhedral model provided by a user.

Paul Merrell
Dinesh Manocha
University of North Carolina at Chapel Hill

Interactive 3D Architectural Modelling From Unordered Photo Collections

An interactive image-based modelling system for architectural scenes that leverages recent advances in automatic computer vision techniques and sketch-based 3D modelling and handles large photo collections.

Sudipta Sinha
University of North Carolina at Chapel Hill

Drew Steedly
Microsoft Live Labs

Richard Szeliski
Microsoft Research

Maneesh Agrawala
University of California, Berkeley

Marc Pollefeys
ETH Zürich, University of North Carolina at Chapel Hill

Interactive Example-Based Urban Layout Synthesis

An interactive system for synthesising urban layouts by example. New urban layouts are inferred from the road network, parcel data, and aerial images of given cities.

Daniel Aliaga
Carlos Vanegas
Bedrich Benes
Purdue University

Image-Based Façade Modelling

A semi-automatic image-based approach to building façade modelling from automatically recovered cameras and 3D points of a sequence of images.

Jianxiong Xiao
Tian Fang
Hong Kong University of Science & Technology

Ping Tan
National University of Singapore

Peng Zhao
Hong Kong University of Science & Technology

Eyal Ofek
Microsoft Corporation

Long Quan
Hong Kong University of Science & Technology

PHYSICALLY BASED ANIMATION

★ ●

Saturday, 13 December
15:45–18:00

SESSION CHAIR

Hyeong-Seok Ko

Magnets in Motion

A method for magnetic interaction in rigid-body simulation, allowing interactive simulation of dozens of magnets. The approach is physically sound and has excellent accuracy and preservation properties.

Bernhard Thomaszewski
Andreas Gumann
Simon Pabst
Wolfgang Strasser
Universität Tübingen

Real-Time Control of Physically Based Simulations Using Gentle Forces

Real-time control with gentle forces cooperates with natural dynamics to generate simulations that are fast, compliant, and directable.

Jernej Barbic
Jovan Popović
Massachusetts Institute of Technology

Staggered Projections for Frictional Contact in Multibody Systems

A discrete, velocity-level formulation of frictional-contact dynamics that enables a

novel and accurate algorithm for frictional-contact resolution based on a simple staggered sequence of projections.

Danny Kaufman
Shinjiro Sueda
The University of British Columbia

Doug James
Cornell University

Dinesh Pai
The University of British Columbia

Optimising Cubature for Efficient Integration of Subspace Deformations

Cubature optimisation enables fast evaluation of subspace internal forces associated with subspace deformations of models with complex geometry, nonlinear deformations, and nonlinear hyperelastic materials.

Steven An
Theodore Kim
Doug James
Cornell University

Fast Animation of Turbulence Using Energy Transport and Procedural Synthesis

A novel technique for animation of turbulent fluids by coupling a procedural turbulence model with a numerical fluid solver to introduce subgrid-scale flow detail.

Rahul Narain
Jason Sewall
University of North Carolina at Chapel Hill

Mark Carlson
DreamWorks Animation

Ming Lin
University of North Carolina at Chapel Hill

Envisioned as an international gathering of industry professionals and academics, the Educators Programme presents perspectives that appeal to a wide spectrum of interests. The goal is to share educational strategies adopted in both industry and academia to make the learning process more satisfying, productive, and meaningful.

CONFERENCE REGISTRATION CATEGORIES

- ★ Full Conference Access
- One-Day Full Conference

Thursday, 11 December

METHODOLOGIES IN LEARNING



Thursday, 11 December

08:30–10:15

Educators Papers

SESSION CHAIR:

Mark Chavez

Computer Graphics in Context: An Approach to a First Course in Computer Graphics

This paper discusses the concept of teaching a first course in computer graphics that includes a context - a field outside computer graphics in which graphics is used - in order to engage students and broaden their understanding of the graphics principles. The paper presents a specific example, a course in computer science, where creating an engagement with a wider topic is known to improve student learning.

Steve Cunningham
Brown Cunningham Associates

Using Augmented Reality to Promote Understanding of Materials Science to School Children

Using tables of data to understand and compare their properties is a rather boring and unintuitive way to learn about materials. Children learn much more quickly and intuitively if they can touch the materials they are learning about and link them directly to their properties and applications. But such an approach can be very demanding on teachers' knowledge and attention, especially in large classes.

The challenge is to engage pupils by

exploiting information and communication technology to aid the learning process. If this approach can build on their interest in animations and exciting graphics, developed through their exposure to television and computer games, then so much the better. Kids rarely read the instructions when playing computer games, since they adopt intuitive protocols.

Augmented reality (AR) is a relatively mature technology, but so far it remains largely undiscovered by schools as a means of enhancing traditional lesson delivery. The advantage of AR is its ability to overlay information on real physical objects as viewed on a LCD projector or interactive white board. This paper describes a set of educational AR software for helping children to familiarise themselves with simple physics, chemistry, and materials principles.

AR technology brings photographic and computer-generated images into real environments, facilitating real-time 3D interactions connected to physically available objects. The tools developed in this project comprise four major kinds of applications, each designed to help pupils learn about materials and their applications. The linkages between the hands-on materials and their properties and applications are explored through a series of puzzles, games, and tasks, with the AR providing intuitive guidance. For example, pupils can try to identify the materials required to build a jet engine or play a "top trumps" game with the computer to choose attributes for their materials that could outperform the materials chosen by the computer. The AR system also acts as a virtual microscope to reveal the microstructure of a given

material as it is placed under the web-cam. For younger pupils, the school can use a simpler AR tool to learn about the categorisation of materials (metal, ceramic, polymer, and natural). The AR recognition software rewards correct allocations and helps pupils to identify mistakes.

This paper outlines development and deployment of AR and discusses evaluations that will be carried out with teachers and pupils during exhibitions at the Farnborough Air Show, the Manchester Science Festival, and schools visits. The goal is to provide a valuable starting point for other AR developments in educational settings.

Kevin Tan
Emma Lewis
University of Manchester

Nick Avis
Cardiff University

Philip Withers
University of Manchester

Simulating Educational Physical Experiments in Augmented Reality

This paper presents PhysicsPlayground, an augmented reality application that utilizes a recent physics engine developed for the PC gaming market to simulate physical experiments in mechanics in real time. Students are able to actively build their own experiments and study them in a three-dimensional virtual world. Several tools are provided to analyze forces, mass, paths, and other properties of objects before, during, and after experiments. Innovative teaching content exploits the strengths of this immersive virtual environment. PhysicsPlayground is an example

of how current technologies can be combined to deliver new experiences in physics education.

Hannes Kaufmann
Bernd Meyer
Technische Universität Wien

EDUCATORS PROGRAMME RAMP-IN AND KEYNOTE ADDRESS

★ ●
Thursday, 11 December
13:45–15:30
Educators Paper

Ramp-In: Welcome and Overview
of Programme by Programme Chair
Mark Chavez

The New Perspective of Consilience
of the Arts and Technology in the
Era of Ubiquitous Computing

EDUCATORS KEYNOTE ADDRESS

Ubiquitous Arts & Technology (U-AT)
Consilience Education is a new term
coined by the Korea National University of
Arts to refer to consilience of ubiquitous
computer technology and diverse arts
genres in a narrow sense, and consilience
of the arts, humanities, and technology in
a broader sense. In this sense, consilience
refers to a non-reductionist unity of knowl-
edge, unlike the reductionist consilience in
the humanist biology of Edmund Wilson.

The term, coined by William Whewell in
the early 19th century, is a revival of the
Latin word *consalier*, which means “varied
branches uniting and jumping together to
form a unified trunk.” According to the sci-
ence of complex systems, the process of
mixing different elements, and their interac-
tions, are critical requirements for creative
experience and knowledge creation.

The key objective of U-AT Consilience Edu-
cation is to establish a creative education
system to produce quality content in multi-
source-multi-use mode by institutionalizing
the cooperative ties between industry and
the university for joint research projects,
creative endeavors, and education. The
overall purpose is to promote continuous
and systematic communications and con-
silience of six artistic genres: music, drama,
film-TV-multimedia, visual arts, dance, and
Korean traditional arts.

Park Se-Hyung
Korea National University of Arts

METHODOLOGIES IN LEARNING

★ ●
Thursday, 11 December
15:45–17:30
Educators Papers

SESSION CHAIR:
Martin Constable

Shift to The Third Space - isAT 2008

The arts and technology are no longer
strangers. They are forging a closer
partnership, as the arts reveal what could
previously exist only in our imaginations
by utilizing ubiquitous technology, and
technology, in turn, leaps over the modern
era by adding a wing of artistic sensibility
to science.

In light of this shift, isAT 2007 (International
Symposium for Arts and Technology 2007)
was held last year to explore the “Lightning
Effects” from the encounter between the
arts and technology. Under the theme of
Shift to the Third Space, the upcoming
event, isAT 2008, will seek the meaning of
the union of the arts and technology and
explore how ubiquitous computing technol-
ogy shifts our lives into other dimensions.

Shim Kwang-Hyun
Korea National University of Arts

The Animation Solution Kit

The main benefit of independent creation
is not cost reduction but quality. In the
process of indie-creation, concept art can
be retained until final step because it’s
mainly created by a small, efficient team.
By expanding the traditional concept of
“animation,” DMMG Lab makes a “proto-
type model” for animation based on NPR
and, by building a library of models, materi-
als, motion, and effect sources, facilitates
a “stand-alone on network,” which enables
one person to manage the entire animation
process.

Lee Jungmin
Korea National University of Arts

Making Intelligent Sounds

An intelligent sound is a sound that can
think. It can create, modify, evolve, and
even kill itself according to its environment.
This paper shows two approaches to this
concept. One is creative and experimental
(the author’s compositions), and the other
is practical and educational (the Intelligent
Sound Lab at The Korean National Univer-
sity of Arts).

The Intelligent Sound Lab develops basic
technologies and solutions for synthe-
sis of realistic sound effects that can be
automatically synthesized according to the
recorded or analyzed meta-data of various
media content. The main objective of this
lab is to develop and build an “intelligent
sound library” of sound-effect algorithms
that can create and vary themselves ac-
cording to their content.

Chang, Jaeho
Korea National University of Arts

GAME EDUCATION

★ ●
Friday, 12 December
08:30–10:15
Educators Papers

SESSION CHAIR:
Gao Wei Hua

Creating a Multi-Disciplinary Gaming Curriculum: Avoiding Mistakes, Missteps, and Growing Pains

While the volume of game-development
curricula has grown dramatically over
the past five years, there is still relatively
little information on the proliferation of
these programmes. At Drexel University,
game development has grown from a few
unrelated, area-specific courses to become
a truly multi-disciplinary, multi-course
sequence that unifies the foundation
skills of several departments and colleges
across the university. Yet there have been
numerous challenges and changes during
the four-year evolution of this sequence.
This paper documents the growth of the
programme, the problems it encountered,
and the solutions developed, in the hope
that it can serve as a road map for other
institutions.

At Drexel, game development does not
“live” in one department, so it mirrors the
true nature of game development in com-
mercial settings. Game development is
offered in a coordinated, cross-listed series
of courses in both the computer science
(CS) and digital media (DIGM) majors,
and production courses are open to other
majors as well. Computer science courses
teach foundation software-development
skills and offer software design courses for
prototyping game concepts. Drexel’s digital
media major is one of the oldest such pro-
grammes in the United States. It instructs
students on the foundation skills of design,
art, programming, modelling, animation,
audio and video production, and the use of

industry tools such as Maya and 3ds Max. The gaming courses and projects bring these two majors together, with the additional participation of students and faculty from other majors including music, music industry, screenwriting and playwriting, engineering, and business.

Many problems were encountered during the programme's growth from an original two-course sequence to the current nine-course offering including: cultural and communication differences between the different majors; scheduling differences across programmes, departments, and colleges; teaching and staffing issues; course sequencing issues; introduction of soft-skill techniques; project management issues; student and staff turnover; rapidly changing technology platforms; lack of adequate texts; software and hardware access issues; and even educating administrators and parents as to what game development entails.

The gaming sequence is designed to reflect the nature of the industry and industry demands and practices. For example, the programme makes heavy use of the iterative development cycle and SCRUM methodology. However, introduction of these techniques provides unique challenges in classroom settings, where students have always been able to "get by" with less-formal structures, or where grades are based on a final submission.

The cross-discipline nature of the course offerings presents logistical challenges for reaching and informing interested students and researchers, and has led to formation of the Drexel RePlay Lab web site.

The 2007-2008 academic year was the first in which the complete complement of courses was fully offered. Despite this, the student work produced from even an abridged offering has been very impressive.

Paul Diefenbach
Drexel University

Sharing the Magic Circle With Spatially Inclusive Games

A discussion of innovative (capstone) projection environments at an IT and electrical engineering school. The overarching brief was to develop both more expansive and immersive viewing and playing environments. Game courses were used as a springboard to extend the students' creative and critical design thinking in relation to wider interaction-design issues. Imaginative combinations of game engines

and peripherals were also used as initial prompters to encourage students to go beyond current game-theory definitions, explore how to increase the player's sense of embodiment, and transmit the player's gameplay experience to a wider audience. The resulting prototypes are being incorporated into future versions of CAVE UT to help educators develop more engaging and immersive interactive environments. Hopefully, the next version of CAVE UT will also allow players and audiences to share the so-called "magic circle."

Erik Champion
The University of New South Wales

Jeffrey Jacobson
PublicVR

Gaming: Back to the Basics

By recreating basic games, this presentation returns to the basics of computer games and experiments with game play, game rules, and players' psychology. It surveys 2D and 3D games designed as experimental prototypes of "treasure hunting," "plateau," and generic "Space Invaders" and "Pac Man" games, and it shows how player experience can be affected by slight changes in game mechanics.

The exploration of game play takes place inside 2D and 3D versions of basic games created by students and professionals during workshops with limited-time assignments. Creators of these games reshape behaviours and relationships governing levels, modes, rules, choices, classes of objects, characters, and interactive elements. They experiment with game play and rules, following the psychology of the players and demonstrating the need to be not too simple and not too complex.

Topics covered in this presentation include how small variations of the elements of game design can affect the game-playing experience, how the architecture of a game can repeat from one game to the other and in different times and contexts, how the player is placed in the center of the gaming experience, and how choices are presented to the player.

The presentation also shows how to create an interactive interface that allows real-time testing of dynamic transformations of game mechanics and rules of play. The audience uses Wiimotes to participate in demos that focus on side-by-side evaluation of basic 2D games and their recreation as 3D games. It also surveys examples of authoring tools, interactive animations, and

behavioural engines available for education (Torque, Virtools, XNA).

Jean-Marc Gauthier
*Tisch School of the Arts Asia,
New York University*

THE MINDSPACE OF LEARNING



Friday, 12 December
10:30-12:15
Educators Papers

SESSION CHAIR:
Ayumi Miyai

Practice Project Management in Web Site Design: An Experiential Learning Simulation

The current literature suggests that experiential learning is a necessary component of formal instruction in higher education. But research on experiential learning in web site design development and management is minimal. The purpose of this project is to detail research on how to blend experiential learning principles with project management into an actual case of web site design practice for the new age of electronic learning.

Art and design faculties are no strangers to experiential learning. One cannot learn the complexities of the design discipline without extensive design studio projects. Where experiential learning is well integrated, students demonstrate a greater understanding of the complexity of real-world problems. By combining theory with practice, this project helps the academic community understand the relationships among education, work, and technology. It also provides rich dialogues about students' experiential learning, which helps them build a foundation for professional life in the real world. In this approach, the "process" is as important as the "product." This study hopes to stimulate further work in this area.

Mei-Fen Chen
Robert Morris College

Guitar Man

This paper proposes a game system that presents a cooperative musical performance system using guitar and bass guitar. Because the bass guitar does not necessarily support fast playing, it is suited to the subject of this study. However, it is necessary to accelerate the speed of a pitch-detection algorithm in order to extend it to a cooperative musical performance

system that includes other non-string instruments. A constant time interval should be maintained due to the fact that it is difficult to apply a pitch-detection process for specific tones when the recognition time is reduced.

This study considers how new musical possibilities can be achieved through online networks by overcoming the stereotypes in off-line musical activities, such as music-instrument lessons or traditional cooperative performances. It is based on the assumption that the future computer game industry will not be developed as a simple virtual reality but an actual systems like the cooperative musical performance system proposed in this paper.

Aram So
Sogang University

METHODOLOGIES IN LEARNING



Friday, 12 December
15:45–17:30
Educators Panels

SESSION CHAIR:
Russell Pensyl

Bridging the Gap Between Education and Professional Production

While there is a global interest in learning animation and special effects, the quality of academic programmes and training ranges from excellent to mediocre. It takes time and a great deal of skill, knowledge, and talent to develop global-quality education that meets the needs of today's production companies, and the bar is raised higher every year.

In too many countries, get-rich-quick institutions advertise software training that at best provides comprehensive coverage of tool sets and techniques, and at the worst, certifies students who are completely unprepared for the careers they seek and with little or no knowledge of anything but the basic operation of a popular software programme.

Some countries have 500 or even 1,000 animation programmes (China for example) yet few have instructors who have worked and excelled in the industry. In addition, many instructors have received little or no training in effective and meaningful instructional techniques. The inevitable result: the quality of education is often very low, and graduates are completely unprepared for

the career paths they want to follow.

As there is no professional certification for animators or visual effects professionals, it's time to move toward a universally acceptable framework for specifying and evaluating the skills, portfolios, and show reels that are the fundamental entry point to prospective employment. Also, it's essential to blend this framework into every employee's upgrade path and lifelong learning plans in this rapidly evolving field.

The panelists have been dealing with these problems for many years, as educators, trainers, and recruiters. Their desire is see dramatic improvement in education and training through development of clearly defined professional requirements. Such a framework will make it easier for institutions to design relevant and high-quality education that meets the needs of today's and tomorrow's globally distributed production companies.

Robin King
Imagina Corporation

Prashant Buyyala
Rhythm & Hues Studios

Shelley Page
DreamWorks Animation

Michael Sehgal
Autodesk, Inc

Comparison of Animation Storyboard Education in China and the United States

More and more Chinese universities and schools have started teaching animation storyboard courses, but there is still a shortage of original work produced by the Chinese animation industry. This paper discusses the development of Chinese animation storyboard education and compares it to similar programmes in the US. The result is new insight into how to most effectively teach animation storyboarding.

The inquiry focuses, in part, on development of story and visual content, and how storyboard artists develop concepts. Animation storyboard programmes are compared through an examination of their curricula, faculty, 2D and 3D computer animation works, lab facilities, environmental and aesthetic aspects, and contrasts between the two cultures. Practical approaches to teaching are also discussed. The goal of this presentation is to provide an international perspective on animation storyboard education and a summary of the current state of Chinese animation.

Hui Zhu
Xiaobo Lu
Tsinghua University

Frank Suarez
Bunko Studios, Inc.

METHODOLOGIES IN TEACHING



Saturday, 13 December
08:30–10:15
Educators Papers

SESSION CHAIR:
Chen Meifen

Deconstructing an Old Master Painting Using Photoshop's Advanced Toolset

An old master painting is a highly "made" thing, and every aspect of its appearance was subject to careful consideration and evaluation before its manufacture. These aspects can be very hard to grasp, but with Photoshop's advanced toolset, they can be visualised and made more accessible for the student of art history. This paper details interesting applications of the Adjustments menu, the Blend modes, and the Blend If values.

Martin Constable
Nanyang Technological University

Using Animation and Interactive Virtual Technology to Create Interpretive Materials for Museum Learning and Promotion

Museums around the world have incorporated computer graphics, virtual reality, 2D and 3D animation, and interactive technology in gallery exhibits, educational games, films, and online presentations for many years. To move beyond the traditional ways of using technology to create interpretive materials for teaching and learning, and to communicate with its audiences, The National Palace Museum (NPM) in Taiwan embarked on two major digital projects: a 3D Virtual Exhibition System: Experience the Imperial Artifacts and "Adventures in the NPM," a 13-minute 3D animation. This paper provides an overview of these projects.

In early 2003, NPM began to develop Experience the Imperial Artifacts. Through this system, users can virtually touch and interact with the famous Jadeite Cabbage, Ivory Ball, Carved Olive-Stone Boat, and Mao-Kung Ting from the museum collection. For the first time, users could experience the highest privileges of the emperor. The paper provides detailed

information on development, selection, creation, and implementation of various 3D technologies: the stereoscopic construction approach to visualising details, 2D photo stitching techniques for reconstructing a jadeite surface, a 3D laser-scanning method for geometric modelling, etc. It also reviews the tasks and challenges of the project and presents a documentary film about the development process of these high-tech systems.

In 2005, to bridge the gap between today's audiences and "ancient" artifacts, NPM collaborated with Digimax Corporation to produce a 3D animated film entitled "Adventures in the NPM." This film personifies some of the NPM's key collection objects and their adventures in the museum at night. Its lovely characters and captivating story are designed to bring viewers to a new level of appreciation for those ancient artifacts. The production team invited Gérard Pirès ("Knights in the Sky"), Tom Sito ("Osmosis Jones"), and Teddy Yang ("Shark Tale") to contribute their expertise to the production. The film premiered on 13 April 2007 to many positive reviews. Most recently, it was honored at the Tokyo International Animation Fair 2008 as the Animation of the Year. This paper shares some of the behind-the-scene stories of the production and its creative marketing and promotion.

James Quo-Ping Lin
National Palace Museum

Herminia Din
University of Alaska Anchorage

Chinese Whispers

Chinese Whispers refers to the concept of mediating between remote studios with new forms of hybrid designing and real-time online collaboration. A sequence of experiments explored the concepts of linkage and slippage that occur at the boundaries of converging technologies as a means of generating innovative and unexpected design outcomes (real and virtual, tangible and intangible). The project is framed in a contemporary context with background research into current concepts and theories centered on learning ecology and user-generated design into future trends and state-of-the-art technologies.

Chinese Whispers involved linking hardware and software that are not immediately compatible in a remote networked environment to facilitate an educational design process in both remote and real environments. Through this process, students

engaged in 3D scanning, downloading, visualising, analysing, remote simultaneous modelling in stereo, and deciding when to hit "3D print" at any given stage to invent a new design methodology.

Simon Fraser
Tim Miller
Morgan Barnard
Kris Henning
*Victoria University of Wellington
School of Design*

Mark Billingham
HIT Lab NZ

PEDAGOGY IN ACTION



Saturday, 13 December
10:30–12:15
[Educators Papers](#)

SESSION CHAIR:

Lucy Petrovic

Incorporating Animation Technologies Into Tools for Colonial American Education

This paper describes integration of animation and visual effects technologies into development of tools geared for colonial American education. Projects discussed include incorporation of crowd simulation software and full-body motion capture to recreate Revolutionary War battles, laser-scan acquisition of excavated archaeological artifacts, and recreation of historic structures with modelling and animation software. These technologies reduce the margin of error in representation, accentuate the level of realism for the end user, and create a more engaging educational presentation for schoolchildren.

Christopher Redmann
Drexel University

Wireless Sensor Network to Support a Multiple-Student Group Learning Game With One PC in the Classroom

Unlike the One Laptop Per Child concept promoted by the MIT Media Laboratory, this study utilizes a wireless sensor network to support a multiple-student group-learning game with one PC in classroom. In the traditional computerised classroom, each student is equipped with one desktop (or laptop) computer for learning. This approach (one kid one desktop) has some disadvantages. For example, the cost of establishing the classroom is high, and students are confined to their seats during

learning activities. It is adult-oriented, not kid-oriented.

This alternative approach, based on a wireless sensor network, allows students to interact with a computer via body motions, such as gestures, which is a much more natural way to use technology in the classroom. A set of ribbons with wireless gesture-detection sensors connects to a server. The ribbons are worn by the students, and the entire classroom's gestures are captured and sent to the server.

With this technology, the classroom can be reconfigured from one kid one desktop to many kids one desktop. In one application, students are asked to create, share, and review stories using the gesture-detection ribbons in the classroom.

Yi-Shiang Lin
Ben Chang
National Central University

PROFESSIONAL/ACADEMIC



Saturday, 13 December
15:45–17:30
[Educators Papers](#)

SESSION CHAIR:

Pan Zhigeng

Teaching 3D Animation: The Balance Between Creative and Technical Skills

We are getting much better at teaching the technical skills that our students need to enter the visual-effects and 3D-animation industries. But sometimes these skills take precedence in our teaching, and we inadvertently give less emphasis to the more elusive creative skills that affect promotion into positions such as producers, visual effects supervisors, art directors, etc.

Superior quality and an excellent story can make a big difference in the critical first eight seconds of a demo reel, when professionals decide whether to keep watching or hit the eject button. This paper covers not only the creative fundamentals, but also how to apply them consistently in our teaching, which in turn contributes to our students' success after they graduate.

Craig Caldwell
Griffith University

Computer Games Degrees in the UK: A Review of Current Practice

This paper examines the development, content, and outputs of computer games development (CGD) courses in the United Kingdom. It provides a background of CGD courses, followed by a case study of how a Bachelors of Arts course was developed and implemented at Swansea Metropolitan University. And it analyses and discusses the characteristics of student applications (such as background qualifications, achievement levels, and skill-sets), the nature of student projects (including their themes, creativity, and quality), course structure and composition, and staff profiles. The results offer a unique and valuable insight into development of CGD courses, especially in view of their increasing importance in fostering new creative talent for games and games-related industries.

Barry Ip
Martin Capey
Swansea Metropolitan University

From Motion Capture to Interactive Animation

Jean-Marc Gauthier, director of the new animation and digital arts MFA program at Tisch School of the Arts Asia in Singapore, summarises the program's curriculum: traditional animation, interactive animation, gaming, and motion studies applied to design.

His talk includes an overview of Life Motion Analysis: Ways to Visualise Motion From Real Life, a motion capture class designed for collaborative work among actors, dancers, storytellers, filmmakers, animators, and others.

Jean-Marc Gauthier
*Tisch School of the Arts Asia,
New York University*

SKETCHES

A dynamic forum for thought-provoking, speculative ideas, novel applications, what-if concepts, and behind-the-scenes production details. Following each sketch presentation, authors discuss future implications of their work and answer audience questions.

POSTERS

Graphic depictions of incremental or half-baked but innovative ideas displayed throughout the week with scheduled sessions for informal discussions.

CONFERENCE REGISTRATION CATEGORIES

Sketches:

- ★ Full Conference Access
- One-Day Full Conference

Posters/

Sketches Fast Forward:

- ★ Full Conference Access
- One-Day Full Conference
- Basic Conference/Exhibits Plus

Thursday, 11 December

SKETCHES

SKETCHES FAST FORWARD SESSION

★ ● ○

Wednesday, 10 December
18:00–20:00

GPU-BASED METHODS

★ ●

Thursday, 11 December
08:30–10:00

SESSION CHAIR:

Edward Angel

GPU Crowd Simulation

This first interactive, GPU-accelerated massive crowd simulation (>65,000 agents) combines parallel implementations of a course global-path planning technique with a fine-grained local avoidance model.

Jeremy Shopf

Christopher Oat

Joshua Barczak

Advanced Micro Devices, Inc.

GPU-Based Scene Management for Rendering Large Crowds

A system for rendering crowds of characters with full shadows, in arbitrary environments, with stable performance and excellent visual quality, managing all aspects directly on the GPU.

Joshua Barczak

Natalya Tatarchuk

Christopher Oat

Advanced Micro Devices, Inc.

GPU Tessellation for Detailed, Animated Crowds

A method for rendering detailed crowds of characters using tessellation, instancing, and LOD management, along with a technique to reduce artifacts along uv seams when using displacement mapping.

Natalya Tatarchuk

Joshua Barczak

Budirijanto Purnomo

Advanced Micro Devices, Inc.

A GPU-Based Approach for Real-Time Haptic Rendering of 3D Fluids

An innovative GPU-based approach that enables real-time haptic rendering of high-resolution 3D Navier-Stokes fluids.

Meng Yang

University of Pennsylvania

Jingwan Lu

Hong Kong University of Science and Technology

Zehua Zhou

Alla Safonova

Katherine Kuchenbecker

University of Pennsylvania

RECENT PRODUCTION TECHNIQUES AT LUCASFILM ANIMATION SINGAPORE

★ ●

Thursday, 11 December
13:45–15:15

SESSION CHAIR:

Ken Anjyo

“Star Wars: The Clone Wars” TV Series: Making the Impossible Happen

In creating episodes of “Star Wars: The Clone Wars,” flexibility is the key. It requires an adaptable pipeline and lighting tools that enable completion of several tasks in one render calculation.

Ryan T. Smith

Lucasfilm Animation Singapore

The Invisible Art Behind “Ironman”

What is real and what is not? In “Ironman,” suspension of disbelief due to the larger-than-life action and realistic backgrounds was the ultimate goal for matte painters.

Danny Janevski

Lucasfilm Animation Singapore

Keeping It Real: Classical Art Principles in Today’s VFX Features

The tools have changed, but it is still the artist’s process, rooted in the knowledge of basic artistic principles, that make visual effects convincing and realistic.

Kalene Dunsmoor

Lucasfilm Animation Singapore

Lighting Clone Wars: A New Planet Every Week

How to bring the vast Star Wars universe to TV without making it look small? The challenge of introducing new characters and locations in every episode, on a TV production schedule.

Ben Huber

Lucasfilm Animation Singapore

Clone Wars Animation in Lucasfilm Animation Singapore

What does it take to animate “Star Wars: The Clone Wars?” From stills and shots, learn how animators bring the Star Wars universe and its colorful characters to life.

Ullas Narayana
Lucasfilm Animation Singapore

INTERACTIVE TECHNIQUES

★ ●
Thursday, 11 December
15:45–17:15

SESSION CHAIR:
Matt Adcock

Balance Ball Interface

Only the user sits on the balance ball, and this system captures the user’s rough motion and behaviour.

Masasuke Yasumoto
Tokyo University of the Arts

Fu-Fuu: An Interactive Game Using Breath Control

A novel game interface that uses a player’s position and breath captured via a camera and a microphone to manipulate a virtual paper airplane.

Taichi Nishiyori
Soei Sato
Toki Takeda
Narumi Tashiro
Ryoichi Ando
Maki Terai
Taketoshi Ushiyama
Reiji Tsuruno
Kyushu University

Tracking the Position of a Mobile Device on Interactive Screens With RFID

A novel method for identifying and tracking the position of mobile devices on interactive screens and a prototype system of the proposed method.

Sang-Jun Han
Kuk-Hyun Han
Pil Seung Yang
Bo Hyun Kyung
Samsung Electronics

Bear’s Beer and Smart Platter -

Handheld Interactive Haptic Display
A new tray-shaped force-feedback display with an interactive robot and a vision-based positioning system. This method enables haptic interaction in handheld devices.

Tomohiro Amemiya
NTT Communication Science Laboratories

Hideyuki Ando
Taro Maeda
Osaka University

ARTS & ROBOTS

★ ●
Friday, 12 December
08:30–10:00

SESSION CHAIR:
Daniel Maskit

Shadow Play

A method for computer-aided shadow play, where shadows cast on a screen are saved and projected back onto the screen. Users can create an environment with butterflies that are controlled by user shadows.

Cem Sina Cetin
Sabanci Üniversitesi

Automatic Composition for Contemporary Dance Sequences

An automatic composing system for contemporary dance using 3D motion data. Instead of creating completed connections, this method creates conceptual sequences for dance lessons.

Asako Soga
Ryukoku University

Bin Umino
Toyo University

Motoko Hirayama
University of Tsukuba

Nervxxx: Introducing Biosignals to Live Video Performance

A video performance system based on EEG (the most informative of the biosignals) and EMG (highly controllable) data.

Satoru Tokuhisa
Keio Research Institute at SFC

Rendering Lots of Robots

An outline of the lighting pipeline tools and tricks used at Double Negative to render the Golden Army for “Hellboy 2: The Golden Army”.

Katherine Roberts
Graham Jack
Double Negative

PHOTOGRAPHS & DRAWINGS

★ ●
Friday, 12 December
10:30–12:00

SESSION CHAIR:
Diego Gutierrez

Forward Lean–Deriving Motion Illustrations From Video

Forward Lean extracts moving objects from a video sequence and then illustrates the objects’ motions in a single static image by shearing the image into the direction of its motion.

Marc Nienhaus
mental images GmbH

Holger Winnemöller
Adobe Research Inc.

Bruce Gooch
University of Victoria

Automatic 3D Caricature Generation By Learning in Enlarged Manifold Space

Lack of samples makes it challenging to generate 3D caricatures by machine learning. In this method, a training set is enlarged by reconstructing 3D caricatures, and then a regressive model is learnt by manifold regularization.

Junfa Liu
Chinese Academy of Sciences

Visualising Adaptive Clusters of Digital Photographs

With this visualisation method, which considers semantic flow in each cluster, users can select references from a specific camera for smart visualisation if concurrent photos are used as input data.

Chuljin Jang
Hwan-Gue Cho
Pusan National University

Clean up Your Image Using Internet Photo Collections

An algorithm that uses images from internet photo collections to remove user-identified occlusions in an image and faithfully reconstruct the image data that should have been displayed.

Hanieh Taipalus
Helsinki University of Technology

Satoshi Kondo
Matsushita Electric Industrial Co., Ltd.

Takafumi Aoki
Tohoku University

CURVES, PLANES, AND TERRAINS

★ ●

Friday, 12 December
13:45–15:15

SESSION CHAIR:

Olga Sorkine

Single-View Sketch-Based Modelling From Construction Lines

A new modelling-from-sketches system in which models are made of simple parts drawn with only two strokes, and all the strokes are drawn from a single viewpoint.

Alexis Andre
Suguru Saito
Masayuki Nakajima
Tokyo Institute of Technology

Interactive Control of 3D Class-A Bézier Curves

For design of highly aesthetic curves, this interactive technique controls 3D, class-A Bézier curves by specifying the two end-points and their tangents.

Ryo Fukuda
Norimasa Yoshida
Nihon University

Takafumi Saito
Tokyo University of Agriculture and Technology

Hexagonal Geometry Clipmaps for Spherical Terrain Rendering

A unified representation of hierarchical triangular mesh and geometry clipmaps using hexagonal geometry clipmaps to render spherical terrain with uniform sampling on the sphere and fast rendering.

Shiben Bhattacharjee
P. J. Narayanan
International Institute of Information Technology, Hyderabad

Relief Clipping Planes for Real-Time Rendering

A technique for performing clipping and capping of arbitrarily shaped solids against clip planes with an additional height or offset map.

Matthias Trapp
Universität Potsdam

Jürgen Döllner
Universität Potsdam

VOLUMES

★ ●

Friday, 12 December
15:45–17:15

SESSION CHAIR:

Baoquan Chen

Optimised Volume Sampling Based on Manipulation Points for Volume Deformation

A volume-sampling mesh that is optimised to users' dynamic manipulation and the volume data used for interactive volume deformation.

Kei Wai Cecilia Hung
Megumi Nakao
Kotaro Minato
Nara Institute of Science and Technology

Curvature-Based Volume Visualisation of Local Structures

A new curvature-based transfer function for interactive volume visualisation and mining of local structures. The visualisation results are obtained in real time by GPU computing.

Yu Hirata
Megumi Nakao
Tadao Sugiura
Kotaro Minato
Nara Institute of Science and Technology

Rigid-Body Interaction in SPH

A new boundary force based on collision to solve rigid-body interactions in SPH. This method produces more physically feasible results in rigid-rigid interaction than the existing method.

Seungtaik Oh
Younghee Kim

Byung-Seok Roh
Electronics and Telecommunications Research Institute

VISUAL SIMULATION

★ ●

Saturday, 13 December
08:30–10:00

SESSION CHAIR

Geoff Wyvil

Visual Simulation of Scattering and Settling of Fine Particles

This approach to simulating scattered fine particles can simulate the phenomenon in which particles are scattered by the wind and subsequently settle.

Tetsuyuki Minamihara
Maki Terai
Reiji Tsuruno
Kyushu University

A Visual Simulation for Gold Leaf and Japanese Lacquerware

A method for faithfully representing gold leaf and Japanese lacquer using spectral BRDF and a method for laying out craft materials.

Kazunori Miyata
Kaisei Sakurai
Japan Advanced Institute of Science and Technology

Toshihiro Tomoi
Hiroshi Tashimo
Koji Imao
Yoshiyuki Sakaguchi
Digital Fashion Limited

Fire Simulation and Rendering for "Hellboy 2: The Golden Army"

How Double Negative developed a new fluid simulation system for the pyrokinetic character Liz, resulting in fast, highly detailed fire simulations and renders.

Eugenie von Tunzelmann
May Leung
Double Negative Visual Effects

Interactive Simulation of the Process of Glottal-Wave Generation Using a GPU

A FDLB (compressible and thermal fluid)-MPS (new anisotropic elastics model) coupling method using GPU to directly simulate the process of of glottal-wave generation during human phonation.

Kazuhiko Yamamoto
Kyushu University

LIGHTING & REFLECTANCE

★ ●

Saturday, 13 December
10:30–12:00

SESSION CHAIR:

Wojciech Jarosz

B-Spline Volume vs. Other BRDF Models

This sketch shows that the B-spline volume representation is more suitable for fitting to measured BRDF data than two popular analytical models such as Cook-Torrance and Lafortune.

Joo-Haeng Lee

Electronics and Telecommunications Research Institute

SPARTA: A Scalable Architecture for Ray-Tracing Applications

A low-cost, scalable hardware and software infrastructure for high-performance, interactive ray tracing of very large models that will target large-scale visualisation applications.

Ross Brennan

Michael Manzke
Trinity College Dublin

Spatial-Directional Radiance Caching

Spatial-directional radiance caching accelerates indirect illumination computation on arbitrary glossy surfaces. The main idea is to perform lazy indirect illumination evaluation in both the spatial and directional domains.

Václav Gassenbauer

Czech Technical University in Prague

Jaroslav Křivánek

Cornell University

Fast, Approximate HDR Image-Based Lighting Using Summed-Area Tables

A method to rapidly generate higher-order summed-area tables that allows multiple tables to be generated dynamically while maintaining interactive frame rates.

Justin Hensley

Advanced Micro Devices, Inc.

Thorsten Scheuermann

Valve Software

CALIBRATION & ACQUISITION

★ ●

Saturday, 13 December
13:45–15:15

SESSION CHAIR:

Craig Donner

Image-Correction Method for Multi-Projector Display Using SIFT Features

An image-correction method for multi-projector display that corrects geometric transformation of projected images using feature points in images instead of the special patterns.

Toru Takahashi

Norihito Numa
Tatsuya Kawano
Takafumi Aoki
Tohoku University

Satoshi Kondo

Matsushita Electric Industrial Co., Ltd.

Gloss and Normal Map Acquisition Using Gray Codes

This technique for gloss and normal map acquisition of fine-scale specular surface details provides an efficient and easy method employing only ubiquitous hardware components.

Yannick Francken

Tom Cuypers
Tom Mertens
Philippe Bekaert
Universiteit Hasselt

Considering Shape Reconstruction from Specular Reflection

This method considers the availability of 3D measurement of specular objects when simulating with CAD rendering software.

Tomohito Masuda

Toppan Printing Co., Ltd.

Abhijeet Ghosh

Wan-Chun Ma
University of Southern California

Hiroki Unten

Toppan Printing Co., Ltd.

Paul Debevec

University of Southern California

Image-Based Roughness Modelling Using Perlin Noise

A method for modelling the roughness of real objects from captured images using Perlin noise. Model parameters were acquired from a real object.

Masashi Baba

Masayuki Mukunokiy
Naoki Asada
Hiroshima City University

POSTERS

★ ● ○

Thursday, 11 December–
Saturday, 13 December
09:30–18:30

Automatic Data-Extracting Software for Retrieval of Lifetime Photos Using Scent Information

Young ah Seong

The University of Tokyo

Yasuaki Takehi

Keio University

Jean-Jacques Delaunay

Takeshi Naemura
The University of Tokyo

Enhancing Procedural Animations With Motion Capture Data

Chang-Hung Liang

Tsai-Yen Li
National Chengchi University

Fast Plausible 3D Face Generation From a Single Photograph

Akinobu Maejima

Shigeo Morishima
Waseda University

Flaneur: Digital See-Through Telescope

Hiroshi Sakasai

Hiroshi Kato
Takako Igarashi
Miho Ishii
Masahiko Inami
Naohito Okude
Masa Inakage
Keio University

Green Graphics: Feedback Control
for Energy-Efficient Rendering

Gabriyel Wong
Jianliang Wang
Nanyang Technological University

High-Speed Hand Tracking for
Gesture Recognition

Takafumi Aoki
Tokyo Institute of Technology

Interactive Animation of Waterdrops With
Particle-Based Fluid Simulation

Takuya Abe
Masataka Imura
Sei Ikeda
Yoshitsugu Manabe
Kunihiro Chihara
Nara Institute of Science and Technology

Kime Pose Anime in Japanese Style
Using Action-Line Control

Satoshi Cho
Kanagawa Institute of Technology

Toshihiro Komma
Shobi University

Hisashi Sato
Kanagawa Institute of Technology

Kunio Kondo
Tokyo University of Technology

Real-Time Composition
Pre-Visualisation System

Hye-mi Kim
Jungjae Yu
Jae-Hean Kim
*Electronics and Telecommunications
Research Institute*

Shade Pixel: Interactive Skin for
Ambient Information Displays

Hyunjung Kim
Boram Lee
JinHa Seong
Woohun Lee
*Korea Advanced Institute of Science
and Technology*

Toward Multi-View Photometric Stereo
for Body-Shape Measurement

Yusuke Yoshiyasu
Keio University

Twist-and-Stretch: A Shape Dissimilarity
Measure Based on 3D Chain Codes

Victor Lopez
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Irene Cheng
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Anup Basu
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Presented in cooperation with SIGGRAPH Asia, these small symposia are related to important aspects of computer graphics and interactive techniques.

www.machinima.com.sg

Machinima Symposium 2008

Friday, 12 December 2008

Saturday, 13 December 2008

Suntec Singapore International Convention and Exhibition Centre

Ascertain the future visage of Machinima, its making, distribution and consumption. Acquire knowledge from industry players expounding on the new trade. Gather tips and techniques from international experts on the scene, explore new terrains and delve deep into the arts and sciences of Machinima making and expression.

www.machinima.com.sg

www.vrcai2008.org

7th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and its Applications in Industry (VRCAI 2008)

Monday, 8 December 2008

Tuesday, 9 December 2008

Biopolis

An exciting VRCAI 2008 awaits participants from both academia and industry in Singapore, a hotbed of innovation where state-of-the-art technologies and applications in the virtual reality continuum (VRC) will be explored and presented. Spanning next-generation info-communication environments such as virtual reality, augmented virtuality, augmented reality, and mixed reality. VRC is key to defining and interacting, with and within, our virtual worlds. Advances in research and novel applications in this field have revolutionised much of our leisure activities, making them more appealing and fun. Just as significantly, these advances provide the foundation for more effective interactivity in work- and learning-related activities.

www.vrcai2008.org

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Suntec Singapore International Convention & Exhibition Centre

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- Registered attendees under the age of 16 must be accompanied by an adult at all times
- Children under 16 are not permitted in the Exhibition. Age verification is required

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The Suntec Singapore International Convention & Exhibition Centre is handicap-accessible. If you have special needs or requirements, please contact Conference Management.

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There are several ATMs located throughout the lobbies of the Suntec Singapore International Convention & Exhibition Centre.

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A variety of coffee shops, snack bars, and restaurants are available in the convention centre and the adjacent Suntec City Mall. For Stand Catering Services, exhibitors are required to contact Suntec Singapore at +65.6825.2077 (Danielle Lim). Outside food and drinks are strictly not allowed within the convention centre.

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The rates are as follows:

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07:00–17:00

\$1.07 per half hour or part thereof

17:00–midnight

\$2.14 flat per entry

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Midnight–07:00 the next day

\$1.07 per hour or part thereof

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BreakPoint Books offers the latest and greatest books, CDs, and DVDs on computer animation, graphic design, gaming, 3D graphics, modelling, and digital artistry. The bookstore features recent books by SIGGRAPH speakers and award winners. To suggest books, CDs, or DVDs that should be available in the bookstore, contact:

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Child care is not provided at SIGGRAPH Asia 2008. Contact your hotel concierge for suggestions.

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- Lost badges will not be replaced. If you lose your badge, you must register again at the published rates to obtain a new badge.
- Technical materials included with your registration must be picked up at the SIGGRAPH Asia 2008 Merchandise Pickup Centre. Lost merchandise vouchers will not be replaced.
- To be admitted to the Reception, you must have a ticket. (Your badge does not provide access)
- Attendees under the age of 16 must be accompanied by an adult at all times. Age verification is required.
- No cameras or recording devices are permitted at SIGGRAPH Asia 2008. Abuse of this policy will result in the loss of the individual's registration credentials.
- SIGGRAPH Asia 2008 reserves the right to deny registration or entrance to any attendee or prospective attendee, and to cancel an existing registration, if it determines that a registration or an attendee is not in the best interest of SIGGRAPH Asia 2008 or ACM SIGGRAPH.

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Level 4, Halls 401 & 402

Thursday, 11 December 09:30–18:30

Friday, 12 December 09:30–18:30

Saturday, 13 December 09:30–18:30

CONFERENCE HOURS

10 December to 13 December: 08:00–18:00

Registration is open from 08:00 to 18:00 daily.

TRAVEL & HOUSING

Travel

If you are traveling from the US to SIGGRAPH Asia 2008, please contact Pleasant Holidays at 800.877.8111 or airfare@siggraph.org to obtain special travel rates. Please inform Pleasant Holidays that you are attending the SIGGRAPH Asia 2008 conference to enjoy these rates.

Housing

Please make your hotel reservations by 7 November 2008. Reservations made after 7 November 2008 will be based on availability and SIGGRAPH Asia 2008's discounted rates may not apply.

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Important notice: The SIGGRAPH Asia 2008 Shuttle Service is available only to attendees who register at official conference hotels through the SIGGRAPH Asia 2008 hotel reservation system. All attendees must have a SIGGRAPH Asia 2008 badge to board the Shuttle Service.

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Airport transfers can be arranged through SIGGRAPH Asia 2008's Official Travel Agent. The airport transfer is S\$ 70.00 nett per way per car (Mercedes). If passenger pick up is between 23:00 and 07:00 hours, an additional fee of S\$ 15.00 nett will be applicable.

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