**Tutorial: Seeing in 3D**

**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 visualise 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.

**Instructor Bio**

Geoff Wyvill, University of Otago

Well known in SIGGRAPH circles, Geoff Wyvill has contributed technical presentations, artworks, and animation to many conferences. He is director of computer graphics research at the University of Otago and a director of Animation Research Limited, which makes commercial animation and animation software for sports. He has a BA in physics from Oxford University and an MSc and PhD in computer science from Bradford University. Over many years, he has encouraged scientists to develop artistic pursuits and artists to learn science. He has published over 100 technical articles and papers, and given numerous invited talks and courses.

** Runs from 9:15 to 16:30, Lunch at 12:15**

**CGI Welcome Reception at 19:00**

Harbour Room, hors d’oeuvres will be served.
**CGI Organization**

*Conference Chairs*
Brian Wyvill, University of Victoria
Nadia Magnenat-Thalmann (MIRALab, Switzerland)

*Program Chair*
Geoff Wyvill, University of Otago

*Webmaster*
Erwin de Groot

**CAe Organization**

*Conference Chair*
Neil Dodgson University of Cambridge, UK

*Local Organization Chair*
Brian Wyvill, University of Victoria, Canada

*Program Chairs, Technical Program*
Peter Hall, University of Bath, UK
Oliver Deussen, University of Konstanz, Germany

*Program Chairs, Arts Program*
Steve Gibson, University of Victoria, Canada
Gerry Hushlak, University of Calgary, Canada
Jeffrey Shaw, University of New South Wales, Australia

*Publicity Chair*
Tobias Isenberg, University of Groningen, The Netherlands

*Administration (CAe and CGI)*
Shawna Wyvill, Victoria, Canada

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**Computer Graphics Int’l 2009**

**WEDNESDAY**

**8:45 — 9:15** CGI Opening

**9:15 — 10:40** CGI Keynote Speaker
Gavin Miller, Adobe

**10:45 — 12:15** Papers

Incorporating object-centered sampling and Delaunay tetrahedrization for visual hull reconstruction  
Xin Liu, Marina L. Gavrilova, Jon Rokne

Creating MPU Implicit Surfaces from Unoriented Point Sets with Orientation Inference  
Yi-Ling Chen, Shang-Hong Lai

Variational tetrahedral mesh generation from discrete volume data  
J. Dardenne, S. Valette, N. Siauve, N. Burais, R. Prost

Streaming Surface Sampling using Gaussian Epsilon-nets  
Pablo Diaz-Gutierrez, Jonas Bösch, Renato Pajarola, M. Gopi

Maximal Independent Set Graph Partitions for Representations of Body-Centered Cubic Lattices  
Kenny Erleben

**12:30 — 13:50** Lunch

**14:00 — 15:30** Papers

Dynamic Collage - A New Method for Browsing Massive Photo Collections  
Yinzhen Yang, Yichen Wei, Chunxiao Liu, Qunsheng Peng, Yasuyuki Matsushita

Automatic View Selection through Depth-Based View Stability Analysis  
Pere-Pau Vázquez

An information theoretic approach to camera control for crowded scenes  
Cagatay Turkm, Emre Koc, Selim Buluwy

Pick-by-Vision: Augmented Reality supported Order Picking  
Rupert Reif, Willibald A. Günthner

Realistic Real-Time Sound Re-Synthesis and Processing for Interactive Virtual Worlds  
Fernando Trebesien, Manuel M. Oliveira

**16:00 — 17:30** Papers

Fragment Based Responsive Character Motion for Interactive Games  
Xi Cheng, Bengfai Liu, Zhigeng Pan, Bing Tang

Real-time falling animation with active and protective responses  
Zhiyong Pan1, Xi Cheng, Wenzi Chen, Bengfai Liu1, Bing Tang

Efficient motion data indexing and retrieval with local similarity measure of motion strings  
Shuangyuan Wu, Shihong Xia, Zhaoli Wang, Chunpeng Li

Motion Constraint  
Daniel Raunhardt, Ronan Boulic

**18:30–20:00** CAe / CGI Opening Reception
Ballroom Foyer, hors d’oeuvres will be served.

**20:00-21:30** Art Show
Ascot room
**9:15 — 10:40 Shared Keynote Speaker**
Carlo H. Séquin, UC Berkeley

**10:45 — 12:15 Papers**
- Fluid-based Hatching for Tone Mapping in Line Illustrations
  Afonso Paima, Emilia Vital Brazil, Fabiano Petronetto, Mario Costa Sousa
- An extended GPU radiosity solver including diffuse and specular reflectance and transmission
  Günter Wallner
- High-Quality Brightness Enhancement Functions for Real-Time Reverse Tone Mapping
  Rafael Pacheco Kovaleski, Manuel M. Oliveira
- Towards Multi-perspective Rasterization
  Xuan Yu, Jingyi Yu, Leonard McMillan
- Fast Real-time Caustics from Height Fields
  Cem Yuvsel, John Keyser

**12:30 — 13:50 Lunch with Speaker**
Werner Purgathofer, Vienna University of Technology

**14:00 — 15:30 Papers**
- Compact Real-Time Modeling of Seated Humans by Video Sprite Sequence Quantization
  Chun Jia, Voicu Popescu
- Feature-Rich Distance-Based Terrain Synthesis
  Brennan Rusnell, David Mould, Mark Eramian
- Feature Enhancement by Volumetric Unsharp Masking
  Yubo Tao, Hai Lin, Hujun Bao, Feng Dong, Gordon Clapworthy
- Adaptive Smooth Surface Fitting with Manifolds
  Cindy Grimm, Tao Ju, Ly Pham, John Hughes
- Dual-RBF based Surface Reconstruction
  Yuxu Lin, Chun Chen, Mingli Song, Zichen Liu

**16:00 — 17:30 Papers**
- Mr-SDM: a Novel Statistical Deformable Model for Object Deformation
  Qihen He, Horace H. S. Ip, Jun Feng And Xianbin Cao
- Generating Anatomical Substructures for Physically-Based Facial Animation Part 1: A Methodology for Skull Fitting
  Olusola Aina
- Interactive skeletonization of intensity volumes
  Sashakti S. Abeyinghe, Tao Ju
- Light Source Estimation of Outdoor Scenes for Mixed Reality
  Yanli Liu, Xueying Qin, Songhui Xu, Eihachiro Nakamue, Quansheng Peng

**19:30—21:30 Banquet at University of Victoria**
Transfer at 18:00 to UVic Faculty Club
Speaker: Andrew Glassner
Dinner Entertainment: The Jan Stirling Jazz Trio

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**Art Show: Computer Installations**
Opening: Wednesday 18.30-20.00 — Chelsea/Derby room
Running: Thursday and Friday daytime
1. Henrique Roscoe hal
2. Benjamin Forster Drawing Machine
3. Elif Ayiter Anatomia
4. Jerry Hushlak, Jeffrey Boyd, Christian Jacob, Scott Novakowski Intelligent Fans

**Art Show: Print**
Opening: Wednesday, 18:30–20:00, Foyer
Running: Thursday and Friday, daytimes
1. Murat Germen Chronophotography
2. The Luxury of Protest c/o Peter Crnokrak A B peace & terror etc.
3. Penousal Machado and Juan Romero Losing System Signature

**Artist Presentations**
Wednesday 20:00–22:00, Ascot Room
Each artist gets 20 minutes.
1. Mehrdad Garousi The Dancing Flowers
2. Florian Gruber, Nikolaus Hartmann, Thomas Lorenz and Christina Simmel Stroem — an audiovisual installation
3. Fernando Graca Penousal Machado Informal Stains: gestural painting
4. Jinsook Kim Motion Gestalt Grouping Principles for the Creative Process of Motion Graphics
5. Andres Wanner The Art Machine

**Screenings**
Fri. 17.00-18.00 – Ascot Room
The Creative Process of Motion Graphics
1. Anabela Costa VORTEX ROOM
2. Julie Andreyev Animal Lover
3. Seung-Chan Yang EXPECTED OR UNEXPECTED
4. Jim Bizzocchi Winterscape

**Performance**
Friday, 20:00-0:00, Ascot Room
Steve Gibson, Stefan Müller Arisona, Justin Love, Randy Adams, and Jim Olson Exploding, Plastic & Inevitable Redux
8:45 — 10:15 Automated Synthesis
Automated Landscape Painting in the Style of Bob Ross Craig Kaplan, S. Alex Kaladjian, and Stephen Mann
Aesthetic Placement of Points Using Generalized Lloyd Relaxation Oliver Deussen

10:45 — 11:45 Aesthetics
Distinctive Parameters of Expressive Motion Lyn Bartram and Ai Nakatani
Aesthetic Appraisal of Art - From Eye Movements to Computers Christian Wallraven

11:45 — 12:45 CAe Keynote Speaker
Sheelagh Carpendale, University of Calgary

12:45 — 13:00 CAe Closing

13:00 — 14:00 Lunch
9:15 — 10:40 Shared Keynote Speaker
Andrew Fitzgibbon, Microsoft Research Cambridge

10:45 — 12:15 Papers

**Inherent limitations on specular highlight analysis**
Lorcán Mac Manus, Masa-hiro Iwasaki, Satoshi Sato, Neil A. Dodgson

**Automatic Registration of Multiple Range Images Based on Cycle Space**
Fei Hou, Yue Qi, Xukun Shen, Shen Yang, Qinping Zhao

**Salient Spectral Geometric Features for Shape Matching and Retrieval**
Jiaxi Hu, Jing Hu

**An Efficient Two Steps Algorithm for Wide Baseline Image Matching**
Cosmin Ancuti, Codruta Orniana Ancuti, Philippe Bekaert

12:30 — 13:20 Lunch

13:30 — 15:00 Papers

**Physically Based Simulation of Thin-shell Objects Burning**
Shigang Liu, Qiwen Liu, Tai-An, Zhishu Sun, Qunsheng Peng

**Real-Time Multi-Band Synthesis of Ocean Water with New Iterative Up-Sampling Technique**
E. M. S. Hadi, M. H. S. Moghadam, Parameswaran F. Samavati, M. Emadi

**Simulation of Swirling Bubbly Water Using Bubble Particles**
Ho-Young Lee, Jeong-Mo Hong, Chang-Hun Kim

**Interchangeable SPH and Level set Method In Multiphase Fluid**
Ho-Young Lee, Jeong-Mo Hong, Chang-Hun Kim

**A Fast Method for Simulating Destruction and the Generated Dust and Debris**
Takashi Imagire, Henry Johan, Tomoyuki Nishita

15:30 — 16:30 Shared Keynote Speaker
Andrew Pearce

16:30-16:45 CGI Closing

17:00 — 18:00 Art event: Screenings

20:00 — 24:00 Art event: Performance

*CGI delegates are invited to attend the Computational Aesthetics art events this evening*