PROGRAM

http://vis.computer.org/vis2004

October 10-15, 2004

IEEE VISUALIZATION

VIS 2004

austin, texas

Sponsored by IEEE Computer Society Visualization and Graphics Technical Committee
In cooperation with ACM / SIGGRAPH

IEEE

IEEE COMPUTER SOCIETY

WELCOME

Welcome to IEEE Visualization 2004, the 15th international conference on visualization innovations and their applications! You have an exciting selection of technical forums at the IEEE Visualization conference and the symposia for Information Visualization and Volume Visualization.

This year we reflect upon our rich 15 year history and look forward to issues of relevance in the future. The visualization field is becoming a recognized technology impacting all avenues of life. Our invited speakers offer perspectives to guide your research, applications, and commercial opportunities.

This year the technical community offers workshops and tutorials for dedicated learning. The papers offer an integrated selection of outstanding research contributions and creative application papers. The panels discuss some of the most pressing current topics. The posters allow for very current results to be presented in informal interactive sessions. For the first time this year, a Visualization Contest will be held. These combined with our exhibitors, Interactive Demonstrations Laboratory, and Bird of a Feather sessions provide you the best of Visualization 2004 in the live music capital of the world.

Do not forget to use the receptions and breaks as time for talking to your peers and colleagues. From the government program managers to the venture community, we come to meet each other and learn.

Thank you for coming, and enjoy the conference!

Kelly Gaither, *Texas Advanced Computing Center, The University of Texas at Austin*

Jim Thomas, *Pacific Northwest National Laboratory*

IEEE Visualization 2004 Conference Chairs

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ABOUT AUSTIN

Austin is in the heart of Texas and is the eastern marker for the Texas Hill Country. Austin is considered "The Live Music Capital of the World," boasting more than 120 places to hear live bands. In spirit, the city of Austin is part wild-west, hippie, and high-tech all mixed together. The city is the home of both the state capital and the main campus of the University of Texas, and has 300 days of sunshine a year. From April through October, Austin is home to the largest urban bat colony in the United States, which resides underneath the Congress Avenue bridge over Town Lake.

For the latest news on all that's happening in Austin, visit http://www.austintexas.org.

For a list of recommended lunch locations, see the concierge located in the hotel lobby.

MAP OF THE HYATT REGENCY AUSTIN

1 Texas Foyer

CONFERENCE REGISTRATION

Sunday- Thursday: 7:30 a.m. - 5:00 p.m.

Friday: 7:30 a.m. - 12:30 p.m.

BIRDS-OF-A-FEATHER (BOF) BOARD

Several Vis 2004 Exhibitors are hosting Birds-of-a-Feather sessions to discuss their visualization offerings in depth. Check the "BOF Board" for times and room locations. All conference attendees are welcome.

2 Texas Ballrooms V, VI, VII

EXHIBITION AND INTERACTIVE DEMONSTRATION LAB

Tuesday: 10:00 a.m. - 6:00 p.m.

Wednesday: 10:00 a.m. - 9:00 p.m.

Thursday: 10:00 a.m. - 2:00 p.m.

3 Texas Ballroom IV

INTERNET ACCESS

Sunday: 3:00 p.m. - 7:00 p.m.

Monday - Thursday: 7:30 a.m. - 7:00 p.m.

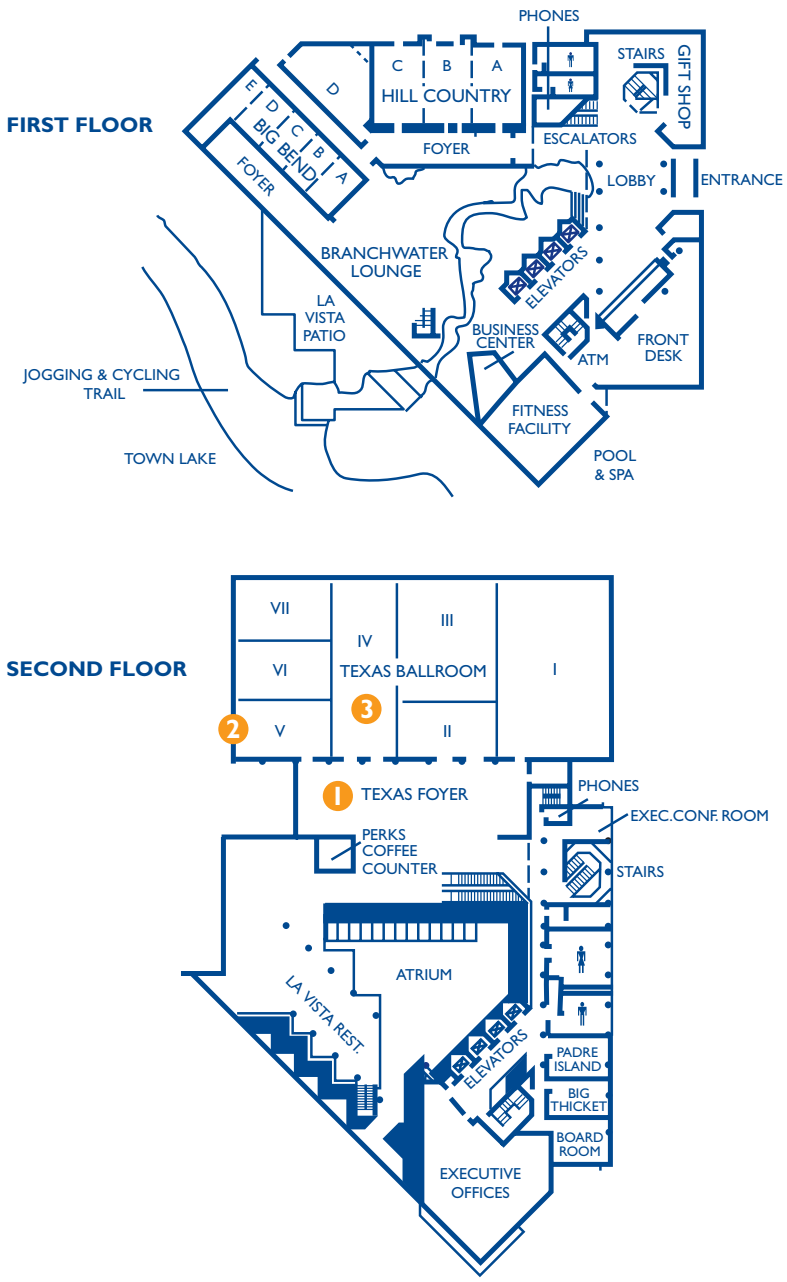
Friday: 7:30 a.m. - 12:30 p.m.

INFOVIS POSTERS

Sunday - Tuesday

VISUALIZATION POSTERS

Wednesday - Friday



VIS 2004 TUTORIALS AND WORKSHOPS

INFOVIS AND VOLVIS SYMPOSIA

SUNDAY

Texas Blrm II, III
Tutorial 1: Information Visualization and Discovery

Beginner/ Intermediate

8:30 a.m. - 5:30 p.m.

Hill Country C-D
Tutorial 2: Procedural Encoding of Scattered Data, Theory and Applications

Intermediate/ Advanced

8:30 a.m. - 5:30 p.m.

Hill Country A-B
Workshop on Parallel Visualization Architectures and Chromium

8:30 a.m. - 5:30 p.m.

INFOVIS — Texas Blrm I
Papers Preview

Evaluation

Coffee Break

InfoVis Contest

Texas Blrm I
InfoVis Fun

MONDAY

Hill Country A-B
Tutorial 3: GPGPU: General-Purpose Computation on Graphics Processors

Intermediate

8:30 a.m. - 5:30 p.m.

Hill Country C-D
Tutorial 4: Advanced Virtual Medicine: Techniques and Applications for Medicine-Oriented Visualization

Intermediate

8:30 a.m. - 5:30 p.m.

INFOVIS — Texas Blrm I
Keynote Address: Stuart Card, *PARC*

Coffee Break

Techniques and Tools

Lunch Break

Multivariate Data

Coffee Break

Design Studies

Poster Preview

VOLVIS — Texas Blrm II, III
Keynote Address: Hanspeter Pfister, *MERL*

Coffee Break

Hardware Accelerated Techniques

Transfer Functions

Surfaces & Segmentation

Texas Ballroom I, II, III
Symposia/Tutorials Reception and InfoVis Poster Session

TUESDAY

Hill Country C-D
Tutorial 5: An Introduction to Visualization Using VTK

Beginner

8:30 a.m. - 5:30 p.m.

Hill Country A-B
Tutorial 6: Interactive Texture-Based Flow Visualization

Intermediate

8:30 a.m. - 12:30 p.m.

Hill Country A-B
Tutorial 7: Feature Oriented Methods in Flow Visualization

Intermediate

1:45 p.m. - 5:30 p.m.

INFOVIS — Texas Blrm I
Evaluation and Perception

Coffee Break

Models and Systems

Lunch Break

Texas Blrm I
InfoVis Open Meeting

Graphs

Coffee Break

Capstone Address: Steve Roth, *MAYA Viz and Carnegie Mellon University*

VOLVIS — Texas Blrm II, III
Rendering

Volume Graphics & Volume Applications

Capstone Panel: 1996 Retrospective Panel-What is the Future of Volume Visualization & Rendering?

Texas Blrm V,VI,VII
Exhibition and Interactive Demos

VIS 2004 CONFERENCE AT-A-GLANCE

WEDNESDAY

Texas Ballroom I, II, III

Opening Remarks and Keynote Session:

The Human Visual System: How is its Design Related to the Physics of the Natural Environment?

Dr. Wilson S. Geisler, *The University of Texas at Austin*

Coffee Break

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 1A: Volume Rendering I	**Panel 1:** Can We Determine the Top Unresolved Problems of Visualization?	**Session 1C:** Flow Visualization I

Lunch Break

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 2A: Volume Rendering II	**Panel 2:** In the Eye of the Beholder: The Role of Perception in Scientific Visualization	**Session 2C:** Flow Visualization II

Coffee Break

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 3A: View/ Importance Driven Rendering	**Session 3B:** Systems	**Session 3C:** Flow Visualization III

Hill Country A-C

Poster Preview

Visualization Contest

Texas Foyer and Texas Ballrooms

Conference Reception, Poster Display and Interactive Demos

Texas Blrm V,VI,VII

Exhibition and Interactive Demos

THURSDAY

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 4A: Meshes	**Panel 3:** The Future Visualization Platform	**Session 4C:** Molecules I

Coffee Break

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 5A: Surfaces	**Session 5B:** Lighting and Perception	**Session 5C:** Flow Topology

Lunch Break

Texas Ballroom I

Vis 2005 Open Meeting

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 6A: Large Data	**Session 6B:** Medical Visualization I	**Session 6C:** Finite Element Analysis

Coffee Break

Texas Ballroom I, II, III

Special Session: National Initiatives in Visualizaiton

Tour of University of Texas Facilities

Texas Blrm V,VI,VII

Exhibition and Interactive Demos

FRIDAY

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 7A: Isosurfaces I	**Panel 4:** What Should We Teach in a Scientific Visualization Class?	**Session 7C:** Molecules II

Coffee Break

Texas Blrm I	*Hill Country A-B*	*Texas Blrm II, III*
Session 8A: Isosurfaces II	**Session 8B:** Medical Visualization II	**Session 8C:** Real World

Break

Texas Ballroom I, II, III

Closing Remarks, Best Paper Award, and Capstone Session:

Self Illustrating Phenomena

Pat Hanrahan, *Stanford University*

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Hans Hagen, *University of Kaiserslautern*

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SATURDAY, OCTOBER 9

10:00 a.m. - 6:00 p.m.

Hill Country A-B

Workshop 1: Workshop on Information Visualization Software Infrastructures

Organizers: Jean-Daniel Fekete, *INRIA Futurs,* and Katy Börner, *Indiana University*

Information visualization systems and toolkits are becoming available for a large range of visualization and interaction techniques and are used in diverse application domains. This workshop is aimed at gathering experts involved in building such infrastructures to share their views, understand the issues involved and trying to find ways to avoid fragmentation and improve collaborations.

At the end of the workshop, the position papers as well as the minutes will be turned into a white paper describing the requirements and issues raised during the workshop, as well as the state of the art of existing information visualization software infrastructures.

SUNDAY, OCTOBER 10

8:30 a.m. - 5:30 p.m.

Texas Ballroom II, III

Tutorial 1: Information Visualization and Discovery

Organizer: Georges Grinstein, *University of Massachusetts at Lowell*
Speakers: Daniel Keim, *University of Konstanz,* and Matthew Ward, *Worcester Polytechnic Institute*

This tutorial will provide the necessary background to understand the issues in the development and usage of visualization integrated with data mining and knowledge discovery systems. We will provide a brief history of data visualization and data mining and examine both sample commercial and academic knowledge discovery systems that integrate visualization and data mining. Many slides, videotapes and demonstrations will be provided. *Difficulty: Beginner/Intermediate*

Hill Country C-D

Tutorial 2: Procedural Encoding of Scattered Data, Theory and Applications

Organizer: Kelly Gaither, *University of Texas at Austin*
Speakers: Greg Nielson, *Arizona State University,* Hans Hagen, *University of Kaiserslautern,* and David Ebert, *Purdue University*

Procedural encoding of scattered data sets is an active area of research with great potential for reconstructing surface information and compactly representing large data. The reduced storage requirements allow greater flexibility in the methods for manipulating and analyzing this data interactively. In this course, we will cover both the mathematical foundations behind existing encoding techniques, surface reconstruction methods, and volumetric representations. Additionally, we will present methods for feature analysis in the functional domain and conclude with applications and benefits of functional encoding in the scientific and engineering disciplines. *Difficulty: Intermediate/Advanced*

Hill Country A-B

Workshop 2: Workshop on Parallel Visualization Architectures and Chromium

Organizers: Brian Paul, *Tungsten Graphics, Inc.,* Mike Houston, *Stanford University, and* Praveen Bhaniramka, *SGI*

Ever increasing data sizes coupled with availability of commodity components in recent years has opened up exciting opportunities in handling large data visualization problems using parallel rendering systems. Extending last year's Workshop on Parallel Visualization techniques, this year, we aim to bring together various trends in Parallel Visualization by covering different aspects of the problem and covering more hands-on topics. In addition to covering parallel visualization architectures, we provide an in-depth analysis of Chromium and its applications to parallel visualization problems. Chromium allows OpenGL applications to run on clusters of computers with commodity graphics cards. Among Chromium's uses are sort-first rendering for driving multi-screen mural displays and sort-last rendering for parallel rendering. Chromium is open-source software and hosted at http://chromium.sourceforge.net/.

The workshop will be divided into two main sessions followed by a closing session where the attendees can post questions and discuss open-ended issues

Parallel Visualization Techniques and Applications
- Parallel Rendering Architectures and Issues
- Challenging Visualization Applications
- Performance Analysis of Parallel Visualization Applications
- How tos

Chromium and its applications
- Features and benefits of Chromium
- Downloading, compiling and installing Chromium

Introduction to common Chromium configurations
- Using Chromium's Tilesort SPU for rendering to multi-screen displays
- Sort-last rendering with Chromium
- Using Chromium with several common visualization applications
- Tuning and debugging

Discussion

INFOVIS SYMPOSIUM

1:45 p.m. - 2:30 p.m.

Texas Ballroom I

Papers Preview

Chairs: Matt Ward, *Worcester Polytechnic Institute,* and Tamara Munzner, *University of British Columbia*

InfoVis 2004 Best Paper

A Knowledge Task-Based Framework for Design and Evaluation of Information Visualizations, Robert Amar and John Stasko, *Georgia Institute of Technology*

2:30 p.m. - 3:45 p.m.

Texas Ballroom I

Evaluation

Chair: Lucy Nowell, *ARDA*

An Evaluation of Microarray Visualization Tools for Biological Insight, Purvi Saraiya, Chris North, and Karen Duca, *Virginia Polytechnic Institute and State University*

User Experiments with Tree Visualization Systems, Alfred Kobsa, *University of California, Irvine*

A Comparison of the Readability of Graphs Using Node-Link and Matrix-Based Representations, Mohammad Ghoniem, *Ecole des Mines de Nantes,* Jean-Daniel Fekete, *INRIA,* and Philippe Castagliola, *Ecole des Mines de Nantes*

BREAK 3:45 p.m. - 4:15 p.m.

4:15 p.m. - 5:30 p.m.

Texas Ballroom I

InfoVis Contest

Chairs: Catherine Plaisant, *University of Maryland,* Jean-Daniel Fekete, *INRIA,* and Georges Grinstein, *University of Massachusetts, Lowell*

See p. 19 for list of contest results.

8:00 p.m. - 8:45 p.m.

Texas Ballroom I

InfoVis Fun

Chairs: George Robertson, *Microsoft Research* and Daniel Keim, *University of Konstanz*

MONDAY, OCTOBER 11

8:30 a.m. - 5:30 p.m.

Hill Country A-B

Tutorial 3: GPGPU: General-Purpose Computation on Graphics Processors

Organizer: Aaron Lefohn, *University of California, Davis*
Speakers: Ian Buck, *Stanford University,* John Owens, *University of California, Davis,* and Robert Strzodka, *Caesar Institute, Bonn, Germany*

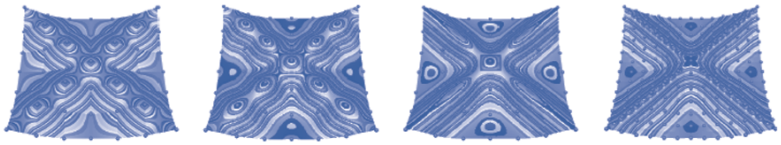
In the last three years, commodity graphics processors (GPUs) have evolved from fixed-function graphics units into powerful data-parallel processors. These streaming processors are capable of sustaining computation rates of greater than ten times that of a single CPU. Researchers in the evolving field of general-purpose computation on graphics processors (GPGPU) have demonstrated mappings to these processors for a wide range of computationally intensive tasks. Examples in the visualization domain include ray tracing, partial differential equation solving, 2D and 3D image processing, and surface processing. This tutorial provides a detailed introduction and overview of the GPGPU field to the visualization community. Attendees will gain an understanding of modern GPU architecture, the GPGPU programming model, and the techniques and tools required to apply GPUs to their own applications. *Difficulty: Intermediate*

Hill Country C-D

Tutorial 4: Advanced Virtual Medicine: Techniques and Applications for Medicine-Oriented Visualization

Organizers: Dirk Bartz, *University of Tübingen,* and Yin Wu, *TeraRecon*
Speakers: Jan Hardenbergh, *TeraRecon,* Klaus Mueller, *Stony Brook University,* and Markus Wacker, *University of Tübingen*

Virtual endoscopy, surgery simulation, soft-tissue simulation MRI motion capture, functional MRI are among the most actively researched topics in virtual medicine and medical-imaging. Both focus on the simulation of medical procedures for training, planning, diagnosis, and prognosis without requiring an invasive intervention. This course covers concepts that are used in research as well as in production systems. *Difficulty: Intermediate*



INFOVIS SYMPOSIUM

VOLVIS SYMPOSIUM

8:30 a.m. - 10:00 a.m.

Texas Ballroom I

Keynote
Chair: Pat Hanrahan, *Stanford University*

From Information Visualization to Sensemaking: Connecting the Mind's Eye to the Mind's Muscles
Stuart Card, *PARC*

Texas Ballroom II, III

Keynote
Chair: Deborah Silver, *Rutgers University*

Quo Vadis, Volvis?
Hanspeter Pfister, *MERL*

BREAK 10:00 a.m. - 10:30 a.m.

10:30 a.m. - 12:15 p.m.

Texas Ballroom I

Techniques and Tools
Chair: Stephen Eick, *Visintuit*

GeoTime Information Visualization, Thomas Kapler and William Wright, *Oculus Info Inc.*

RecMap: Rectangular Map Approximations, Roland Heilmann, Daniel Keim, Christian Panse, and Mike Sips, *University of Konstanz*

EZEL: a Visual Tool for Performance Assessment of Peer-to-Peer File-Sharing Networks, Lucian Voinea, Alex Telea, and Jarke van Wijk, *Technische Universiteit Eindhoven*

A History Mechanism for Visual Data Mining, Matthias Kreuseler, *SD Industries GmbH,* Thomas Nocke and Heidrun Schumann, *University of Rostock*

Texas Ballroom II, III

Hardware Accelerated Techniques
Chair: João Comba, *Federal University of Rio Grande do Sul, Brazil*

Memory Efficient Acceleration Structures and Techniques for CPU-based Volume Raycasting of Large Data, Sören Grimm and Stefan Bruckner, *Vienna University of Technology,* Armin Kanitsar, *Tiani Medgraph AG, and* Eduard Gröller, *Vienna University of Technology*

A Fast High Accuracy Volume Renderer for Unstructured Data, Kenneth Moreland, *Sandia National Laboratories* and Edward Angel, *University of New Mexico*

Hybrid Hardware-Accelerated Image Composition for Sort-Last Parallel Rendering on Graphics Clusters with Commodity Image Compositor, Jorji Nonaka, *Kyoto University,* Nobuyuki Kukimoto, *Tohwa University,* Naohisa Sakamoto, Hiroshi Hazama, and Yasuhiro Watashiba, *Kyoto University*, Xuezhen Liu and Masato Ogata, *Mitsubishi Precision,* Masanori Kanazawa and Koji Koyamada, *Kyoto University*

INFOVIS SYMPOSIUM

VOLVIS SYMPOSIUM

LUNCH BREAK 12:15 p.m. - 1:45 p.m.

1:45 p.m. - 3:45 p.m.

Texas Ballroom I

Multivariate Data
Chair: Leland Wilkinson, *SPSS*

Steerable, Progressive Multidimensional Scaling, Matt Williams and Tamara Munzner, *University of British Columbia*

A Rank-by-Feature Framework for Unsupervised Multidimensional Data Exploration Using Low Dimensional Projections, Jinwook Seo and Ben Shneiderman, *University of Maryland*

Value and Relation Display for Interactive Exploration of High Dimensional Datasets, Jing Yang, Anilkumar Patro, Shiping Huang, Nishant Mehta, Matthew O. Ward, and Elke A. Rundensteiner, *Worcester Polytechnic Institute*

Uncovering Clusters in Crowded Parallel Coordinates Visualizations, Almir Olivette Artero and Maria Cristina Ferreira de Oliveira, *University of São Paulo,* and Haim Levkowitz, *University of Massachusetts, Lowell*

Clutter Reduction in Multi-Dimensional Data Visualization Using Dimension Reordering, Wei Peng, Matthew O. Ward, and Elke A. Rundensteiner, *Worcester Polytechnic Institute*

BREAK 3:45 p.m. - 4:15 p.m.

4:15 p.m. - 4:45 p.m.

Texas Ballroom I

Design Studies
Chair: Helwig Hauser, *VRVis Research Center*

1:30 p.m. - 2:30 p.m.

Texas Ballroom II, III

Transfer Functions
Chair: Kwan-Liu Ma, *University of California, Davis*

Transfer Function Based Adaptive Decompression for Volume Rendering of Large Medical Data Sets, Patric Ljung, Claes Lundström, Anders Ynnerman, and Ken Museth, *Linköping University*

Interactive Transfer Function Control for Monte Carlo Volume Rendering, Balázs Csébfalvi, *Budapest University of Technology and Economics*

2:30 p.m. - 3:45 p.m.

Texas Ballroom II, III

Surfaces & Segmentation
Chair: Bill Lorensen, *General Electric*

Feature Preserving Distance Fields, Huamin Qu, Ran Shao, Nan Zhang, Arie Kaufman, and Klaus Mueller, *Stony Brook University*

Implicit Occluders, Sinésio Pesco, *University of Utah,* Peter Lindstrom and Valerio Pascucci, *LLNL,* and Cláudio Silva, *University of Utah*

Volume Interval Segmentation and Rendering, Praveen Bhaniramka, *Silicon Graphics, Inc.,* Caixia Zhang, Daqing Xue, Roger Crawfis, and Rephael Wenger, *The Ohio State University*

INFOVIS SYMPOSIUM

Texas Ballroom I

Time-Varying Data Visualization using Information Flocking Boids, Andrew Vande Moere, *Key Centre of Design Computing and Cognition*

Artifacts of the Presence Era: Using Information Visualization to Create an Evocative Souvenir, Fernanda Viégas, Ethan Perry, Ethan Howe, and Judith Donath, *MIT Media Lab*

4:45 p.m. - 5:45 p.m.

Texas Ballroom I

InfoVis Poster Preview
Posters Chairs: John Stasko, *Georgia Institute of Technology* and Chris North, *Virginia Polytechnic Institute and State University*

7:00 p.m. - 9:00 p.m.

Texas Ballroom I, II, III

Symposia/Tutorials Reception, InfoVis Poster Session, and Interactive Demos

TUESDAY, OCTOBER 12

8:30 a.m. - 5:30 p.m.

Hill Country C-D

Tutorial 5: An Introduction to Visualization Using VTK
Organizer: Ken Martin, *Kitware*
Speakers: Lisa Avila, Berk Geveci, and William Schroeder, *Kitware*

This tutorial is designed to introduce attendees to the most common visualization techniques and provide concrete examples of these techniques using The Visualization Toolkit. It is designed for attendees who have some programming knowledge but are not experts in the field of visualization. The focus will be on geometric, scalar, and vector field visualization using techniques such as iso-surfacing, direct volume rendering, streamlines, scalar coloring, glyphing, and image processing. *Difficulty: Beginner*

8:30 a.m. - 12:30 p.m.

Hill Country A-B

Tutorial 6: Interactive Texture-Based Flow Visualization
Organizer: Daniel Weiskopf, University of Stuttgart
Speakers: Gordon Erlebacher, *Florida State University,* and Robert S. Laramee, *VRVis*

Interactive texture-based flow visualization has become an active field of research in the last three or four years. Recent progress in this field has led to efficient vector field visualization methods and, in particular, to improved techniques for time-dependent data. This tutorial covers approaches for vector fields given on 2D planes, on surfaces, and within 3D volumes. Both the theoretical background and the GPU-oriented implementations of many of these techniques are presented, along with a demonstration of their usefulness by means of typical applications. *Difficulty: Intermediate*

10:00 a.m. - 6:00 p.m.

Texas Ballroom V, VI, VII

Exhibition and InfoVis Interactive Demos

1:45 p.m. - 5:30 p.m.

Hill Country A-B

Tutorial 7: Feature Oriented Methods in Flow Visualization
Organizer: Gerik Scheuermann, *University of Leipzig*
Speakers: Julia Ebling, *TU Kaiserslautern,* Helwig Hauser, *VRVis Vienna,* Raghu Machiraju, *The Ohio State University,* Ronald Peikert, *ETH Zürich,* and Xavier Tricoche, *University of Utah*

Flow visualization is one of the major topics of this conference since its very beginning. It has shown a fast development over years and triggered new techniques like texture-based methods and feature detection. This tutorial will focus on the last trend and analyze new techniques as well as open questions like vague feature definitions and the dependence on the user. Some of the new developments are: evaluation of detected features to rule out false positives, interactive definition of features supported by information visualization methods like linked views and focus + context visualization, transfer of image processing to vector data, and new topology-oriented algorithms. *Difficulty: Intermediate*

INFOVIS SYMPOSIUM

VOLVIS SYMPOSIUM

8:30 a.m. - 10:00 a.m.

Texas Ballroom I

Evaluation and Perception
Chair: Christopher Healey, *North Carolina State University*

Paint Inspired Color Mixing and Compositing for Visualization, Nathan Gossett and Baoquan Chen, *University of Minnesota*

Texas Ballroom II, III

Rendering
Chair: Klaus Mueller, *Stony Brook University*

SHIC: A View-Dependent Rendering Framework for Isosurfaces, Nan Zhang, Huamin Qu, Wei Hong, and Arie Kaufman, *Stony Brook University*

INFOVIS SYMPOSIUM

Expand-Ahead: A Space-Filling Strategy for Browsing Trees, Michael McGuffin, *University of Toronto,* Gord Davison, *IBM Toronto Laboratory,* and Ravin Balakrishnan, *University of Toronto*

Evaluating a System for Interactive Exploration of Large, Hierarchically Structured Document Repositories, Michael Granitzer, Wolfgang Kienreich, Vedran Sabol, *Know-Center Graz,* Keith Andrews, *Technical University of Graz,* and Werner Klieber, *Know-Center Graz*

Metric-Based Network Exploration and Multiscale Scatterplot, Yves Chiricota, *UQAC,* Fabien Jourdan and Guy Melançon, *LIRMM*

VOLVIS SYMPOSIUM

Texture-Encoded Tetrahedral Strips, Manfred Weiler, *University of Stuttgart,* Paula N. Mallón, *University of Santiago de Compostela,* Martin Kraus, *Purdue University,* and Thomas Ertl, *University of Stuttgart*

3D ROAM for Scalable Volume Visualization, Stéphane Marchesin, *LSIIT,* Jean-Michel Dischler and Catherine Mongenet, *LSIIT ULP*

BREAK 10:00 a.m. - 10:30 a.m.

10:30 a.m. - 12:15 p.m.

Texas Ballroom I

Models and Systems

Chair: Keith Andrews, *Graz University of Technology*

InfoVis 2004 Best Paper

A Knowledge Task-Based Framework for Design and Evaluation of Information Visualizations, Robert Amar and John Stasko, *Georgia Institute of Technology*

Rethinking Visualization: A High-Level Taxonomy, Melanie Tory and Torsten Möller, *Simon Fraser University*

Building Highly-Coordinated Visualizations in Improvise, Chris Weaver, *University of Wisconsin-Madison*

The InfoVis Toolkit, Jean-Daniel Fekete, *INRIA*

Texas Ballroom II, III

Volume Graphics & Volume Applications

Chair: Brian Wylie, *Sandia National Laboratories*

Spatial and Temporal Splitting of Scalar Fields in Volume Graphics, Shoukat Islam, *University of Wales Swansea,* Swapnil Dipankar and Deborah Silver, *Rutgers University,* and Min Chen, *University of Wales Swansea*

Interactive Volume Manipulation with Selective Rendering for Improved Visualization, Vikas Singh and Deborah Silver, *Rutgers University*

Visualization of the Energy-Containing Turbulent Scales, Anders Helgeland, *University of Oslo,* Øyvind Andreassen, Atle Ommundsen, B. Anders and Pettersson Reif, *Norwegian Defence*

INFOVIS SYMPOSIUM

VOLVIS SYMPOSIUM

Research Establishment, Joe Werne, *NorthWest Research Associates,* and Trond Gaarder, *Norwegian Defence Research Establishment*

LUNCH BREAK 12:15 p.m. - 1:45 p.m.

Texas Ballroom I

InfoVis Open Meeting 12:45 p.m. - 1:30 p.m.

1:45 p.m. - 3:45 p.m.

Texas Ballroom I

Graphs

Chair: Sheelagh Carpendale, *University of Calgary*

Topological Fisheye Views for Visualizing Large Graphs, Emden Gansner, Yehuda Koren, and Stephen North, *AT&T Labs-Research*

Matrix Zoom: A Visual Interface to Semi-external Graphs, James Abello, *Rutgers University,* and Frank van Ham, *Technische Universiteit Eindhoven*

Dynamic Drawing of Clustered Graphs, Yaniv Frishman and Ayellet Tal, *Technion*

Interactive Visualization of Small World Graphs, Frank van Ham and Jarke van Wijk, *Technische Universiteit Eindhoven*

Non-Euclidean Spring Embedders, Stephen G. Kobourov and Kevin Wampler, *University of Arizona*

BREAK 3:45 p.m. - 4:15 p.m.

4:15 p.m. - 5:30 p.m.

Texas Ballroom I

Capstone

Chair: Nahum Gershon, *MITRE Inc.*

Visualization as a Medium for Capturing and Sharing Thoughts

Steve Roth, *MAYA Viz, and Carnegie Mellon University*

Closing Remarks

Chair: George Robertson, *Microsoft Research*

Texas Ballroom II, III

Capstone Panel

Chair: Cláudio Silva, *University of Utah*

1996 Retrospective Panel – What is the Future of Volume Visualization & Rendering?

Moderator: Cláudio Silva, *University of Utah*

Chris Johnson, *University of Utah*
Randall Frank, *CEI International*
Michael Meissner, *Viatronix Inc*
Michael Doggett, *ATI*

WEDNESDAY, OCTOBER 13

8:00 a.m. - 10:00 a.m.

Texas Ballroom I, II, III

Opening Remarks and Keynote Session

The Human Visual System: How is its Design Related to the Physics of the Natural Environment?

Dr. Wilson S. Geisler, *The University of Texas at Austin*

The human visual system is the result of evolution by natural selection and hence its design must incorporate detailed knowledge of the physical properties of the natural environment. This is an obvious statement, but the scientific community has been slow to take it seriously. Only recently has there been an increased effort to directly measure the statistical properties of natural scenes and compare them to the design and performance of the human visual system. I will describe some recent studies of the chromatic and geometrical properties of natural materials and natural images, as well as some perceptual and physiological studies designed to test how those physical properties are related to human perceptual mechanisms.

BREAK 10:00 a.m. - 10:30 a.m.

10:00 a.m. - 9:00 p.m.

Texas Ballroom V, VI, VII

Exhibition and Visualization Interactive Demos

10:30 a.m. - 12:30 p.m.

Texas Ballroom I

Session 1A: Volume Rendering I

Chair: Eduard Gröller, *Vienna University of Technology*

Methods for Efficient, High Quality Volume Resampling in the Frequency Domain, Aili Li and Klaus Mueller, *Stony Brook University,* and Thomas Ernst, *Brookhaven National Laboratory*

Linear and Cubic Box Splines for the Body Centered Cubic Lattice, Alireza Entezari, Ramsay Dyer, and Torsten Möller, *Simon Fraser University*

Light Weight Space Leaping Using Ray Coherence, Sarang Lakare and Arie Kaufman, *Stony Brook University*

Projecting Tetrahedra without Rendering Artifacts, Martin Kraus, Wei Qiao, and David S. Ebert, *Purdue University*

Hill Country A-B

Panel 1: Can We Determine the Top Unresolved Problems of Visualization?

Chair: Theresa-Marie Rhyne, *North Carolina State University*

Panelists: Theresa-Marie Rhyne, *North Carolina State University*
Bill Hibbard, *University of Wisconsin at Madison*
Chris Johnson, *University of Utah*
Chaomei Chen, *Drexel University*
Steve Eick, *SSS-Research Inc. & University of Illinois at Chicago*

Texas Ballroom II, III

Session 1C: Flow Visualization I

Chair: David Laidlaw, *Brown University*

Flow Field Clustering via Algebraic Multigrid, Michael Griebel, *University of Bonn,* Tobias Preusser, *University of Bremen/MeVis,* Martin Rumpf, *University of Duisburg,* Marc Alexander Schweitzer, *University of Bonn,* and Alexandru Telea, *Eindhoven University of Technology*

Centroidal Voronoi Tessellation Based Algorithms for Vector Fields Visualization and Segmentation, Qiang Du and Xiaoqiang Wang, *PSU*

Investigating Swirl and Tumble Flow with a Comparison of Visualization Techniques, Robert S. Laramee, *VRVis Research Center,* Daniel Weiskopf, *University of Stuttgart,* Jürgen Schneider, *AVL,* and Helwig Hauser, *VRVis Research Center*

Visualizing Gyrokinetic Simulations, David Crawford, Kwan-Liu Ma, and Min-Yu Huang, *University of California, Davis,* Scott Klasky and Stephane Ethier, *Princeton Plasma Physics Laboratory*

LUNCH BREAK 12:30 p.m. - 1:45 p.m.

1:45 p.m. - 3:45 p.m.

Texas Ballroom I

Session 2A: Volume Rendering II

Chair: Lisa Avila, *Kitware*

Hardware-Accelerated Adaptive EWA Volume Splatting, Wei Chen, *Zhejiang University,* Liu Ren, *Carnegie Mellon University,* Matthias Zwicker, *Massachusetts Institute of Technology,* and Hanspeter Pfister, *MERL*

Generating Sub-Resolution Detail in Images and Volumes Using Constrained Texture Synthesis, Lujin Wang and Klaus Mueller, *Stony Brook University*

Constrained Inverse Volume Rendering for Planetary Nebulae, Marcus Magnor, *MPI Informatik,* Gordon Kindlmann and Charles Hansen, *University of Utah,* and Neb Duric, *University of New Mexico*

Generating Realistic Images from Hydrothermal Plume Data, Kristina Santilli, Karen Bemis, Deborah Silver, Jamshed Dastur, and Peter Rona, *Rutgers University*

Hill Country A-B

Panel 2: In the Eye of the Beholder: The Role of Perception in Scientific Visualization

Chair: Kelly Gaither, *University of Texas at Austin*

Panelists: David Ebert, *Purdue University*
Kelly Gaither, *University of Texas at Austin*
Bill Geisler, *University of Texas at Austin*
David Laidlaw, *Brown University*

Texas Ballroom II, III

Session 2C: Flow Visualization II

Chair: Gerik Scheuermann, *University of Leipzig*

Rendering Implicit Flow Volumes, Daqing Xue, Caixia Zhang, and Roger Crawfis, *The Ohio State University*

Anisotropic Volume Rendering for Extremely Dense, Thin Line Data, Greg Schussman, *Stanford Linear Accelerator Center,* and Kwan-Liu Ma, *University of California, Davis*

Display of Vector Fields Using a Reaction-Diffusion Model, Allen R. Sanderson, Chris R. Johnson, and Robert M. Kirby, *University of Utah*

Physically Based Methods for Tensor Field Visualization, Ingrid Hotz and Louis Feng, *University of California, Davis,* Hans Hagen, *Technical University of Kaiserslautern,* Bernd Hamann, Boris Jeremic and Kenneth Joy, *University of California, Davis*

BREAK 3:45 p.m. - 4:15 p.m.

4:15 p.m. - 5:45 p.m.

Texas Ballroom I

Session 3A: View/Importance Driven Rendering

Chair: Kwan-Liu Ma, *University of California, Davis*

Quick-VDR: Interactive View-Dependent Rendering of Massive Models, Sung-Eui Yoon, Brian Salomon, Russell Gayle, and Dinesh Manocha, *University of North Carolina at Chapel Hill*

Importance-Driven Volume Rendering, Ivan Viola, Armin Kanitsar, and Eduard Gröller, *Vienna University of Technology*

Visibility Culling for Time-Varying Volume Rendering Using Temporal Occlusion Coherence, Jinzhu Gao and Han-Wei Shen, *The Ohio State University,* Jian Huang, *The University of Tennessee,* and James Arthur Kohl, *Oak Ridge National Lab*

Hill Country A-B

Session 3B: Systems

Chair: Greg Johnson, *University of Texas at Austin*

Visualization in Grid Computing Environments, Ken Brodlie *University of Leeds,* David Duce, *Oxford Brookes University,* Julian Gallop *CCLRC,* Musbah Sagar, *Oxford Brookes University,* Jeremy Walton, *NAG Ltd.,* and Jason Wood, *University of Leeds*

Visualizing Competitive Behaviors in Multi-User Virtual Environments, Nate Hoobler and Greg Humphreys, *University of Virginia,* and Maneesh Agrawala, *Microsoft Research*

Scout: A Hardware-Accelerated System for Quantitatively Driven Visualization and Analysis, Patrick S. McCormick, Jeff Inman, and James P. Ahrens, *Los Alamos National Laboratory*, Charles Hansen and Greg Roth, *University of Utah*

Texas Ballroom II, III

Session 3C: Flow Visualization III

Chair: Daniel Weiskopf, *University of Stuttgart*

Vorticity Based Flow Analysis and Visualization for Pelton Turbine Design Optimization, Filip Sadlo and Ronald Peikert, *ETH Zürich,* and Etienne Parkinson, *VA Tech Hydro*

Visualization of Intricate Flow Structures for Vortex Breakdown Analysis, Xavier Tricoche, *University of Utah,* Christoph Garth, *University of Kaiserslautern,* Gordon Kindlmann, *University of Utah,* Eduard Deines, *University of Kaiserslautern,* Gerik Scheuermann, *University of Leipzig,* Markus Ruetten, *DLR Göttingen,* and Charles Hansen, *University of Utah*

A Graphics Hardware-based Vortex Detection and Visualization System, Simon Stegmaier and Thomas Ertl, *University of Stuttgart*

6:00 p.m. - 6:30 p.m.

Hill Country A-C

Visualization Poster Preview

6:30 p.m. - 7:30 p.m.

Hill Country A-C

Visualization Contest

7:30 p.m. - 10:30 p.m.

Texas Foyer and Texas Ballrooms

Conference Reception, Poster Display and Interactive Demos (until 9pm)

THURSDAY, OCTOBER 14

8:30 a.m. - 10:00 a.m.

Texas Ballroom I

Session 4A: Meshes

Chair: Hans Hagen, *University of Kaiserslautern*

Radial Hermite Operators for Scattered Point Cloud Data with Normal Vectors and Applications to Implicitizing Polygon Mesh Surfaces for Generalized CSG Operations and Smoothing, Gregory M. Nielson, *Arizona State University*

Compatible Triangulations of Spatial Decompositions, William J. Schroeder, Berk Geveci and Mathieu Malaterre, *Kitware*

Adaptive 4-8 Texture Hierarchies, Lok M. Hwa, *University of California, Davis*, Mark A. Duchaineau, *Lawrence Livermore National Lab,* and Kenneth I. Joy, *University of California, Davis*

Hill Country A-B

Panel 3: The Future Visualization Platform

Chair: Greg Johnson, *University of Texas at Austin*

Panelists: David Ebert, *Purdue University*
Charles Hansen, *University of Utah*
David Kirk, *NVIDIA Corporation*
Bill Mark, *University of Texas at Austin*
Hanspeter Pfister, *Mitsubishi Electric Research Laboratories*

Texas Ballroom II, III

Session 4C: Molecules I

Chair: Terry Yoo, *National Institutes of Health*

Immersive Design of DNA Molecules with a Tangible Interface, Steven Schkolne, *Caltech,* Hiroshi Ishii, *MIT Media Lab,* and Peter Schröder, *Caltech*

Augmented Reality with Tangible Auto-Fabricated Models for Molecular Biology Applications, Alexandre Gillet, Michel Sanner, Daniel Stoffler, David Goodsell, and Arthur Olson, *The Scripps Research Institute*

TexMol: Interactive Visual Exploration of Large Flexible Multi-component Molecular Complexes, Chandrajit Bajaj, Peter Djeu, Vinay Siddavanahalli, and Anthony Thane, *University of Texas at Austin*

BREAK 10:00 a.m. - 10:30 a.m.

10:00 a.m. - 2:00 p.m.

Texas Ballroom V, VI, VII

Exhibition, Vis Poster Display and Interactive Demos

10:30 a.m. - 12:30 p.m.

Texas Ballroom I

Session 5A: Surfaces

Chair: Torsten Möller, *Simon Fraser University*

Rough Interface Reconstruction Using the Level Set Method, Yootai Kim, Raghu Machiraju and David Thompson, *Mississippi State University*

Surface Reconstruction of Noisy and Defective Data Sets, Hui Xie, Kevin T. McDonnell and Hong Qin, *Stony Brook University*

Optimal Global Conformal Surface Parameterization, Miao Jin, *University of Florida,* Yalin Wang, *UCLA,* Shing-Tung Yau, *Harvard,* Xianfeng Gu, *University of Florida*

Local and Global Comparison of Continuous Functions, Herbert Edelsbrunner, John Harer, and Vijay Natarajan, *Duke University,* and Valerio Pascucci, *Lawrence Livermore National Laboratory*

Hill Country A-B

Session 5B: Lighting and Perception

Chair: Victoria Interrante, *University of Minnesota*

Light Collages: Lighting Design for Effective Visualization, Chang Ha Lee, Xuejun Hao, and Amitabh Varshney, *University of Maryland*

Lighting Transfer Functions Using Gradient Aligned Sampling, Eric B. Lum and Kwan-Liu Ma, *University of California, Davis*

Haptic Display of Interaction between Textured Models, Miguel A. Otaduy, Nitin Jain, Avneesh Sud, and Ming C. Lin, *University of North Carolina at Chapel Hill*

On the Role of Color in the Perception of Motion in Animated Visualizations, Daniel Weiskopf, *University of Stuttgart*

Texas Ballroom II, III

Session 5C: Flow Topology

Chair: Patrick Moran, *NASA Ames Research Center*

Topological Lines in 3D Tensor Fields, Xiaoqiang Zheng and Alex Pang, *University of California, Santa Cruz*

Stream Line and Path Line Oriented Topology for 2D Time-Dependent Vector Fields, Holger Theisel, *MPI Informatik Saarbrücken,* Tino Weinkauf and Hans-Christian Hege, *Zuse Institute Berlin,* and Hans-Peter Seidel, *MPI Informatik Saarbrücken*

Tracking of Vector Field Singularities in Unstructured 3D Time-Dependent Datasets, Christoph Garth, *University of Kaiserslautern,* Xavier Tricoche, *SCI Institute,* and Gerik Scheuermann, *University of Leipzig*

Topology Visualization of the Optical Power Flow through a Novel C-Shaped Nano-Aperture, Liying Sun, *Stanford University,* Rajesh K. Batra, *Intel Corporation,* Xiaolei Shi, *GE Global Research Center,* and Lambertus Hesselink, *Stanford University*

LUNCH BREAK 12:30 p.m. - 1:45 p.m.

Texas Ballroom I

Vis 2005 Open Meeting 12:45 p.m. - 1:30 p.m.

1:45 p.m. - 3:45 p.m.

Texas Ballroom I

Session 6A: Large Data

Chair: Eric Greenwade, *Idaho National Engineering and Environmental Laboratory*

Interactive Exploration of Large Remote Micro-CT Scans, Steffen Prohaska, Andrei Hutanu, Ralf Kähler, and Hans-Christian Hege, *Zuse Institute Berlin*

Interactive Terascale Particle Visualization, David Ellsworth, Bryan Green, and Patrick Moran, *NASA Ames Research Center*

Intuitive and Interactive Modification of Large Finite Element Models, Dirc Rose, Katrin Bidmon, and Thomas Ertl, *University of Stuttgart*

Visualization of Salt-Induced Stress Perturbations, Patricia Crossno, David H. Rogers, and Rebecca M. Brannon, *Sandia National Laboratories,* and David Coblentz, *Los Alamos National Laboratories*

Hill Country A-B

Session 6B: Medical Visualization I

Chair: Dirk Bartz, *University of Tübingen*

Exploration of the Brain's White Matter Pathways with Dynamic Queries, David Akers, Anthony Sherbondy, Rachel Mackenzie, Robert Dougherty, and Brian Wandell, *Stanford University*

The VesselGlyph: Focus & Context Visualization in CT Angiography, Matús Straka, *Austrian Academy of Sciences,* Michal Cervenanský, *Comenius University, Bratislava,* Alexandra La Cruz, *Vienna University of Technology,* Arnold Köchl, *Vienna University of Medicine,* Milos Srámek, *Austrian Academy of Sciences,* Eduard Gröller, *Vienna University of Technology,* and Dominik Fleischmann, *Austrian Academy of Sciences*

Non-linear Model Fitting to Parameterize Diseased Blood Vessels, Alexandra La Cruz, *Vienna University of Technology,* Matús Straka *Austrian Academy of Sciences,* Arnold Köchl, *Vienna University of Medicine,* Milos Srámek, *Austrian Academy of Sciences,* Eduard Gröller, *Vienna University of Technology,* and Dominik Fleischmann, *Stanford University Medical Center*

Visualizing Cortical Waves and Timing from Data, Kay A. Robbins, Mark Robinson, and David M. Senseman, *University of Texas at San Antonio*

Texas Ballroom II, III

Session 6C: Finite Element Analysis

Chair: David Kao, *NASA Ames Research Center*

Rendering Planar Cuts Through Quadratic and Cubic Finite Elements, Michael Brasher and Robert Haimes, *Massachusetts Institute of Technology*

LoD Volume Rendering of FEA Data, Shyh-Kuang Ueng, Yan-Jen Su, and Chi-Tang Chang, *National Taiwan Ocean University*

Pixel-Exact Rendering of Spacetime Finite Element Solutions, Yuan Zhou, Michael Garland, and Robert Haber, *University of Illinois at Urbana-Champaign*

TetSplat: Real-time Rendering and Volume Clipping of Large Unstructured Tetrahedral Meshes, Ken Museth, *Linkoping Institute of Technology* and Santiago Lombeyda, *California Institute of Technology*

BREAK 3:45 p.m. - 4:15 p.m.

4:15 p.m. - 5:30 p.m.

Texas Ballroom I,II,III

Special Session: National Initiatives in Visualizaiton

This panel will bring together representatives from the government and from the visualization community to talk about recent national initiatives in visualization and about how researchers can and should participate. It will be an opportunity for conference attendees to learn about these efforts and to begin talking and even arguing about them and their effects on the future development of visualization.

6:30 p.m. - 8:00 p.m.

Tour of University of Texas Facilities

TACC and Sun Microsystems will host an Open House of the TACC Visualization Laboratory featuring the Sun Terascale Remote Visualization System. Come see the exciting research and development that is being conducted at the University of Texas at Austin and enjoy complimentary food and beverage. Transportation will be provided.

FRIDAY, OCTOBER 15

8:30 a.m. - 10:00 a.m.

Texas Ballroom I

Session 7A: Isosurfaces I

Chair: T.J. Jankun-Kelly, *Mississippi State University*

Efficient Point-Based Isosurface Exploration Using the Span-Triangle, Bartosz von Rymon-Lipinski, Nils Hanssen, Thomas Jansen, Lutz Ritter, and Erwin Keeve, *Research center caesar*

Volume Refinement Fairing Isosurfaces, Martin Bertram, *TU Kaiserslautern*

Interactive Point-Based Isosurface Extraction, Yarden Livnat and Xavier Tricoche, *SCI Institute*

Hill Country A-B

Panel 4: What Should We Teach in a Scientific Visualization Class?

Chair: Jon D. Genetti, *University of Alaska Fairbanks*

Panelists: Mike J. Bailey, *Oregon State University*
Jon D. Genetti, *University of Alaska Fairbanks*
David H. Laidlaw, *Brown University*
Robert J. Moorhead, *Mississippi State University*
Ross T. Whitaker, *University of Utah*

Texas Ballroom II, III

Session 7C: Molecules II

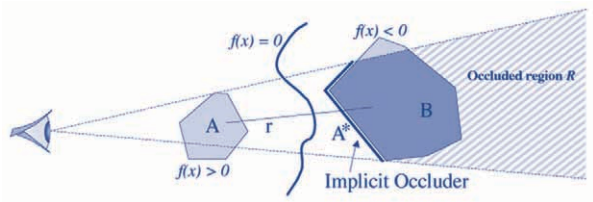
Chair: Elizabeth Jurrus, *University of Utah*

Detection and Visualization of Anomalous Structures in Molecular Dynamics Simulation Data, Sameep Mehta, Kaden Hazzard, and Raghu Machiraju, Srinivasan Parthasarathy, *and* John Wilkins, *The Ohio State University*

PQuad: Visualization of Predicted Peptides and Proteins, Susan L. Havre, Mudita Singhal, Deborah A. Payne, and Bobbie-Jo M. Webb-Robertson, *Pacific Northwest National Laboratory*

Guaranteed Quality Triangulation of Molecular Skin Surfaces, Ho-Lun Cheng and Xinwei Shi, *NUS*

BREAK 10:00 a.m. - 10:30 a.m.



10:30 a.m. - 12:00 p.m.

Texas Ballroom I

Session 8A: Isosurfaces II

Chair: Ken Martin, *Kitware*

Dual Contouring with Topology-Preserving Simplification Using Enhanced Cell Representation, Nan Zhang, Wei Hong and Arie Kaufman, *Stony Brook University*

Simplifying Flexible Isosurfaces Using Local Geometric Measures, Hamish Carr, *University of British Columbia,* Jack Snoeyink, *University of North Carolina at Chapel Hill,* and Michiel van de Panne, *University of British Columbia*

Dual Marching Cubes, Gregory M. Nielson, *Arizona State University*

Hill Country A-B

Session 8B: Medical Visualization II

Chair: Jon Genetti, *University of Alaska, Fairbanks*

STEPS - an Application for Simulation of Transsphenoidal Endonasal Pituitary Surgery, André Neubauer, *VRVis Research Center,* Stefan Wolfsberger and Marie-Thérèse Forster, *Medical University Vienna,* Lukas Mroz, *Tiani Medgraph AG,* Rainer Wegenkittl and Katja Bühler, *VRVis Research Center*

Interactive Thickness Visualization of Articular Cartilage, Matej Mlejnek, Anna Vilanova and Eduard Gröller, *Vienna University of Technology*

ImageSurfer: A Tool for Visualizing Correlations between Two Volume Scalar Fields, Dennis Jen, Peter Parente, Jonathan Robbins, Christopher Weigle, Russell M. Taylor II, Alain Burette, and Richard Weinberg, *University of North Carolina at Chapel Hill*

Texas Ballroom II, III

Session 8C: Real World

Chair: Jörg Meyer, *University of California, Irvine*

Interactive Design of Multi-Perspective Images for Visualizing Urban Landscapes, Augusto Román, Gaurav Garg, and Marc Levoy, *Stanford University*

Real-Time Motion Estimation and Visualization on Graphics Cards, Robert Strzodka, *caesar,* and Christoph Garbe, *Interdisciplinary Center for Scientific Computing*

Dispersion Simulation and Visualization For Urban Security, Feng Qiu, Ye Zhao, Zhe Fan, Xiaoming Wei, Haik Lorenz, Jianning Wang, Suzanne Yoakum-Stover, Arie Kaufman, and Klaus Mueller, *Stony Brook University*

BREAK 12:00 p.m. - 12:30 p.m.

12:30 p.m. - 2:00 p.m.

Texas Ballroom I, II, III

Closing Remarks, Best Paper Award, and Capstone:
Chair: Kelly Gaither, *University of Texas at Austin*

Self Illustrating Phenomena, Pat Hanrahan, *Stanford University*
A self-illustrating phenomenon is an image which exposes the science behind it. (I first saw this term in H. Robin's book, "The Scientific Image"). Some famous examples are pictures of iron filings aligned along magnetic lines of force, sand particles collecting at the stationary points of the standing waves of a violin, stress in a mechanical part revealed through birefringence, and particle tracks in a bubble chamber. Such images brilliantly combine experimental design, analysis, and visualization. Quoting J. Tukey, "the general purposes of conducting experiments and analyzing data match, point by point." I will argue in this talk that computer tools for visual analysis should normally be conceived of as aids in constructing computational visual experiments; and that the resulting visualizations be consciously designed to help validate or invalidate the hypothesis being tested by the experiment.

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IMAGE CREDITS

p2: **Importance-Driven Volume Rendering,** Ivan Viola, Armin Kanistar, and Eduard Gröller

p8: **Volume Refinement Fairing Isosurfaces,** Martin Bertram

p 16: **Implicit Occluders,** Sinésio Pesco, Peter Lindstrom, Valerio Pascucci, and Cláudio Silva

POSTERS

InfoVis Poster Session
Sunday - Tuesday Texas Ballroom IV

I1: TextPool: Visualizing Live Text Streams, Conrad Albrecht-Buehler, *Northwestern Univ,* et al.

I2: BinX: Dynamic Exploration of Time Series Datasets Across Aggregation Levels, Lior Berry, *Univ. of British Columbia,* et al.

I3: PhylloTrees: Harnessing Natureís Phyllotactic Patterns for Tree Layout, Sheelagh Carepndale, *Univ. of Calgary,* et al.

I4: DECIDE, Diane Cluxton, *SSS Research Inc.,* et al.

I5: An Experimental Investigation of Magnification Lens Offset and Its Impact on Imagery Analysis, Erika Darling, *MITRE Corporation,* et al.

I6: Visualizing E-mail with a Semantically Zoomable Interface, Ellen Diep, *Tufts Univ.,* et al.

I7: Interactive Exploration of the AFS File System, Joshua Foster, *Univ. of North Carolina at Charlotte,* et al.

I8: ARNA: Interactive Comparison and Alignment of RNA Secondary Structure, Gerald Gainant, *Univ. of Bordeaux,* et al.

I9: Tracking User Interactions Within Visualizations, Dennis Groth, *Indiana Univ.,* et al.

I10: Visual Mining of Business Process Data, Ming Hao, *Hewlett Packard Research Labs.,* et al.

I12: Interactive Visualization approaches to the Analysis of System Identification Data, Jimmy Johansson, *Linkoping Univ.,* et al.

I13: VIM: A Framework for Intelligence Analysis, T. Alan Keahey, *Visintuit LLC,* et al.

I14: Visual Browsing of Remote and Distributed Data, Parthasarathy Krishnaswamy, *Univ. of Illinois, Chicago,* et al.

I15: Resource Systems Reference Database, David Lu, *Futurefarmers,* et al.

I16: faMailiar - Intimacy-based Email Visualization, Mirko Mandic, *Texas A&M,* et al.

I17: Visualizing and Interacting with Multi-tree Hierarchical Data, Mahnas Jean Mohammadi-Aragh, *Mississippi State Univ.,* et al.

I18: EventScope: Bringing Remote Experience of Mars to the Public through Telepresence, Eben Myers, *Platform Digital LLC,* et al.

I19: Histographs: Interactive Clustering of Stacked Graphs, Pin Ren, *Northwestern Univ.,* et al.

I20: RankSpiral: Toward Enhancing Search Results Visualizations, Anselm Spoerri, *Rutgers Univ.*

I21: Creating and Managing "Lookmarks" in ParaView, Eric Stanton, *Sandia National Labs.,* et al.

I22: Visualizing high dimensional datasets using Partiview, Dinoj Surendran, *Univ. of Chicago,* et al.

I23: Distortion-based Visualization for Long-term Continuous Acoustic Monitoring, Fujio Tsutsumi, *Central research Institute of Electric Power Industry, Japan,* et al.

Vis Poster Session
Wednesday - Friday Texas Ballroom IV

V1: VisBiz: A Simplified Visualization of Business Operation, Ming C. Hao, *Hewlett Packard Research Laboratories,* et al.

V2: 2D Maps for Visual Analysis and Retrieval in Large Multi-Feature 3D Model Databases, Benjamin Bustos, *Univ. of Konstanz, Germany,* et al.

V3: Hierarchy based 3D Visualization of Large Software Structures, Michael Balzer, *Univ. of Konstanz, Germany,* et al.

V4: Linking Representation with Meaning, David Duke, *Univ. of Leeds, UK*

V5: Introducing Topological Attributes for Objective-Based Visualization, Yuriko Takeshima, *JAERI,* et al.

V6: Building an Ontology of Visualization, David Duke, *Univ. of Leeds,* et al.

V7: Context-adaptive Mobile Visualization and Information Management, Jochen Ehret, *DFKI,* et al.

V8: Visual Inspection Methods for Quality Control in Automotive Engineering, Hans Hagen, *Univ. of Kaiserslautern,* et al.

V9: Code Checking and Visualization of an Architecture Design, Rong Xu, *National Univ. of Singapore,* et al.

V10: DaMI - Data Management for Multimedial Information Systems, Hans Hagen, *DFKI,* et al.

V11: Depth Enhanced Panoramas, Gleb Bahmutov, *Purdue University,* et al.

V12: Live Range Visibility Constraints for Adaptive Terrain Visualization, Xiaohong Bao, *Univ. of California, Irvine,* et al.

V13: Visualizing botanical trees over four seasons, Derek Bradley, *Carleton Univ., Canada*

V14: Modeling Decomposing Objects under Combustion, Zeki Melek, *Texas A&M Univ.,* et al.

V15: Visualizing the Energetics of the Dissociation of a Metastable Molecule, David Guzman, *Univ. of Texas at Austin,* et al.

V16: gSlick - Grid-Enabled Collaborative Scientific Visualization Environment, Eric Wyatt, *Northern Arizona Univ.*, et al.

V17: Vol-a-Tile - a Tool for Interactive Exploration of Large Volumetric Data on Scalable Tiled Displays, Nicholas Schwarz, *Univ. of Illinois at Chicago,* et al.

V18: Visualization of Vortices in Simulated Airflow around Bat Wings During Flight, Eduardo Hueso, *Brown Univ.,* et al.

V19: Visualization of Topological Defects in Nematic Liquid Crystals Using Streamtubes, Streamsurfaces and Ellipsoids, Vadim A. Slavin, *Brown Univ.*, et al.

V20: Visualizing Turbulent Flow, Greg P. Johnson, *The Univ. of Texas at Austin,* et al.

V21: Visualizing the Evolution of Horned Lizards Using 3D Morphing Techniques, Reuben Reyes, *Univ. of Texas at Austin*, et al.

V22: Visualization of Nanoparticle Formation in Turbulent Flows, P. Coleman Saunders, *Univ. of Minnesota,* et al.

V23: Interactive Poster: Illustrating Different Convection Velocities of Turbulent Flow, Timothy Urness, *Univ. of Minnesota,* et al.

V24: Vector Wavelet Thresholding for Vector Field Denoising, Michel Westenberg, *Univ. of Stuttgart, Germany,* et al.

V25: Fast Rendering of Foveated Volume in the Wavelet Domain, Hang Yu, *National Univ. of Singapore,* et al.

V26: Atlas-Aware Laplacian Smoothing, Peter G. Sibley, *Brown Univ.,* et al.

V27: On the Visualization of Time-Varying Structured Grids Using a 3D Warp Texture, Yuan Chen, *Johns Hopkins Univ.,* et al.

V28: DTI Fiber Clustering in the Whole Brain, Song Zhang, *Brown Univ.,* et al.

V29: Visualization of the Interaction of Multiple Sclerosis Lesions with Adjacent White Matter Fibers Using Streamtubes and Streamsurfaces, Song Zhang, *Brown Univ.,* et al.

V30: Capillary Histology Imagery Visualization and Exploration, Michael Gleicher, *Univ. of Wisconsin-Madison,* et al.

V31: Compression, Segmentation, and Modeling of Large-Scale Filamentary Volumetric Data, Bruce H. McCormick, *Texas A&M Univ.,* et al.

V32: Force-Feedback-Enhanced Navigation for Interactive Visualization of Coronary Vessels, Thomas Wischgoll, *Univ. of California, Irvine,* et al.

V33: Automatic Fast Detection of Tumor Suspect Areas on CT Scan, Matei Mancas, *Faculté Polytechnique de Mons*, et al.

V34: Real-Time Volume Rendering of Four Channel Data Sets, Jürgen P. Schulze, *Brown Univ.*, et al.

V35: JointViewer - an interactive system for exploring orthopedic data, G. Elisabeta Marai, *Brown Univ.,* et al.

INTERACTIVE DEMONSTRATION LAB

Symposia
Tuesday Texas Ballroom V

IDL S1: Automatic Fast Detection of Tumor Suspect Areas on CT Scan using Asymmetry, Matei Mancas, Bernard Gosselin, and Benoit Macq, *Faculté Polytechnique de Mons (FPMs), Belgium*

IDL S2: Visual Inspection Methods for Quality Control in Automotive Engineering, Ralf Klein, Jochen Ehret, Andreas Disch, Dirk Zeckzer, Sascha Koehn, and Michael Muenchhofen, *DFKI, Kaiserslautern, Germany*

IDL S3: PQuad: Enabling Visual Analysis of Predicted Peptides and Proteins, Mudita Singhal and Susan Havre, *Pacific Northwest National Laboratory*

IDL S4: An Interactive Data Management System for Virtual Walk-Throughs, Inga Scheler, Hans Hagen, Gerhard Steinebach, Michael Muenchhofen, Maja Ruby, and Michael Wadle, *Development Agency Rheinland-Pfalz, University of Technology Kaiserslautern, Germany*

IDL S5: Interactive Exploration of Multi-channel Biological Data Sets, Jürgen P. Schulze and Alexander Rice, *Brown University*

IDL S6: Vision, a Software Component for the Visual Integration of Heterogeneous Software and Data, Michel Sanner, *The Scripps Research Institute*

IDL S7: Large-scale, Multimodal, Multiresolution Data Integration, Analysis, and Visualization, Tony Pan, Joel Saltz, Don Stredney, Jason Bryan, Dennis Sessanna, and Shannon Hastings, *The Ohio State University*

IDL S8: Visualization of the Visual-D Challenge Problem, Rhonda Vickery, Paul Adams, and Willie Johnson, *DoD HPC PET & Mississippi State University*

IDL S9: Augmented Reality with Tangible Auto-Fabricated Models for Molecular Biology Application, Alexandre Gillet, Michel Sanner, and Arthur Olson, *The Scripps Research Institute*

IDL S10: Intersurf: A VMD Plugin for Interface Extraction Between Proteins, Xavier Cavin and Nicolas Ray, *INRIA Lorraine*

IDL S11: Volume Extractor - Visualization, Segmentation, and 3D Model Construction System from 3D Medical Images, Akio Doi and Fumihito Itoh, *Iwate Prefectural University*

IDL S12: A Method for Generating Virtually Stretched Views of Organs Based on Volumetric Image Deformation and its Application to Medical Image Diagnosis, Kensaku Mori, Truong Trung Dung, Masahiro Oda, Takayuki Kitasaka, and Yasuhito Suenaga, *Nagoya University, Japan*

Visualization Conference
Wednesday / Thursday Texas Ballroom V

IDL M1: Automatic Fast Detection of Tumor Suspect Areas on CT Scan using Asymmetry, Matei Mancas, Bernard Gosselin, and Benoit Macq, *Faculté Polytechnique de Mons (FPMs)*

IDL M2: Force-Feedback-Enhanced Navigation for Interactive Visualization of Coronary Vessels, Thomas Wischgoll, Elke Moritz, and Jörg Meyer, *University of California, Irvine*

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IDL M5: An Interactive Data Management System for Virtual Walk-Throughs, Inga Scheler, Hans Hagen, Gerhard Steinebach, Michael Muenchhofen, Maja Ruby, and Michael Wadle, *Development Agency Rheinland-Pfalz, University of Technology Kaiserslautern, Germany*

IDL M6: Digital Earth PC: NASA's Interactive Image Viewer on a 3-dimensional Model of the Earth, Eric Sokolowsky, *Global Science and Technology, NASA*

IDL M7: Interactive Exploration of Multi-channel Biological Data Sets, Jürgen P. Schulze, and Alexander Rice, *Brown University*

IDL M8: Vision, a Software Component for the Visual Integration of Heterogeneous Software and Data, Michel Sanner, *The Scripps Research Institute*

IDL M9: Large-scale, Multimodal, Multiresolution Data Integration, Analysis, and Visualization, Tony Pan, Joel Saltz, Don Stredney, Jason Bryan, Dennis Sessanna, and Shannon Hastings, *The Ohio State University*

IDL M10: TexMol: An Interactive Demo of Rendering Large Multi-Component Molecular Complexes, Peter Djeu, *University of Texas at Austin*

IDL M11: Visualization of Time-Varying Structured Grids Using a 3D Warp Texture, Jonathan Cohen, Yuan Chen, Subodh Kumar, *Johns Hopkins University*

IDL M12: Interactive Terascale Particle Visualization, David Ellsworth, Bryan Green, and Patrick Moran, *AMTI/NASA Ames Research Center*

IDL M13: Visualization of the Visual-D Challenge Problem, Rhonda Vickery, Paul Adams, and Willie Johnson, *DoD HPC PET & Mississippi State University*

IDL M14: Augmented Reality with Tangible Auto-Fabricated Models for Molecular Biology Application, Alexandre Gillet, Michel Sanner, and Arthur Olson, *The Scripps Research Institute*

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INFOVIS 2004 CONTEST RESULTS

First place:

Major Information Visualization Authors, Papers and Topics in the ACM Library, Weimao Ke, Katy Börner, and Lalitha Viswanath, *Indiana University*

IN-SPIRE InfoVis 2004 Contest Entry, Pak Chung Wong, Beth Hetzler, Christian Posse, Mark Whiting, Susan Havre, Nick Cramer, Anuj Shah, Mudita Singhal, Alan Turner, and Jim Thomas, *Pacific Northwest National Laboratory*

Understanding Eight Years of InfoVis Conferences using PaperLens, Bongshin Lee, *University of Maryland,* Mary Czerwinski, *Microsoft Research,* George Robertson, *Microsoft Research,* and Benjamin B. Bederson, *University of Maryland*

First place: Student

WilmaScope Graph Visualisation, Adel Ahmed, Tim Dwyer, Colin Murray, Le Song, and Ying Xin Wu, *University of Sydney, Australia*

Second Place:

Case Study: Visualizing Visualization, Frank van Ham, *Technische Universiteit Eindhoven*

Exploring and Visualizing the History of InfoVis, Daniel A. Keim, Christian Panse, Mike Sips, Jörn Schneidewind, and Helmut Barro, *University of Konstanz*

InfoVisExplorer, Jaroslav Tyman, Grant P. Gruetzmacher, and John Stasko, *Georgia Institute of Technology*

An Associative Information Visualizer, Xia Lin, Jan Buzydlowski, and Howard D. White, *Drexel University*

MonkEllipse: Visualizing the History of Information Visualization, Tzu-Wei Hsu, Lee Inman Farabaugh, Dave McColgin, and Kevin Stamper, *Georgia Institute of Technology*

Exploring InfoVis Publication History with Tulip, Maylis Delest, *Université de Bordeaux I,* Tamara Munzner, *University of British Columbia,* David Auber and Jean-Philippe Domenger, *LaBRI, Université de Bordeaux I*

Information Visualization Research: Citation and Co-Citation Highlights, Chaomei Chen, *Drexel University*

One-For-All: Visualization of the Information Visualization Symposia, Soon Tee Teoh and Kwan-Liu Ma, *University of California, Davis*

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