







Sponsored by the IEEE Computer Society Visualization and Graphics Technical Committee (VGTC). in cooperation with ACM.

Velcome

Welcome to VisWeek 2010. the umbrella conference for the IEEE Visualization (Vis), Information Visualization (InfoVis), and Visual Analytics Technology (VAST) Science and Conferences, as well as the Symposium on Software Visualization and a variety of workshops, tutorials, and panels relating to visualization.

This year, the technical community will present a varied program covering a wide array of topics relating to the analysis and visual presentation of scientific data, software, and information. 2010 is our fifth year cooperating with the IEEE Computer Society to distribute the Vis and InfoVis papers to a larger readership through the IEEE *Transactions on Visualization and Computer Graphics (TVCG)*.

The papers in these conferences spotlight the most innovative research results in the most relevant and important areas of visualization. This large venue will foster interactions between researchers from government, academic, industrial, and venture communities. The panels discuss some of the most pressing current and innovative topics, while the workshops and tutorials offer a range of learning opportunities for both novice and experienced practitioners. A set of poster sessions throughout the week allow for very current results to be presented in informal, interactive sessions. The annual PhD Colloquium allows for interaction between current experts and the next generation of visualization researchers. A diverse collection of exhibitions, challenges, and contests provides researchers and practitioners opportunities to see and experiment with new applications, methods, and technologies.

Wednesday evening's reception and dinner and numerous breaks throughout the week, combined with outstanding accommodations at the Grand America Hotel in Salt Lake City will provide excellent opportunities to interact with peers and colleagues in a comfortable, convenient setting. This is the place where visualization researchers come together to meet, learn from each other, and have fun!

Thank you for coming, and enjoy your VisWeek!

Ross Whitaker, University of Utah Cláudio T. Silva, University of Utah Klaus Mueller, Stony Brook University VisWeek 2010 General Chairs

Sheelagh Carpendale (InfoVis), University of Calgary Brian Fisher (VAST), Simon Fraser University William Pike (VAST), Pacific Northwest National Laboratory Cláudio T. Silva (Vis), University of Utah Alexandru C. Telea (SoftVis), University of Groningen VisWeek 2010 Conference Chairs

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Discovery Exhibition
Supporters & Exhibitors

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IEEE Visualization and Graphics Technical Committee

For information on awards, national initiatives, conferences and symposia, and a comprehensive membership directory, please visit http://vgtc.org/wpmu/techcom.

Map Grand America Hotel



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1 Conference Registration

Located in Grand Blrm Registration Area Saturday, 6:00 pm - 9:00 pm Sunday-Monday, 7:30 am - 4:30 pm Tuesday, 7:30 am - 4:30 pm Wednesday-Thursday, 7:30 am - 6pm

2 Birds-of-a-Feather (BOF) Board

Check the board for conference times and locations. All conference attendees are welcome.

Posters, Interactive Demos, & Discovery Exhibition

Located in Grand Ballroom Reception Sunday, 9:00 am - Thursday 8:00 pm Posters Hosted Viewing: Mon 6:15 pm - 7:15 pm Wed 6:00 pm - 7:00 pm

4 Exhibition

Located in Grand Ballroom A Tuesday, 10:00 am - 6:00 pm Wednesday, 10:00am - 7:00 pm Thursday, 10:00 am - 6:00 pm

5 Internet Access

Located in Vienna Sunday-Thursday, 7:30 am - 5:00 pm Friday 7:30 am - 12:00 pm

6 Speaker Preparation

Located in Bagatelle Sunday-Thursday, 7:30 am - 5:00 pm Friday, 7:30 am - 9:00 am

About Salt Lake City

Salt Lake City offers attendees the amenities of a large metro city while also providing the opportunity for numerous recreational activities in the surrounding area. With abundant performance art and theater groups, over twenty art galleries, and spectacular views of Utah's Wasatch Mountains, Salt Lake City is the perfect backdrop for IEEE VisWeek 2010.



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VisWeek 2010



At-a-Clance



8:30am - 5:55pm

O VisWeek Workshop

Imperial Ballroom A

Extreme Scale Visual Analytics Organizers: Hanspeter Pfister, Patrick McCormick, Haesun Park, David Ebert, Lee Wilkinson

Scientific sensors and applications are continuing to produce data at ever increasing rates. The social sciences and humanities are transitioning to quantitative disciplines with access to vast amounts of online data. And ever more sophisticated sensor networks are monitoring traffic, energy usage patterns, or ocean pollution levels around us. This explosion of data is overwhelming our capabilities to explore, analyze, hypothesize, and thus fully interpret the underlying details. These tasks will become even more challenging as we make advancements from petascale to exascale computing.

The primary goal of the workshop is to bring together researchers in Computer Science, Computational Science, Mathematics, Statistics, Visualization, and related areas working on large scale high dimensional data analysis with a potential impact in Data and Visual Analytics. The workshop should provide an opportunity to discuss and explore issues of scale and complexity in data and visual analytics and advanced technical developments related to the issues. Increasing amounts of data, regarding both number of data points and dimensionality, and related issues such as efficient and effective data representation and transformation, visual representation in limited screen space and real time visual interaction present new challenges that are fundamental to the continued success of the field. We plan to investigate these challenges and discuss promising directions.

Topics include:

- Analytics and visualization for extremely high dimensional data
- Real time and scalable computational methods for visual analytics of massive data.
- Programming support
- Parallel and high performance computing in visual analytics
- Speedup vs. accuracy trade-off in visual analytics
- Fundamental limits and theory
- Visual analytics on limited computational platforms

O VisWeek Workshop

Imperial Ballroom B

Visual Analytics in Health Care Organizers: David Gotz, Jimeng Sun

Health care data, collected as longitudinal electronic health records (EHRs), medical images, fMRI and gene sequences becomes more and more available in practice. However, it is increasingly challenging for practitioners to quickly find and extract the relevant information at the point of care. Solutions to these challenges will require multi-disciplinary visual analytics solutions that combine efforts across several intersecting research communities: data mining, visualization and visual analytics, medicine, and medical informatics. The workshop will allow us to both review ongoing research in these fields and identify the grand challenges that must be solved at the intersection of these communities to make significant impact on the practice of health care.

ogram Details

8:30am - 12:10pm

O VisWeek Tutorial

Imperial Ballroom CD **Machine Learning for Information Visualization** Organizers: Guy Lebanon, Fei Sha

This tutorial will introduce a wide variety of machine learning techniques, focusing on methods that are particularly relevant to visualization and analysis of complex and high dimensional data. Case studies of applying these methods to real-world problems will be presented and discussed. The audience will gain understanding and insight of how to apply machine learning techniques to different information visualization tasks.

The first part of the tutorial will describe basic concepts and paradigms in machine learning, laying the foundation for the rest of the tutorial. The second part will cover state-of-the-art techniques commonly used for information visualization: clustering, density estimation, classification, regression, and dimensionality reduction. The third part will discuss various application examples and practical issues. The fourth part presents a brief discussion of more advanced topics in machine learning.

O VisWeek Tutorial

Grand Ballroom D

Applying Color Theory to Visualization Organizer: Theresa-Marie Rhyne

We highlight the visual impact of specific color combinations and provide practical suggestions on digital color mixing for visualization. The successful application of color theory is a key component in the design of digital media for interactive visual discovery, time series animation, and other visual analytics efforts. Various artists' and scientists' theories of color and how to apply these theories to creating your own digital media work will be reviewed.

We include a hands on session that teaches you how to build and evaluate color schemes with Adobe's Kuler, Color Scheme Designer, and Color Brewer tools, each of which are available online.

Please bring various small JPEG examples of your visualizations for doing color analyses. We will also share our own personal failures and successes with applying these color theories and tools to actual visualization projects.

Before the tutorial, please consider registering at http://kuler. adobe.com for an account to access Adobe's Kuler tool.

VisWeek 2011

22nd IEEE Visualization Conference 17th IEEE InfoVis Conference 6th IEEE VAST <u>Conference</u>

Oct. 23 - 28, 2011 Providence, RI, USA Call for Participation

VisWeek 2011 is the premier forum for advances in scientific and information visualization. The event-packed week brings together researchers and practitioners from academia, government, and industry to explore their shared interests in tools, techniques, and technology.

We invite you to participate in IEEE Visualization, IEEE Information Visualization, and IEEEVisual Analytics Science and Technology by sharing your research, insights, experience, and enthusiasm in Providence, Rhode Island. Early Deadlines: (subject to slight changes)

February 2011 Contest / Challenge sample data released

March 21, 2011 Paper Abstracts (Mandatory)

March 31, 2011 Full Paper submission

April 28, 2011 Tutorial Proposals Workshop Proposals

Rhode Island is packed with 400 miles of coastline and 20 percent of the country's historic landmarks all within an easy drive of its Capital city of Providence. The city itself boasts museums, shopping, nightlife and scores of immaculately preserved homes from the Colonial, Federal, Greek Revival and Victorian eras, throughout its easily walkable streets. With celebrated restaurants, awardwinning theatre, and a vibrant arts scene enhanced by an elaborate river-walk, Providence is the ideal setting for VisWeek 2011.

www.visweek.org

Follow @ieeevisweek to keep up with conference activities and announcements.

Questions? Email info@vgtc.org

VIsWeek 2011 General Chairs: David Laidlaw, Brown University Ross Whitaker, University of Utah VisWeek 2011 Conference Chairs: Jean-Daniel Fekete, INRIA (InfoVis) David Laidlaw, Brown University (Vis) William Pike, Pacific Northwest National Laboratory (VAST) Jonathan Roberts, Bangor University (VAST)

12:10pm - 2:00pm

O Lunch Break

2:00pm - 5:55pm

O VisWeek Tutorial Visualizing Data in R Grand Ballroom D

eun

Organizer: Hadley Wickham R is an open-source statistical programming environment. It is widely used by academic statisticians and has become increas-

ingly popular in many applied domains. In this tutorial, you'll learn about: the strengths and weaknesses of this tool that is employed in diverse fields from biology to psychology to political science; approaches to visualisation from a different tradition that embraces the command line interface and expects that users will have some programming knowledge; and how you can connect to R to take advantage of cutting edge statistical and machine learning models.

We'll begin with an brief introduction to the R language, continuing with a discussion of how you can use it with your existing tools. You'll also learn the basic data structures and some of the tools most important for fluent R use.

You'll learn how to create a wide variety of basic graphics using the R package ggplot2, and enhance them with aesthetics and facetting. You'll also learn a new strategy for dealing with large data.

2:00pm - 10:00pm

Foundations of Topological Analysis

O VisWeek Workshop

Imperial Ballroom CD

Organizers: Peer-Timo Bremer, Hans Hagen, Valerio Pascucci

Topological techniques are becoming increasingly popular in large scale data analysis. They provide the high level of abstraction necessary to deal with extremely large data. Simultaneously, their close connection to well known mathematical theories can be exploited to guarantee correctness, completeness, and strict error bounds. The interplay between fundamental theory, robust algorithms, and their impact on applications gives rise to a new subfield concerned with topology-based data analysis. This workshop will explore this rapidly growing field with a particular focus on the open challenges and recent approaches to address them.

Monday, 25 October

8:30am - 12:10pm

O VisWeek Workshop

Imperial Ballroom CD

The Role of Theory in Information Visualization Organizers: Robert Kosara, T.J. Jankun-Kelly, Chris Weaver

Information visualization is a very applied field that prides itself on its practical applications and real-world scenarios. Ignoring the theoretical side is dangerous, however, because it limits our ability to distill useful information about the foundations of the field from the practical work being done, and limits our understanding of how and why our own creations work. The goal of this workshop is to bring together researchers interested in the theoretical aspects of infovis, define the field, discuss ideas and approaches, and get the word out about the importance of theoretical research in information visualization.

8:30am - 5:55pm

O VisWeek Tutorial

DIY Vis Applications

Imperial Ballroom B

Organizers: Berk Geveci, Utkarsh Ayachit, Jeffrey Baumes, Michael Bostock, Vadim Ogievetsky, Brian Wylie, Timothy M. Shead, Emanuele Santos, Timo Ropinski, Jörg-Stefan Praßini

Every year, researchers present many new wonderful visualization and analysis algorithms. However, many of these algorithms are not transitioned to receptive researchers in a timely manner. Algorithm developers typically build lightweight prototypes to demonstrate their ideas and research to the community, and building full-featured visualization applications is hard work. This tutorial covers some of the most popular open-source frameworks whose aim is to simplify the development and deployment of visualization algorithms to high quality software applications:

- **ParaView,** an open-source turnkey application for analyzing and visualizing scientific data sets.
- Protovis, a Javascript toolkit for building Web applications.
- VTK, a very popular toolkit for building scientific visualization and informatics applications.
- Titan, extending VTK to provide analytics functionality.
- VisTrails, a scientific workflow and provenance management system.
- VisMashups, providing an easy way to deploy VisTrails workflows over the Web.
- Voreen, an interactive visualization environment.

We will focus on building desktop- and Web-based visualization applications using these open-source tools, covering a variety of application types.

8:30am - 10:10am

O VAST Welcome, VAST Keynote, Imperial Ballroom A Papers Fast Forward

VAST Keynote: How Will Big Pictures Emerge From a Sea of [...] Data?

> Speaker: Luis A. N. Amaral, Northwestern University

Every year since the article "How Will Big Pictures Emerge From a Sea of Biological Data?" appeared in Science, the question becomes more compelling. We are now accumulating information about biological sequences, structures, and interactions faster than we have the power to make sense of them. For hundreds of years prior to this, practical considerations coerced biological research into reductionism. There are simply too many components in a biological system for a biologist to examine the whole picture with the tools formerly available. Over the past decade this has rapidly changed as biological information has become cheap and plentiful due to the advent of high-throughput tools, making it possible for the first time to ask questions on time and length scales that were previously intractable. The relaxation of the practical limitations on systems-level analysis has also brought a change in the philosophy of how we regard biology, moving towards a holistic method of research and interpretation.

O SoftVis Keynote and SoftVis Welcome Grand Ballroom D SoftVis Keynote: A Pragmatic Perspective on Software Visualization Speaker: Arie van Deursen, Delft University of Technology For software visualization researchers taking the pragmatic philosophical stance, the ultimate measure of success is adoption in industry. For you as researcher, what can be more satisfying than enthusiastic developers being able to work better and more effi-

ciently thanks to your beautiful visualization of their software? One of the aims of this talk is to reflect on factors affecting impact in practice of software visualization research. How does rigorous empirical evaluation matter? What is the role of foundational research that does not subscribe to the philosophy of pragmatism? Can we make meaningful predictions of adoption

I will illustrate the dilemmas, opportunities, and frustrations

involved in trying to achieve practical impact with examples drawn from my own research in such areas as software architecture analysis, documentation generation, and Web 2.0 user interface reverse engineering. I will also shed light on some of my most recent research activities, which includes work in the area of spreadsheet comprehension.

in practice if this takes 10 years or more?



10:10am - 10:30am

O Break

10:30am - 12:10pm

O SoftVis Papers

Grand Ballroom D

New Visualization and Interaction Techniques Chair: John Stasko

SoftVis Best Paper

An Interactive Ambient Visualization for Code Smells, Emerson Murphy-Hill, Andrew P. Black

CodePad: Interactive Spaces for Maintaining Concentration in Programming Environments, Chris Parnin, Carsten Görg, Spencer Rugaber

User Evaluation of Polymetric Views Using a Large Visualization Wall, Craig Anslow, Stuart Marshall, James Noble, Ewan Tempero, Robert Biddle

Software Evolution Storylines, Michael Ogawa, Kwan-Liu Ma

10:30am - 12:30pm

O VAST Papers

Imperial Ballroom A

Visual-Computational Analysis of Multidimensional Data Chair: Ross Maciejewski DimStiller: Workflows for Dimensional Analysis and Peductio

DimStiller: Workflows for Dimensional Analysis and Reduction, Stephen Ingram, Tamara Munzner, Veronika Irvine, Melanie Tory, Steven Bergner, Torsten Möller Visual Exploration of Classification Models for Risk Assessment, M.A. Migut, M. Worring

Improving the Visual Analysis of High-dimensional Datasets Using Quality Measures, Georgia Albuquerque, Martin Eisemann, Dirk J. Lehmann, Holger Theisel, Marcus Magnor

iVisClassifier: An Interactive Visual Analytics System for Classification Based on Supervised Dimension Reduction, Jaegul Choo, Hanseung Lee, Jaeyeon Kihm, Haesun Park

Finding and Visualizing Relevant Subspaces for Clustering High-**Dimensional Astronomical Data Using Connected Morphological** Operators, Bilkis J. Ferdosi, Hugo Buddelmeijer, Scott Trager, Michael H.F. Wilkinson, Jos B.T.M. Roerdink

Flow-based Scatterplots for Sensitivity Analysis, Yu-Hsuan Chan, Carlos D. Correa, Kwan-Liu Ma

12:10pm - 2:00pm

O Lunch Break

2:00pm - 5:55pm

O VisWeek Tutorial

Imperial Ballroom CD

Large Vector-Field Visualization : Theory and Practice Organizers: Hank Childs, Christoph Garth, Bernd Hentschel, Markus Rutten, Xavier Tricoche

The study of vector fields found in science, engineering, and medicine has a rich tradition in Scientific Visualization. While vector visualization techniques have primarily focused on fluid flows, other applications are gaining prominence. Beyond the issues of depiction and perception associated with the visual investigation of large-scale and time-varying vector fields, the exploding size of numerical simulations coupled with the growing significance of Lagrangian methods raises unique challenges in data management and computational scalability. This tutorial provides an overview of modern approaches and discusses their suitability for large vector field visualization. Theory, computation, and application perspectives will be considered.

2:00pm - 3:40pm

O VAST Papers

Space, Time, and Multivariate Analytics Chair: Jo Wood

Anomaly Detection in GPS Data Based on Visual Analytics, Zicheng Liao, Yizhou Yu, Baoquan Chen

VAST Honorable Mention

Discovering Bits of Place Histories from People's Activity Traces, Gennady Andrienko, Natalia Andrienko, Martin Mladenov, Michael Mock, Christian Pölitz

A Visual Analytics Approach to Model Learning, Supriya Garg, I.V. Ramakrishnan, Klaus Mueller

Multidimensional Data Dissection Using Attribute Relationship Graphs, Chris Weaver

Visual Market Sector Analysis for Financial Time Series Data, Hartmut Ziegler, Marco Jenny, Tino Gruse, Daniel A. Keim

O SoftVis Papers

Grand Ballroom D

Imperial Ballroom A

Visualization of Memory Chair: Wim De Pauw

AllocRay: Memory Allocation Visualization for Unmanaged Languages, George G. Robertson, Trishul Chilimbi, Bongshin Lee

Doctoral Colloquium 2011

Oct. 23, 2011 • Providence, RI, USA

Call for Participation

VisWeek 2011 will host a Doctoral Colloquium to support the next generation of visualization researchers. Ph.D. students at any stage of their research are invited to apply to participate in the colloquium. Students who will be completing their proposal defense near the time of the colloquium are particularly encouraged to apply. It will incorporate contributions from the visualization, information visualization, and visual analytics student communities.

Colloquium participation will offer students insight and support for the framing of their research and will help them create important relationships. Financial support may be available to participants to assist in traveling to the conference.

The colloquium will be run as a single day invitation-only event at the beginning of IEEE VisWeek.

Questions? Email info@vgtc.org

Heapviz: Interactive Heap Visualization for Program Understanding & Debugging, Edward E. Aftandilian, Sean Kelley, Connor Gramazio, Nathan Ricci, Sara L. Su, Samuel Z. Guyer

A Map of the Heap: Revealing Design Abstractions in Runtime Structures, Colin Myers, David Duke

Trevis: A Context Tree Visualization & Analysis Framework and Its Use for Classifying Performance Failure Reports, Andrea Adamoli, Matthias Hauswirth

3:40pm - 4:15pm

O Break

4:15pm - 5:55pm

O SoftVis Papers Grand Ballroom D **Visualization for Program Comprehension and Maintenance** Chair: Stephan Diehl

Exploring the Inventor's Paradox: Applying Jigsaw to Software Visualization, Haowei Ruan, Craig Anslow, Stuart Marshall, James Noble

Dependence Cluster Visualization, Syed S. Islam, Jens Krinke, David Binkle

Towards Anomaly Comprehension: Using Structural Compression to Navigate Profiling Call-Trees, Shen Lin, François Taïani, Thomas C. Ormerod, Linden J. Ball

Embedding Spatial Software Visualization in the IDE: An **Exploratory Study**, Adrian Kuhn, David Erni, Oscar Nierstrasz

4:15pm - 6:15pm

O VAST Challenge

Imperial Ballroom A **O VAST, Interactive Demos, PhD Collog, and SoftVis Posters Fast** Forward

6:15pm - 7:15pm

O VisWeek Poster Viewing

Grand Ballroom Reception

Tuesdau, 26 October

Imperial Ballroom CD

8:30am - 12:15pm

O VisWeek Tutorial

The PhD in Visualization Starter Kit (PVSK)

Organizer: Robert S. Laramee

Writing a PhD is difficult, and those just starting a PhD in visualization have not usually acquired all of the key skills necessary for completion. For example, how does a researcher navigate through the vast amounts of previously published literature related to their topic? For some, this may be their first time implementing a larger, long-term project. Developing a large software application requires more knowledge than implementing a small one. How can bugs and problems be tracked down and eliminated in a large visualization application? And what is a good starting point when writing a research paper?

We present some of the essential skills that a PhD candidate in Visualization needs during their study including (1) reading and (2) writing research papers, and (3) implementing and (4) debugging software.

8:30am - 5:55pm

O VisWeek Workshop Telling Stories with Data

Organizers: Matt McKeon, Joan DiMicco, Karrie Karahalios

While visualization is an excellent tool for discovery and analysis, it is also a powerful medium for communication. The best information graphics do more than just present numbers: they tell a story, engage and convince their readers, invite them to make a personal connection to the data, and help them tell stories of their own. This workshop examines the construction of narratives with visualization, drawing participants with interests in visualization, social media, journalism, and the humanities. Topics may include the use of visualization in news stories, the application of narrative theory to data presentation, techniques for engaging audiences, and empowering people to tell their own stories with visualization.

8:30am - 10:10am

O VAST Papers

Text Analytics Chair: Niklas Elmqvist

Two-stage Framework for a Topology-Based Projection and

Visualization of Classified Document Collections, Patrick Oesterling, Gerik Scheuermann, Sven Teresniak, Gerhard Heyer, Steffen Koch, Thomas Ertl, Gunther H. Weber

Understanding Text Corpora with Multiple Facets, Lei Shi, Furu Wei, Shixia Liu, Li Tan, Xiaoxiao Lian, Michelle X. Zhou

VizCept: Supporting Synchronous Collaboration for Constructing Visualizations in Intelligence Analysis, Haeyong Chung, Seungwon Yang, Naveed Massjouni, Christopher Andrews, Rahul Kanna, Chris North

Diamonds in the Rough: Social Media Visual Analytics for Journalistic Inquiry, Nicholas Diakopoulos, Mor Naaman, Funda Kivran-Swaine

VAST Best Paper

Visual Readability Analysis: How to Make Your Writings Easier to Read, Daniela Oelke, David Spretke, Andreas Stoffel, Daniel A. Keim

O SoftVis Papers

Trace Visualization Chair: Andreas Kerren

Visualizing Windows System Traces, Yongzheng Wu, Roland H. C. Yap, Felix Halim

Understanding Complex Multithreaded Software Systems by Using Trace Visualization, Jonas Trümper, Johannes Bohnet, Jürgen Döllner

Zinsight: A Visual and Analytic Environment for Exploring Large Event Traces, Wim De Pauw, Steve Heisig

Jype - A Program Visualization and Programming Exercise Tool for Python, Juha Helminen, Lauri Malmi

10:10am - 10:30am

O Break

10:30am - 12:10pm

O VAST Papers Supporting Sensemaking Imperial Ballroom A

Grand Ballroom D

Chair: Chris Weaver NetClinic: Interactive Visualization to Enhance Automated Fault Diagnosis in Enterprise Networks, Zhicheng Liu, Bongshin Lee, Srikanth Kandula, Ratul Mahajan

Geo-Historical Context Support for Information Foraging and Sensemaking: Conceptual Model, Implementation, and Assessment, Brian Tomaszewski, Alan M. MacEachren

Real-time Aggregation of Wikipedia Data for Visual Analytics, Nadia Boukhelifa, Fanny Chevalier, Jean-Daniel Fekete

Click2Annotate: Automated Insight Externalization with Rich Semantics, Yang Chen, Scott Barlowe, Jing Yang

Interactive Querying of Temporal Data Using A Comic Strip Metaphor, Jing Jin, Pedro Szekely

O SoftVis Papers

Grand Ballroom D

Graph Layout and Visualization of Evolution Chair: Kwan-Liu Ma

SoftVis Best Paper

Off-Screen Visualization Techniques for Class Diagrams, Mathias Frisch, Raimund Dachselt

An Automatic Layout Algorithm for BPEL Processes, Benjamin Albrecht, Philip Effinger, Markus Held, Michael Kaufmann

Visual Comparison of Software Architectures, Fabian Beck, Stephan Diehl

Representing Development History in Software Cities, Frank Steinbrückner, Claus Lewerentz

12:10pm - 2:00pm

O Lunch Break

2:00pm - 5:55pm

O VisWeek Tutorial Tensors in Visualization Imperial Ballroom CD

Organizers: Gordon L. Kindlmann, Thomas Schultz, Xavier Tricoche, M. Alex O. Vasilescu, Anna Vilanova, Eugene Zhang

Tensor fields arise in several scientific applications, such as diffusion-weighted magnetic resonance imaging and fluid flows. Organization of data into data tensors can provide a useful mathematical tool even for processing and visualizing simple

Imperial Ballroom B

Imperial Ballroom A

scalar volume datasets. This tutorial will present a coherent and coordinated explanation of these topics with particular emphasis on topics for additional research.

The first half of the tutorial will focus on second-order tensors. An indispensable step in the visualization of tensor fields is to select a part of the data for display, in order to avoid visual clutter.

The second half will start with treating tensors of higher orders in the context of **High Angular Resolution Diffusion Imaging** (HARDI). We will describe the main threads of HARDI research and point out differences in their interpretation.

Finally, we turn to a larger class of volume datasets: Data tensors or multi-way arrays are often encountered when we have a collection of multivariate data which can be organized into a data tensor based on their causal factors.

2:00pm - 3:40pm

O VAST Papers

Imperial Ballroom A

Collaborative Analytics, Understanding Users and the Analytic Process

Chair: Jean-Daniel Fekete

A Closer Look at Note Taking in the Co-located Collaborative Visual Analytics Process, Narges Mahyar, Ali Sarvghad, Melanie Tory

VAST Honorable Mention

An Exploratory Study of Co-located Collaborative Visual Analytics Around a Tabletop Display, Petra Isenberg, Danyel Fisher, Meredith Ringel Morris, Kori Inkpen, Mary Czerwinski

Helping Users Recall Their Reasoning Process, Heather Richter Lipford, Felesia Stukes, Wenwen Dou, Matthew E. Hawkins, Remco Chang

Comparing Different Levels of Interaction Constraints for Deriving Visual Problem Isomorphs, Wenwen Dou, Caroline Ziemkiewicz, Lane Harrison, Dong Hyun Jeong, Roxanne Ryan, William Ribarsky, Xiaoyu Wang, Remco Chang

Towards the Personal Equation of Interaction: The Impact of Personality Factors on Visual Analytics Interface Interaction, Tera Marie Green, Brian Fisher

O SoftVis Demo Session

Grand Ballroom D

xDIVA: Automatic Animation Between Debugging Break Points, Yung-Pin Cheng, Han-Yi Tsai, Chih-Shun Wang, Chien-Hsin Hsueh

Understanding Relaxed Memory Consistency Through Interactive Visualization, Øystein Thorsen, Charles Wallace

Beat: A Tool for Visualizing the Execution of Object Orientated Concurrent Programs, Paul Johnson, Stephen Marsland

3:40pm - 4:15pm

O Break

4:15pm - 5:55pm

O VisWeek Panel: VAST Capstone Imperial Ballroom A The State of Visual Analytics: Views on What Visual Analytics Is and Where It Is Going

Organizer: Richard May

Panelists: Pat Hanrahan, Daniel A. Keim, Ben Shneiderman, Stuart Card

In the 2005 publication "Illuminating the Path" visual analytics was defined as "the science of analytical reasoning facilitated by interactive visual interfaces". A lot of work has been done in visual analytics over the intervening five years. While visual analytics

SoftVis Posters

Sunday 9:00 am - Thursday 8:00 pm Grand Ballroom Reception

3D Kiviat Diagrams for the Interactive Analysis of Software Metric Trends, Andreas Kerren, Ilir Jusufi

Graph Works - Pilot Graph Theory Visualization Tool, Dan Medani, Gary Haggard, Chris Bassett, Peter Koch, Nikolas Lampert, Tim Medlock, Steven Pierce, Ryan Smith, Andrew Yehl

Visualizing Software Entities Using a Matrix Layout, Dirk Zeckzer

ImpactViz: Visualizing Class Dependencies and the Impact of Changes in Software Revisions, Matthew Follett, Orland Hoeber

VIPERS: Visual Prototyping Environment for Real-Time Imaging Systems, Frederic Jean, Alexandra Branzan Albu

Towards Automated Analysis and Visualization of Distributed Software Systems, Martin Beck, Jürgen Döllner

SoftVis Best Poster: TIE: An Interactive Visualization of Thread Interleavings, Gowritharan Maheswara, Jeremy S. Bradbury, Christopher Collins

GEM: Graphical Explorer of MPI Programs, Alan Humphrey, Christopher Derrick, Ganesh Gopalakrishnan, Beth R. Tibbitts

Fault Forest Visualization, Sven Böttger, Henning Barthel, Achim Ebert

started in the United States with a focus on security, it is now a worldwide research agenda with a broad range of application domains. This is evidenced by efforts like the European VisMaster program and the upcoming Visual Analytics and Knowledge Discovery (VAKD) workshop, just to name two.

O VAST Closing

Imperial Ballroom A

O SoftVis Virtual Capstone Presentation & Closing Grand Blrm D Why Don't Developers Draw Diagrams? Speaker: Grady Booch, IBM Research

Common sense (and common practice in other engineering disciplines) tells us that modeling is a Good Thing. There is undeniable value in having and using simple, standard, and expressive graphical notations to help one reason about complex artifacts. However, while software-intensive systems are among the most complex of artifacts, reality is that the vast majority of developers live fully in the textual dimension and, like Flatlanders, have no understanding of or desire for the visual dimension save for a few diagrams with dubious semantics that they may hastily and ethereally sketch on a whiteboard. This community (of SoftVis researchers) have produced some compelling ideas – but none of them are what one can claim to be fully mainstream. This keynote will discuss why this is so and what we might do to narrow this gap to attend to the pain points of developers.

6:15pm - 7:15pm

O VisWeek Papers Fast Forward

7:15pm - 8:30pm

O Jim Thomas Wine Sip

Imperial Ballroom BCD

Grand Ballroom D

Imperial Ballroom C/D

8:30pm - 10:00pm

O VisLies:

How (Not!) to Lie and Confuse with Visualization

People have misled and been misled with statistics and maps for years (e.g., How to Lie with Statistics and How to Lie with Maps). In this community, we realize how easy it is to lie and confuse with visualization, as well, and even on purpose. This year, we continue the very popular evening event, called How (not!) to Lie and Confuse with Visualization. This is your big annual chance to show off examples, successful manipulations, pet peeves, and bugaboos.

T3



8:30am - 10:10am

O VisWeek Welcome and Keynote Imperial Ballroom ABCD VisWeek Keynote: Representations in the Mind and in the World: How Cognitive Science Can Inform the Design of Visualizations Speaker: Mary Hegarty, Professor, Department

of Psychology, University of California, Santa Barbara

In recent years, with developments in computer graphics and humancomputer interaction techniques, dynamic and interactive displays have become commonplace. New research communities in scientific visualization, information visualization and visual analytics have developed around questions



of how to best design and use these information technologies to address current challenges in fields such as medicine, emergency and critical infrastructure management, and science. It is tempting to believe that these are technical challenges that can be met by the creation of more realistic, detailed, and interactive visualizations. But cognitive science research indicates that the most effective visual representations are often sparse and simple. When given control over interactive visualizations, people do not always use these technologies effectively or choose the most effective external representations for the task at hand. Furthermore, individual differences in internal visualization ability can be more predictive of task performance than the availability of powerful external visualizations. Therefore I will argue that the design of effective visualizations is as much a challenge for cognitive science as for computer and information science, and that these disciplines must collaborate closely on the development of new information technologies and visualization design.

10:10am - 10:30am

O Break

10:30am - 12:10pm

O InfoVis Papers Applications: Geo, Bio and Time Chair: Danyel Fisher

Imperial Ballroom CD

InfoVis Honorable Mention

Necklace Maps, Bettina Speckmann, Kevin Verbeek

Rethinking Map Legends with Visualization, Jason Dykes, Jo Wood, Aidan Slingsby

SignalLens: Focus+Context Applied to Electronic Time Series, **Robert Kincaid**

MulteeSum: A Tool for Comparative Spatial and Temporal Gene Expression Data, Miriah Meyer, Tamara Munzner, Angela DePace, Hanspeter Pfister

Gremlin: An Interactive Visualization Model for Analyzing Genomic Rearrangements, Trevor M. O'Brien, Anna M. Ritz, Benjamin J. Raphael, David H. Laidlaw

O Vis Papers

Imperial Ballroom A

Theoretical Foundations of Visualization Chair: Daniel Weiskopf

On the Fractal Dimension of Isosurfaces, Marc Khoury, Rephael Wenger

An Information-theoretic Framework for Visualization, Min Chen, Heike Jänicke

An Information-Theoretic Framework for Flow Visualization, Lijie Xu, Teng-Yok Lee, Han-Wei Shen

Vis Best Paper

Streak Lines as Tangent Curves of a Derived Vector Field, Tino Weinkauf, Holger Theisel

O Vis Papers

Imperial Ballroom B

Cameras and Images Chair: Shigeo Takahashi

A Curved Ray Camera for Handling Occlusions through Continuous Multiperspective Visualization, Jian Cui, Paul Rosen, Voicu Popescu, Christoph Hoffmann

Special Relativistic Visualization by Local Ray Tracing, Thomas Müller, Sebastian Grottel, Daniel Weiskopf

Computing Robustness and Persistence for Images, Paul Bendich, Herbert Edelsbrunner, Michael Kerber

Browsing Large Image Datasets through Voronoi Diagrams, Paolo Brivio, Marco Tarini, Paolo Cignoni

12:10pm - 2:00pm

O Lunch Break

2:00pm - 3:40pm

O InfoVis Papers Evaluation

Chair: Petra Isenberg

Imperial Ballroom CD

Graphical Perception of Multiple Time Series, Waqas Javed, Bryan McDonnel, Niklas Elmqvist

Uncovering Strengths and Weaknesses of Radial Visualizations-An Empirical Approach, Stephan Diehl, Fabian Beck, Michael Burch

How Information Visualization Novices Construct Visualizations, Lars Grammel, Melanie Tory, Margaret-Anne Storey

Evaluating the Impact of Task Demands and Block Resolution on the Effectiveness of Pixel-based Visualization, Rita Borgo, Karl Proctor, Min Chen, Heike Jänicke, Tavi Murray, Ian M. Thornton

O Vis Papers

Imperial Ballroom A

Visual Mappings

Chair: Joachim Giesen

Visual Exploration of High Dimensional Scalar Functions, Samuel Gerber, Peer-Timo Bremer, Valerio Pascucci, Ross Whitaker

Two-Phase Mapping for Projecting Massive Data Sets, Fernando V. Paulovich, Cláudio T. Silva, L. Gustavo Nonato

Discontinuities in Continuous Scatterplots, Dirk J. Lehmann, Holger Theisel

eSeeTrack-Visualizing Sequential Fixation Patterns, Hoi Ying Tsang, Melanie Tory, Colin Swindells

Spatial Conditioning of Transfer Functions Using Local Material Distributions, Stefan Lindholm, Patric Ljung, Claes Lundström, Anders Persson, Anders Ynnerman

O Vis Papers

Imperial Ballroom B

Illustrative Methods Chair: Tobias Isenberg

Exploded View Diagrams of Mathematical Surfaces, Olga Karpenko, Wilmot Li, Niloy J. Mitra, Maneesh Agrawala

IRIS: Illustrative Rendering of Integral Surfaces, Mathias Hummel, Christoph Garth, Bernd Hamann, Hans Hagen, Kenneth I. Joy

Vis Honorable Mention

Illustrative Stream Surfaces, Silvia Born, Alexander Wiebel, Jan Friedrich, Gerik Scheuermann, Dirk Bartz

Exploration of 4D MRI Blood-Flow Using Stylistic Visualization, Roy van Pelt, Javier Oliván Bescós, Marcel Breeuwer, Rachel E. Clough, M. Eduard Gröller, Bart ter Haar Romeny, Anna Vilanova

3:40pm - 4:15pm

OBreak

4:15pm - 5:55pm

O VisWeek Panel

Imperial Ballroom CD

Challenges in Visualizing Biological Data Organizers: Nils Gehlenborg, Carsten Görg, Miriah Meyer, Cydney

Nielsen Panelists: Inna Dubchak, Matthew Hibbs, Seán O'Donoghue, Chris North

The overall goal of this panel is to start a dialogue between the visualization community and the biology/bioinformatics community. The goal is to inform the visualization audience of challenges from both sides and encourage a discussion for how these communities can collaborate more extensively. Ultimately we hope to connect people between communities and to promote interaction between them. To that end, this panel is one part of a larger, more ambitious agenda.

O Vis Contest

Imperial Ballroom AB

O Discovery Exhibit

O Posters and Vis In Other Venues Fast Forward

6:00pm - 7:00pm

O Poster Viewing

Grand Ballroom Reception

7:00pm - 9:00pm

O VisWeek Banquet

Grand Ballroom B



VAST Posters

Sunday 9:00 am - Thursday 8:00 pm Grand Ballroom Reception

Dynamic Time Transformation for Interpreting Clusters of Trajectories with Space-Time Cube, Gennady Andrienko, Natalia Andrienko

Interactive Visual Analysis of Multiobjective Optimizations, Wolfgang Berger, Harald Piringer

Cluster Correspondence Views for Enhanced Analysis of SOM Displays, Jürgen Bernard, Tatiana von Landesberger, Sebastian Bremm, Tobias Schreck

Visualization of Temporal Relationships within Coordinated Views, Stephanie Dudzic, J. Alex Godwin, Ryan M. Kilgore

Conveying Network Features in Geospatial Battlespace Displays, J. Alex Godwin, Ryan M. Kilgore

ALIDA: Using Machine Learning for Intent Discernment in Visual Analytics Interfaces, Tera Marie Green, Ross Maciejewski, Steve DiPaola

Enhancing Text-Based Chat With Visuals For Hazardous Weather Decision Making, Moshe Gutman, Gina Eosco, Monica Zappa, Chris Weaver

Visual Analysis of Frequent Patterns In Large Time Series, M.C. Hao, M. Marwah, H. Janetzko, D.A. Keim, U. Dayal, R. Sharma, D. Patnaik, N. Ramakrishnan

Visually Representing Geo-Temporal Differences, Orland Hoeber, Garnett Wilson, Simon Harding, René Enguehard, Rodolphe Devillers

A Continuous Analysis Process Between Desktop and Collaborative Visual Analytics Environments, Dong Hyun Jeong, Evan Suma, Thomas Butkiewicz, William Ribarsky, Remco Chang

EmailTime: Visual Analytics of Emails, Minoo Erfani Joorabchi, Ji-Dong Yim, Christopher D. Shaw

Enron Case Study: Analysis of Email Behavior using EmailTime, Minoo Erfani Joorabchi, Ji-Dong Yim, Mona Erfani Joorabchi, Christopher D. Shaw

Large-scale Neuroanatomical Visualization Using a Manifold Embedding Approach, Shantanu H. Joshi, Ian Bowman, John Darrell Van Horn

Combining Statistical Independence Testing, Visual Attribute Selection and Automated Analysis to Find Relevant Attributes for Classification, Thorsten May, James Davey, Jörn Kohlhammer

Visual Tools for Dynamic Analysis of Complex Situations, Marielle Mokhtari, Eric Boivin, Denis Laurendeau, Maxime Girardin

Data Representation and Exploration with Geometric Wavelets, Eric E. Monson, Guangliang Chen, Rachael Brady, Mauro Maggioni

Translating Cross-Filtered Queries into Questions, Maryam Nafari, Chris Weaver

ProDV — A Case Study in Delivering Visual Analytics, Derek Overby, John Keyser, Jim Wall

A Visual Analytics Approach to Identifying Protein Structural Constraints, William C. Ray

VAST Best Poster: A Radial Visualization Tool for Depicting Hierarchically Structured Video Content, Tobias Ruppert, Jörn Kohlhammer

Adapting Daniel and Wood's Modeling Approach to Interactive Visual Analytics, Justin Talbot, Pat Hanrahan

Thursday, 28 October

Imperial Ballroom CD

8:30am - 10:10am

O InfoVis Papers **Perception and Cognition Chair: Chris North**

InfoVis Best Paper

Graphical Inference for Infovis, Hadley Wickham, Dianne Cook, Heike Hofmann, Andreas Buja

Matching Visual Saliency to Confidence in Plots of Uncertain Data, David Feng, Lester Kwock, Yueh Lee, Russell M. Taylor II

InfoVis Honorable Mention

Perceptual Guidelines for Creating Rectangular Treemaps, Nicholas Kong, Jeffrey Heer, Maneesh Agrawala

Mental Models, Visual Reasoning and Interaction in Information Visualization: A Top-down Perspective, Zhicheng Liu, John T. Stasko

Laws of Attraction: From Perceived Forces to Conceptual Similarity, Caroline Ziemkiewicz, Robert Kosara

O Vis Papers Imperial Ballroom A **Registration, Segmentation, and Denoising of Medical Data** Chair: Jos Roerdink

Supine and Prone Colon Registration Using Quasi-Conformal Mapping, Wei Zeng, Joseph Marino, Krishna Chaitanya Gurijala, Xianfeng Gu, Arie Kaufman

Uncertainty-Aware Guided Volume Segmentation, Jörg-Stefan Praßni, Timo Ropinski, Klaus Hinrichs

Exploration and Visualization of Segmentation Uncertainty Using Shape and Appearance Prior Information, Ahmed Saad, Ghassan Hamarneh, Torsten Möller

Edge Aware Anisotropic Diffusion for 3D Scalar Data, Zahid Hossain, Torsten Möller

O Vis Papers

Imperial Ballroom B **Visual Analysis and Design in Scientific Applications**

Chair: Patricia Crossno

Scalable Multi-variate Analytics of Seismic and Satellite-based Observational Data, Xiaoru Yuan, He Xiao, Hanqi Guo, Peihong Guo, Wesley Kendall, Jian Huang, Yongxian Zhang

Noodles: A Tool for Visualization of Numerical Weather Model Ensemble Uncertainty, Jibonananda Sanyal, Song Zhang, Jamie Dyer, Andrew Mercer, Philip Amburn, Robert J. Moorhead

Analysis of Recurrent Patterns in Toroidal Magnetic Fields, Allen R. Sanderson, Guoning Chen, Xavier Tricoche, David Pugmire, Scott Kruger, Joshua Breslau

Interactive Visualization of Hyperspectral Images of Historical Documents, Seon Joo Kim, Shaojie Zhuo, Fanbo Deng, Chi-Wing Fu, Michael S. Brown

10:10am - 10:30am

OBreak

10:30am - 12:10pm

O InfoVis Papers

Multi-dimensional Visualization Chair: Niklas Elmqvist

Imperial Ballroom CD

Pargnostics: Screen-Space Metrics for Parallel Coordinates, Aritra Dasgupta, Robert Kosara

Comparative Analysis of Multidimensional, Quantitative Data, Alexander Lex, Marc Streit, Christian Partl, Karl Kashofer, Dieter Schmalstieg

An Extension of Wilkinson's Algorithm for Positioning Tick Labels on Axes, Justin Talbot, Sharon Lin, Pat Hanrahan

Stacking Graphic Elements to Avoid Over-plotting, Tuan Nhon Dang, Leland Wilkinson, Anushka Anand

Visualization of Diversity in Large Multivariate Data Sets, Tuan Pham, Rob Hess, Crystal Ju, Eugene Zhang, Ronald Metoyer

O Vis Papers

Imperial Ballroom A

Biomedical Visualization Chair: Bernhard Preim

Interactive Histology of Large-Scale Biomedical Image Stacks, Won-Ki Jeong, Jens Schneider, Stephen G. Turney, Beverly E. Faulkner-Jones, Dominik Meyer, Rüdiger Westermann, R. Clay Reid, Jeff Lichtman, Hanspeter Pfister

Articulated Planar Reformation for Change Visualization in Small Animal Imaging, P. Kok, M. Baiker, E.A. Hendriks, F.H. Post, J. Dijkstra, C.W.G.M. Löwik, B.P.F. Lelieveldt, C.P. Botha

Volumetric Modeling in Laser BPH Therapy Simulation, Nan Zhang, Xiangmin Zhou, Yunhe Shen, Robert Sweet

O VisWeek Panel

Imperial Ballroom B

Using Visualization for Storytelling on the Web Organizers: Fernanda B. Viégas, Jock Mackinlay Panelists: Sarah Cohen, Al Melchior, Tom Crawford

This panel will give examples of how interactive visualization is already being used on the web to support effective storytelling. The goal is to identify areas for further research. We will consider both the authors and their readers. What requirements do authors have for creating visualizations? Do readers interact with visualizations? Are there particular design patterns that are effective?

12:10pm - 2:00pm

O Lunch Break

12:30pm - 1:30pm

O VisWeek Feedback Session

2:00pm - 3:40pm

O InfoVis Papers Graph Visualization Chair: Adam Perer

Imperial Ballroom CD

Imperial Ballroom CD

PedVis: A Structured, Space-Efficient Technique for Pedigree Visualization, Claurissa Tuttle, Luis Gustavo Nonato, Cláudio T. Silva

GeneaQuilts: A System for Exploring Large Genealogies, Anastasia Bezerianos, Pierre Dragicevic, Jean-Daniel Fekete, Juhee Bae, **Ben Watson**

Visualization of Graph Products, Stefan Jänicke, Christian Heine, Marc Hellmuth, Peter F. Stadler, Gerik Scheuermann

Untangling Euler Diagrams, Nathalie Henry Riche, Tim Dwyer

The FlowVizMenu and Parallel Scatterplot Matrix: Hybrid Multidimensional Visualizations for Network Exploration, Christophe Viau, Michael J. McGuffin, Yves Chiricota, Igor Jurisica

Visualization in Other Venues

Sunday 9:00 am - Thursday 8:00 pm Grand Ballroom Reception SciVis in other venues: What's going on in EuroVis 2010, Curated by Carlos Correa

SciVis in other venues: What's going on in PacificVis 2010, Curated by Xiaoru Yuan

SciVis in other venues: What's going on in APGV 2010, Curated by Alark Joshi

InfoVis in other venues: What's going on in CHI 2010, Curated by Heidi Lam

InfoVis in other venues: What's going on in CSCW 2010, Curated by Petra Isenberg

InfoVis in other venues: What's going on in blogosphere 2010, Curated by Andrew Vande Moere

InfoVis in other venues: What's going on in Graph Drawing 2010, Curated by Tim Dwyer

InfoVis in other venues: What's going on in UIST 2010, Curated by Jeff Heer

InfoVis in other venues: What's going on in BELIV 2010, Curated by Enrico Bertini

Interactive Demos

Sunday 9:00am-Thursday 8:00pm Grand Ballroom Reception

Heapviz: A Programmer's Tool for Data Structure Visualization, Edward E. Aftandilian, Sean Kelley, Connor Gramazio, Nathan Ricci, Sara L. Su, Samuel Z. Guyer

Interactive Demo: Using CZSaw to Analyze Entities in Collections, Victor Chen, Dustin Dunsmuir, Nazanin Kadivar, Eric Lee, Jeffrey Guenther, Saba Alimadadi Jani, John Dill, Chris Shaw, Robert Woodbury, Maureen Stone, Cheryl Qian

Interactive Demo: Visually Analyzing Text Collections with Multiple Facets, Weihong Qian, Furu Wei, Yangqiu Song, Li Tan, Qiang Zhang, Xiaoxiao Lian, Lei Shi, Shixia Liu, Shimei Pan, Michelle X. Zhou

Inside VisWeek 2010, Brian Staats

Interactive Demo: Stay in Touch with InfoVis - Visualizing Document Collections with Document Cards, Hendrik Strobelt, Mathias Heilig, Oliver Deussen

Visualization by Proxy: A Novel Framework for Deferred Interaction with Volume Data, Anna Tikhonova, Carlos D. Correa, Kwan-Liu Ma

O VisWeek Panel

Imperial Ballroom B Perspectives on Teaching Data Visualization

Panelists: Jason Dykes, Daniel F. Keefe, Gordon Kindlmann, Tamara Munzner, Alark Joshi

We propose to present our perspectives on teaching data visualization to a variety of audiences. The panelists will address issues related to increasing student engagement with class material, ways of dealing with heavy reading load, tailoring course material based on the audience and incorporating an interdisciplinary approach in the course.

Developing and teaching truly interdisciplinary data visualization courses can be challenging. Panelists will present their experiences regarding courses that were successful and address finer issues related to designing assignments for an interdisciplinary class, textbooks, collaboration-based final projects.

6:30pm - 8:30pm

O Scientific Computing and Imaging (SCI) Institute Open House (Buses depart Hotel at 6:15pm)

Please join us in the new Warnock Engineering Building at the University of Utah for an overview of SCI Institute research and light refreshments. See insert for more details.

O Vis Papers

Accurate Volume Rendering Chair: Jens Krüger

Pre-Integrated Volume Rendering with Non-Linear Gradient Interpolation, Amel Guetat, Alexandre Ancel, Stephane Marchesin, Jean-Michel Dischler

Gradient Estimation Revitalized, Usman Alim, Torsten Möller, Laurent Condat

Direct Interval Volume Visualization, Marco Ament, Daniel Weiskopf, Hamish Carr

VDVR: Verifiable Visualization of Projection-Based Data, Zivi Zheng, Wei Xu, Klaus Mueller

O Vis Papers

Imperial Ballroom B

Imperial Ballroom A

Navigating Parameter Spaces Chair: Huamin Ou

Interactive Visual Analysis of Multiple Simulation Runs using the Simulation Model View: Understanding and Tuning of an Electronic Unit Injector, Krešimir Matković, Denis Gračanin, Mario Jelović, Andreas Ammer, Alan Lež, Helwig Hauser

Vis Honorable Mention

World Lines, Jürgen Waser, Raphael Fuchs, Hrvoje Ribičić, Benjamin Schindler, Günther Blöschl, M. Eduard Gröller

Result-Driven Exploration of Simulation Parameter Spaces for Visual Effects Design, Stefan Bruckner, Torsten Möller

Visual Optimality and Stability Analysis of 3DCT Scan Positions, Artem Amirkhanov, Christoph Heinzl, Michael Reiter, M. Eduard Gröller

3:40pm - 4:15pm

OBreak

4:15pm - 5:55pm

O Salute to Jacques Bertin

Imperial Ballroom CD

Imperial Ballroom A

O InfoVis Papers

Social Applications Chair: Fernanda B. Viégas

OpinionSeer: Interactive Visualization of Hotel Customer Feedback, Yingcai Wu, Furu Wei, Shixia Liu, Norman Au, Weiwei Cui, Hong Zhou, Huamin Qu

The Streams of Our Lives: Visualizing Listening Histories in Context, Dominikus Baur, Frederik Seiffert, Michael Sedlmair, Sebastian Boring

A Visual Backchannel for Large-Scale Events, Marian Dörk, Daniel Gruen, Carey Williamson, Sheelagh Carpendale

Narrative Visualization: Telling Stories with Data, Edward Segel, Jeffrey Heer

O Vis Papers

Fast Volume Rendering

Chair: Christof Rezk-Salama

Fast High-Quality Volume Ray-Casting with Virtual Samplings, Byeonghun Lee, Jihye Yun, Jinwook Seo, Byonghyo Shim, Yeong-Gil Shin, Bohyoung Kim

Efficient High-Quality Volume Rendering of SPH Data, Roland Fraedrich, Stefan Auer, Rüdiger Westermann

Fast, Memory-Efficient Cell Location in Unstructured Grids for Visualization, Christoph Garth, Kenneth I. Joy

Friday, 29 October

8:30am - 10:40am

Imperial Ballroom CD

Frameworks Chair: Chris Weaver

O InfoVis Papers

InfoVis Honorable Mention

Declarative Language Design for Interactive Visualization, Jeffrey Heer, Michael Bostock

Visualizations Everywhere: A Multiplatform Infrastructure for Linked Visualizations, Danyel Fisher, Steven M. Drucker, Roland Fernandez, Scott Ruble

behaviorism: A Framework for Dynamic Data Visualization, Angus Graeme Forbes, Tobias Höllerer, George Legradya

Text Visualization

Chair: Christopher Collins

FacetAtlas: Multifaceted Visualization for Rich Text Corpora, Nan Cao, Jimeng Sun, Yu-Ru Lin, David Gotz, Shixia Liu, Huamin Qu

SparkClouds: Visualizing Trends in Tag Clouds, Bongshin Lee, Nathalie Henry Riche, Amy K. Karlson, Sheelagh Carpendale

ManiWordle: Providing Flexible Control over Wordle, Kyle Koh, Bongshin Lee, Bohyoung Kim, Jinwook Seo

O Vis Papers

Imperial Ballroom A

Vector and Tensor Data Chair: Ming Jiang

Interactive Vector Field Feature Identification, Joel Daniels II, Erik W. Anderson, Luis Gustavo Nonato, Cláudio T. Silva

Interactive Separating Streak Surfaces, Florian Ferstl, Kai Bürger, Holger Theisel, Rüdiger Westermann

View-Dependent Streamlines for 3D Vector Fields, Stéphane Marchesin, Cheng-Kai Chen, Chris Ho, Kwan-Liu Ma

Visualizing Flow Trajectories Using Locality-based Rendering and Warpes Curve Plots, Chad Jones, Kwan-Liu Ma

Superquadric Glyphs for Symmetric Second-Order Tensors, Thomas Schultz, Gordon L. Kindlmann

O Vis Papers

Imperial Ballroom B (Multi-) User Interfaces and Projection Systems

Chair: Anders Ynnerman

TanGeoMS: Tangible Geospatial Modeling System, Laura G. Tateosian, Helena Mitasova, Brendan A. Harmon, Brent Fogleman, Katherine Weaver, Russel S. Harmon

FI3D: Direct-Touch Interaction for the Exploration of 3D Scientific Visualization Spaces, Lingyun Yu, Pjotr Svetachov, Petra Isenberg, Maarten H. Everts, Tobias Isenberg

A Scalable Distributed Paradigm for Multi-User Interaction with Tiled Rear Projection Display Walls, Pablo Roman, Maxim Lazarov, Aditi Majumder

Projector Projector Placement Planning for High Quality Visualizations on Real-World Colored Objects, Alvin J. Law, Daniel G. Aliaga, Aditi Majumder

O VisWeek Panel

Grand Salon

Visualization Theory: Putting the Pieces Together Organizers: Caroline Ziemkiewicz, Peter Kinnaird Panelists: Robert Kosara, Jock Mackinlay, Bernice Rogowitz, Ji Soo Yi

Theory is an increasingly hot topic in visualization, expanding from its traditional origins in low-level perception and statistics to an ever-broader array of fields and subfields. Modern visualization theory includes color theory, visual cognition, visual grammars, interaction theory, visual analytics, information theory, and a growing but so far vaguely defined area of theory specific to visualization itself. In this panel, we bring together researchers who are studying visualization theory from these numerous different perspectives and ask how these disparate topics can combine and comment on one another to create a more unified body of theory and answer pressing research questions.

10:40am - 11:00am

O Break

11:00am - 1:00pm

O VisWeek Closing, VisWeek Capstone Imperial Ballroom BCD VisWeek Capstone: Amdahl's Laws and Extreme Data Intensive Computing

Speaker: Alex Szalay, Alumni Centennial Professor, Department of Physics and Astronomy, The Johns Hopkins University

Scientific computing is increasingly revolving around massive amounts of data. From physical sciences to numerical simulations to high throughput genomics and homeland security, we are soon dealing with Petabytes if not Exabytes of data. This new, datacentric computing requires a new look at computing architectures and strategies. I will revisit Amdahl's Law establishing the relation between CPU and I/O in a balanced computer system, and use this to analyze current computing architectures and workloads. I will discuss how existing hardware can be used to build systems that are much closer to an ideal Amdahl machine. Scaling existing architectures to the yearly doubling of data will soon require excessive amounts of electrical power. I will explore how lowpower processors combined with GPGPUs might provide an ideal, low-power platform with both excellent IO and computational performance. I have deployed various scientific test cases, mostly

drawn from astronomy, over different architectures and compare performance and scaling laws. I discuss a hypothetical cheap, yet high performance multipetabyte system currently under consideration at JHU. I will also explore strategies of interacting with very large amounts of data, and compare various large scale data analysis platforms.

Vis Posters

Sunday 8:00 am - Thursday 8:00 pm Grand Ballroom Reception Collaborative Visualization of Structural Biology, Aaron Bryden, Yoram Griguer, Tom Grim, Jordan Moxon, Michael Gleicher

Spectral Modeling of Divergence-Free Vector Fields, Fan Chen, Ye Zhao, Zhi Yuan

Aesthetics and Understanding in Molecular Motion, Shareef M. Dabdoub, William C. Ray

An Interactive, Visual Composite Tuner for Multi-layer Spatial Data Sets, Jonathan W. Decker, Mark A. Livingston

Multi-Dimensional Transfer Function Design based on Combined Interface of Parallel Coordinates and Dimension Projection, Hanqi Guo, Peihong Guo, He Xiao, Xiaoru Yuan

Tensor Visualization in Computational Turbulent Combustion: A Case Study, Md. A. Haque, A. Maries, S. Levent Yilmaz, Mehdi B. Nik, G. Elisabeta Marai

Vis Best Poster: Exploring Brain Connectivity with Two-dimensional Neural Maps, Radu Jianu, Çağatay Demiralp, David H. Laidlaw

A High-Quality Sampling Technique of PBVR for Unstructured Hexahedral Mesh Data, Takuma Kawamura, Koji Koyamada, Naohisa Sakamoto, Satoshi Tanaka

GPU-based Dynamic Tubular Grids for Sparse Volume Rendering, David Mayerich, John Keyser

Real-Time Visualizations of Ocean Data Collected By The NORUS Glider, Daniel Medina, Zoë J. Wood

GPU-Based Interactive Pixel-Exact Cut-Surface Extraction From High-Order Finite Element Fields, Blake Nelson, Bob Haimes, Robert M. Kirby

Asynchronous View-Dependent Data Retrieval for Interactive Out-of-Core Terrain Visualization, Derek Overby, John Keyser, Jim Wall

3D Curve-Skeleton Extraction Using a Skeleton-Growing Algorithm, Natapon Pantuwong, Masanori Sugimoto

Street Light View: Enriching Navigable Panoramic Street View Maps with Informative Illumination Thumbnails, Charles Rojo, Wei Xu, Klaus Mueller

Visualizing Differences of DTI Fiber Models Using 2D Normalized Embeddings, Guizhen Wang, Haidong Chen, Xiaoyong Yang, Shuang Ye, Guangyu Chen, Wei Chen, Song Zhang

Nested Refinement Domains for Tetrahedral and Diamond Hierarchies, Kenneth Weiss, Leila De Floriani

Hierarchical Streamline Bundles for Visualizing 2D Flow Fields, Hongfeng Yu, Chaoli Wang, Ching-Kuang Shene, Jacqueline H. Chen

InfoVis Posters

Sunday 8:00 am - Thursday 8:00 pm Grand Ballroom Reception

Poster: Perceptual Principles for Scalable Sequence Alignment Visualization, Danielle Albers, Michael Gleicher

Poster: Visual Analysis of Stream Texts with Keywords Significance, Jamal Alsakran, Ye Zhao, Dongning Luo, Jing Yang

Poster: Visualizing Converging Business Ecosystems for Competitive Intelligence, Rahul Basole, Mengdie Hu, Pritesh Patel, John Stasko

Poster: Using Orthographic Projection and Animation to Convey Treemap Structure, Jordan Riley Benson, Lee Sullivan, Rajiv Ramarajan, Frank Wimmer, Paul Hankey

Poster: Rapid Pen-Centric Authoring of Improvisational Visualizations with NapkinVis, William O. Chao, Tamara Munzner, Michiel van de Panne

Poster: Understanding Tagged Text, Michael A. Correll, Michael Gleicher

Poster: Multimedia Information Browsing and Visualization, Joel Dumoulin, Maria Sokhn, Elena Mugellini, Omar Abou Khaled

Poster: Design and Evaluation of an Interactive Curriculum Visualization System, Paul Gestwicki, Austin Toombs

Poster: Choosel — Web-based Visualization Construction and Coordination for Information Visualization Novices, Lars Grammel, Margaret-Anne Storey

Poster: QR VIS: Turning Printed Infographics into Interactive Visualizations, Jonathan Haber, Sheelagh Carpendale

Poster: Visualizing Protein Interaction Networks as Google Maps, Radu Jianu, David H. Laidlaw

Poster: InfoVis Best Poster: A Visual Survey of Tree Visualization, Susanne Jürgensmann, Hans-Jörg Schulz

Poster: Interactive Navigation in Interconnected Biochemical Pathways, Ilir Jusufi, Christian Klukas, Andreas Kerren, Falk Schreiber

Poster: Indirect Multi-Touch Interaction for Brushing in Parallel Coordinates, Robert Kosara

Poster: Using Non-Photorealistic Rendering Techniques for the Visualization of Uncertainty, Martin Luboschik, Axel Radloff, Heidrun Schumann

Poster: More is More, Enriched Graphs to Aid Navigation, Colin Myers, David Duke

Poster: Scattering and Jittering: Using Real and Illusionary Motion for Better Visual Scatterplot Analysis, Albert Pritzkau, Axel Radloff, Heidrun Schumann, Dirk Bartz

Poster: Visualizing Residential Resource Use: A Framework for Design, Johnny Rodgers, Lyn Bartram

Poster: Dynamic Network Visualization in 1.5D, Lei Shi, Chen Wang, Zhen Wen

Poster: Tweeting Visualizations for Collaborative Visual Analysis, Aidan Slingsby, Jason Dykes, Jo Wood

Poster: Towards Making InfoVis Views Tangible, Martin Spindler, Christian Tominski, Heidrun Schumann, Raimund Dachselt

Poster: Application of Treemaps to Business Statistics Analysis, Martijn Tennekes, Edwin de Jonge

Poster: A Taxonomy of Visual Representations and Analytic Tasks for Design of Text Visualization, Jian Zhang, Chaomei Chen, Don Pellegrino

Discovery Exhibition

Sunday 8:00 am - Thursday 8:00 pm Grand Ballroom Reception

The Use of Real Data in Fine Arts for Insight and Discovery: Case Studies in Text Analysis, Fanny Chevalier, Sara Diamond

Exploration of aircraft trails by Air Traffic Experts, Christophe Hurter, Stéphane Conversy

Use cases of Impure, an information interface, Santiago Ortiz, Victor Pascual Cid

Clinical Impact of the Tumor Therapy Manager, Bernhard Preim, Jana Dornheim, Lars Dornheim, Andreas Boehm

Using Spatial Treemaps in Local Authority Decision Making and Reporting, Robert Radburn, Roger Beecham, Jason Dykes, Jo Wood, Aidan Slingsby

Trail Explorer: Understanding User Experience in Webpage Flows, Zeqian Shen, Neel Sundaresan

Best Discovery Exhibit: Making Hurricane Track Data Accessible, Aidan Slingsby, Jane Strachan, Pier-Luigi Vidale, Jason Dykes, Jo Wood

Best Student Entry: Improving Airplane Safety: Tableau and Bird Strikes, Andrew Wade, Roger Nicholson

Temporal Pattern Discovery Using Lifelines2, Taowei David Wang, Catherine Plaisant, Ben Shneiderman

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