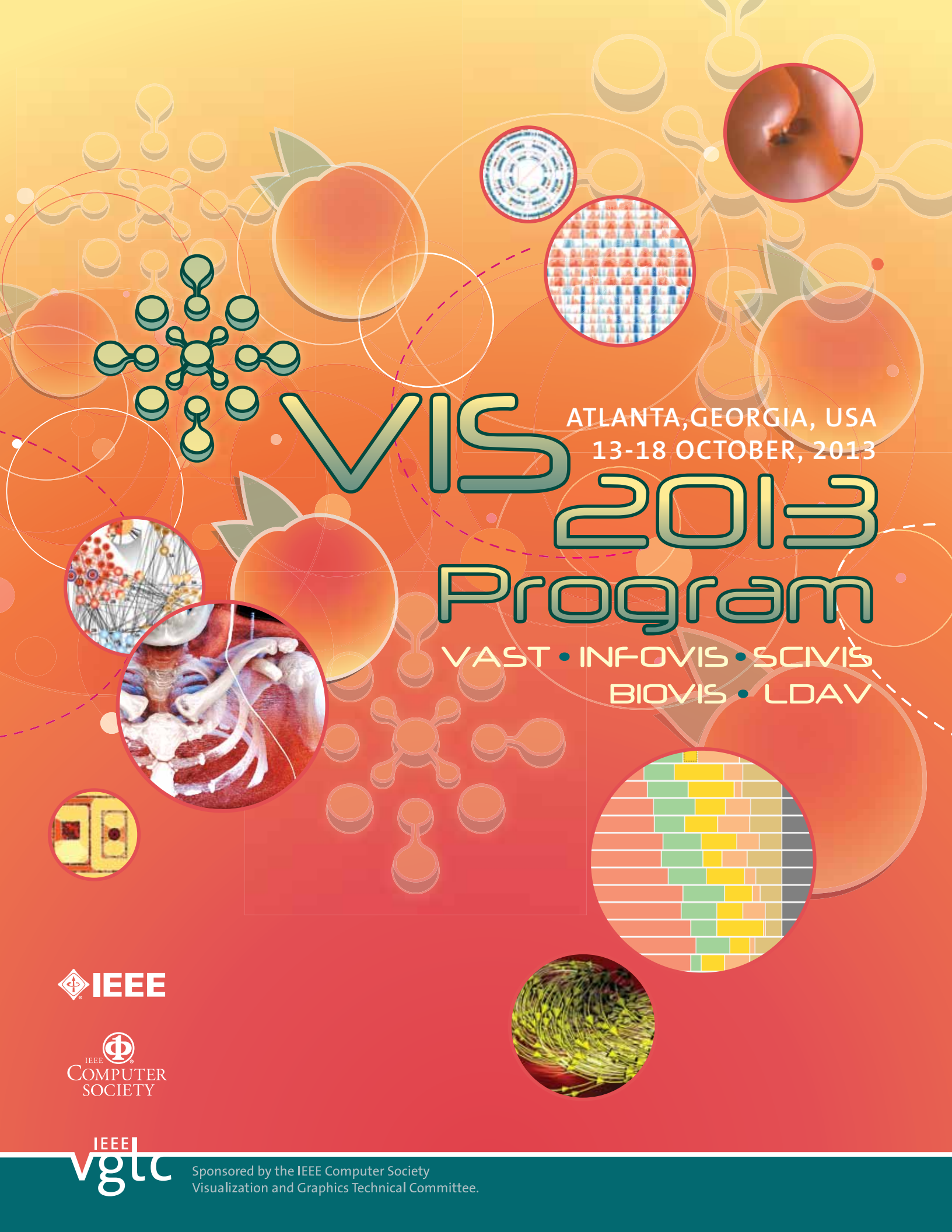
VIS 2013
Program
ATLANTA, GEORGIA, USA
13-18 OCTOBER, 2013
VAST • INFOVIS • SCIVIS
BIOVIS • LDAV
IEEE
IEEE COMPUTER SOCIETY
IEEE vgtc
Sponsored by the IEEE Computer Society
Visualization and Graphics Technical Committee.

Welcome

Welcome to VIS 2013 in Atlanta! We have adopted a new name for our meeting – the VIS acronym represents the three main conferences appearing this week: IEEE Visual Analytics Science and Technology (VAST), IEEE Information Visualization (InfoVis), and IEEE Scientific Visualization (SciVis). All of the conferences now run single track in parallel from Tuesday to Friday. Additionally, VIS is again hosting two symposia on Sunday and Monday, the IEEE Symposium on Biological Data Visualization (BioVis) and the IEEE Symposium on Large-Scale Data Analysis and Visualization (LDAV), as well as a number of workshops and tutorials. Scattered throughout the week also are an art show, doctoral colloquium, and a series of panels, posters, Meetups (birds-of-a-feather -BOF) meetings, and exhibitions. A new industry and government experiences track also has been added and may be of special interest to practitioners. It definitely promises to be an exciting and stimulating week!

We continue the recent tradition in which topical papers published during the last year in IEEE *Transactions on Visualization and Computer Graphics* (*TVCG*) constitute four of the technical paper sessions. We are proud to announce that this year for the first time *TVCG* will publish all of the papers from VAST, InfoVis, and SciVis in a special issue of the journal.

This year we have expanded the number of tracks on Sunday and Monday to bring even more workshops and tutorials to the meeting. Sunday night includes a reception for attendees of these tracks showcasing posters from the two symposia. The opening session for the three conferences on Tuesday will feature keynote speaker Erez Lieberman Aiden; the closing session on Friday features capstone speaker Jarke van Wijk. Each conference day begins via a fast-forward session containing a brief 30-second preview of every paper to be presented during that day.

As always, a number of other events will enrich the week. Posters from all of the conferences will be on display, with their own fast-forward in the late afternoon Wednesday session just before a special poster viewing and the evening VIS reception. The numerous breaks, various Compass lunch events, and evenings in the lobby will provide many further opportunities for social and collaborative interaction as well.

Welcome to Atlanta, thank you for coming, and have a great VIS!

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Chris Weaver, *(InfoVis) University of Oklahoma*
Rachael Brady, *(SciVis) Cisco Systems*
Jessie Kennedy, *(BioVis) Edinburgh Napier University*
Jos Roerdink, *(BioVis) University of Groningen*
David Rogers, *(LDAV) Sandia National Laboratory*
Claudio Silva, *(LDAV) New York University*
VIS 2013 Conference & Symposia Chairs

TOC

How to Order Proceedings

Additional copies of the VAST, InfoVis, and SciVis 2013 CD proceedings can be ordered from:

IEEE Computer Society
By mail: 10662 Los Vaqueros Circle, Los Alamitos, CA 90720
By phone: +1-800-CS-BOOKS, +1-714-821-8380 (direct)
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By web: http://www.computer.org/cms/Computer.org/Publications/OrderForms/tvcg1.pdf

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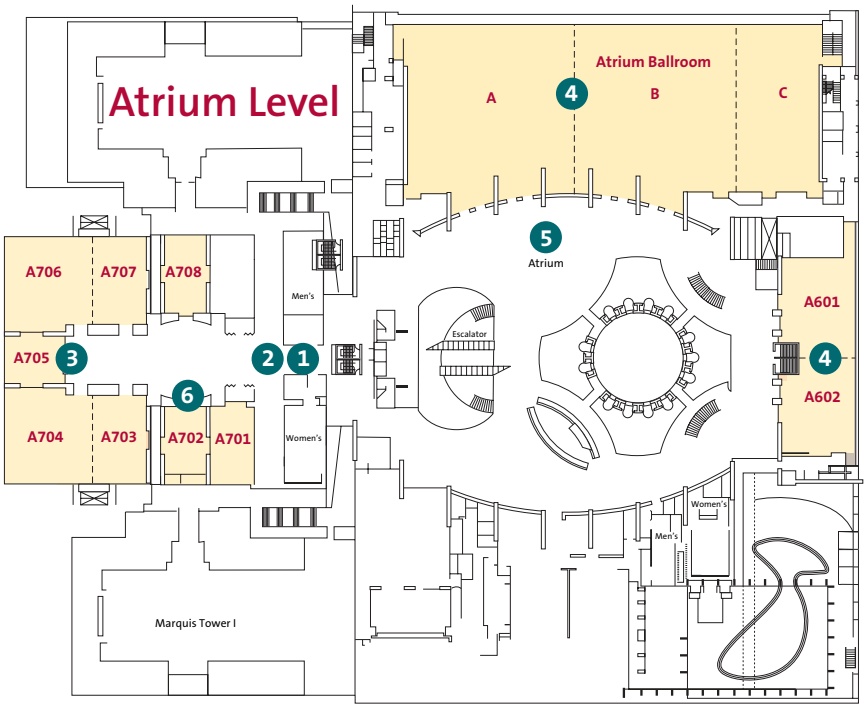
For information on awards, national initiatives, conferences and symposia, and a comprehensive membership directory, please visit **http://vgtc.org/**.

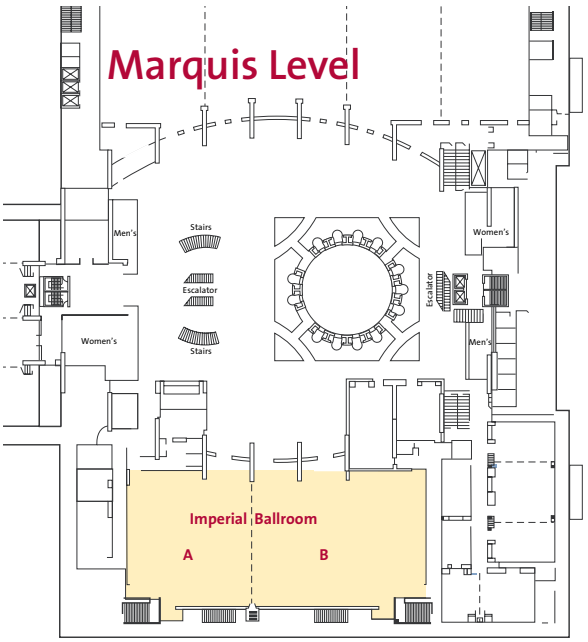
Atlanta, GA

IEEE VIS 2013 comes to the city of Atlanta, Georgia, the heart and high-tech center of the American south. Home to CNN and Coca-Cola, the spectacular Georgia Aquarium, and Centennial Olympic Park, Atlanta is an exceptionally easy to reach national and international airline hub. Visitors can discover the city's history from the Civil War to the Civil Rights Movement and experience a thriving cultural scene at the city's many theatres, museums, galleries, and family attractions.

Photo by Chuck Koehler

The Atlanta Marriott Marquis





1 Conference Registration

Located in Registration Area
Saturday, 6pm - 8pm
Sunday, 7am - 4:30pm
Monday - Thursday, 7:30am - 4:30pm
Friday, 7:30am - 10:30am

2 Meetups (BOF) Board

Check the board for times and locations, or to arrange a new Meetup. All attendees are welcome. Located next to Registration.

3 Art Program

Located in A705
Tuesday - Thursday, 8am - 5:55pm
Hosted Viewing, Wednesday, 6pm - 7pm

4 Posters

Symposia: BioVis & LDAV
BioVis Hosted Viewing, Sunday, 5pm - 8pm
LDAV Hosted Viewing, Sunday, 6pm - 8pm
@ 10th Floor Reception Area
Monday, 8:30am - 5:55pm
@ Atrium Ballroom A & B

VIS
Located in A601+A602
Tuesday - Thursday, 8am - 5:55pm
Posters FF, Wednesday, 4:15pm - 5:55pm
@ Atrium Ballroom
Hosted Viewing, Wednesday, 6pm - 7pm
@ A601+A602

5 Exhibits

Located in Atrium Lobby
Tuesday - Thursday, 10am - 6pm

6 Speaker Preparation

Located in A702
Sunday - Thursday, 7:30am - 5pm
Friday, 7:30am - 9am

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Symposia Posters

BioVis Posters

Hosted Poster Viewings — *10th Floor Reception Area*
Sunday 5pm - 8pm

Poster Viewings — *Atrium Ballroom A*
Monday 8:30am - 5:55pm

Co2Vis: A visual analytics tool for mining co-expressed and co-regulated genes implied in HIV infections, *Amal Zine El Aabidine, Arnaud Sallaberry, Sandra Bringay, Mickael Fabregue, Charles Lecellier, Phan Nhat Hai, Pascal Poncelet*

A High-Throughput Cell Analysis System to Determine Chromosome Territory Boundaries and Spatial Organization, *Alex Ade, Dilworth David, Ari Allyn-Feuer, Brian Athey*

Focus+Context Visualization for Computational Biology Expression Atlases, *Juan Castillo, Jesse Farek, Audrey Musselman-Brown, Swapnik Shah, Fiona McCarthy, Jianxia Xue, T.J. Jankun-Kelly*

Segmentation of 3D cell tomography at cellular resolution, *Chia-Kai Chang, Chien-Chung Tsai, Yu-Ta Wang, Ming-Yi Lin, Jeng-Wei Tjiu, Sheng-Lung Huang*

A cell culture online data analysis tool combining data from multiple experiments and databases, *Robin Gruver, Ryan Hamilton, Joseph George, John Boyd*

zTree: Interactive 3D Visualization of Combinatorial DNA Libraries, *Cassandra Hoef, Daniel Worstell, Orit Shaer*

Visual Comparison and Investigation of Cancer Data using a Deterministic Graph Layout, *Richard Kreisberg, Ryan Bressler, Sheila Reynolds, Brady Bernard, Ilya Shmulevich*

SAVoR: Annotation and Visualization of RNA structures, *Fan Li, Paul Ryvkin, Micah Childress, Otto Valladares, Brian Gregory, Li-San Wang*

Importance Driven Visualization of Molecular Surfaces, *Julius Parulek, Timo Ropinski, Ivan Viola*

Visualizing Microbial Ecology Data for Public and Scientific Audiences, *Megan Pirrung, Carsten Goerg*

ProfileGrids Visualize Protein Mutation Distributions, *Alberto Roca*

Visual analysis of zygotic and early embryonic transcripts, *Ryo Sakai, Ligia Mateiu, Thierry Voet, Jan Aerts*

Evaluation of Helium: Visualization of Large Scale Plant Pedigrees, *Paul Shaw, Jessie Kennedy, Martin Graham, Iain Milne, David Marshall*

Glom: Image Segmentation for Glomerular Counting, *Keith Sheppard, Susan Sheehan, Mei Xiao, Ron Korstanje*

ProContactVisio: Visualizing Protein Intramolecular Contacts, *Sabrina Silveira, Valdete Gonçalves-Almeida, Raquel Melo-Minardi, Wagner Meira Jr.*

NetGestalt: integrating multidimensional omics data over biological networks, *Jing Wang, Zhiao Shi, Bing Zhang*

A Journaling System for Rule-Based Biochemical Models, *John Wenskovitch, Leonard Harris, James Faeder, G. Elisabeta Marai*

LDAV Posters

Hosted Poster Viewings — *10th Floor Reception Area*
Sunday 6pm - 8pm

Poster Viewings — *Atrium Ballroom B*
Monday 8:30am - 5:55pm

Filtering Edge for Exploration of Large Graphs, *Xiaodi Huang*

Interactive Rendering and Efficient Querying for Large Multivariate Seismic Volumes on Consumer Level PCs, *Liang Zhou, Charles Hansen*

Chiffchaff: Observability and Analytics to Achieve High Availability, *Winston Lee, Arun Kejariwal, Bryce Yan*

Proper Orthogonal Decomposition Based Parallel Compression for Visualizing Big Data on the K Computer, *Chongke Bi, Kenji Ono, Kwan-Liu Ma, Haiyuan Wu, Toshiyuki Imamura*

Visual Analysis on Online Display Advertising Data, *Ling Huang*

Efficient Range Distribution Query in Large-scale Scientific Data, *Abon Chaudhuri, Teng-Yok Lee, Han-Wei Shen, Tom Peterka*

Comparative Case Study Between D3 & Highcharts on Lustre Metadata Visualization, *Omar ElTayeby, Dwayne John, Pragnesh Patel, Scott Simmerman*

An Interactive Method for Activity Detection Visualization, *Li Liu, Sedat Ozer, Karen Bemis, Jay Takle, Deborah Silver*

Visualization of Multivariate Dark Matter Halos in Cosmology Simulations, *Jay Takle, Deborah Silver, Eve Kovacs, Katrin Heitmann*

Visualization of Residents in Long-Term Care Centres through Mobile Natural User Interfaces (NUI), *Bhuvaneswari Arunachalan, Sara Diamond, Anne Stevens, Borzu Talaie, Maziar Ghaderi*

VIS 2013

Sunday

	VIS EVENTS	BioVis (Atrium Blm A)	LDAV (Atrium Blm B)
8:00			
8:30	Tut: Flow Field Analysis & Vis. @ A601+A602	Welcome & Keynote	
9:00	WS: Public Health's Wicked Problems: Can InfoVis Save Lives? @ Imperial A		
9:30	Tut: Grooming the Hairball @ A703+A704		
10:00	Tut: Vis of Data as Visual Interp. of Data@A706+A707	BREAK	
10:30	WS: VAST Challenge @ Imperial B	Papers: Visualizing Sequece & Omics Data	
11:00			
11:30			
12:00		LUNCH BREAK	
1:00			
2:00	Tut: Visualization & Analytics in Python @ A601+A602	Papers: Visualizing Cellular & Molecular Data	Opening & Keynote
2:30	Tut: User-Centered Evaluation in Vis. @ A703+A704		
3:00	Tut: Interactive Visual Analy. of Sci. Data @ A706+A707		
3:30		BREAK	BREAK
4:00		Poster FF	Papers: Dealing with Graphs & Particles
4:30			
5:00		Poster Session @ 10th Fl. Reception Area	
5:30			Pstr FF
6:00	Symposium Poster Session & Reception @ 10th Floor Reception Area		
6:30			
7:00			
8:00			
9:00			

Monday

	VIS EVENTS	BioVis (Atrium Blm A)	LDAV (Atrium Blm B)
8:00			
8:30	Symposia Posters	Papers: Visualizing Networks & Interactions	FF
9:00	WS: The 3rd Workshop on Interactive Visual Text Analytics @ Imperial A		Papers: Exploiting Parallelism
9:30	Tut: Vis: A Modern Perspective @ A703+A704		
10:00	WS: VizSec @ Imperial B	BREAK	BREAK
10:30	Tut: Mobile & Cloud Web-Based Graphics & Vis @A706+A707	Papers: Visualizing Population & Function	Papers: Leveraging App. & System Characteristics
11:00	WS: VAPLS @ A601+A602		
11:30			
12:00		LUNCH BREAK	
1:00			
2:00	Tut: Video Visualization @ A703+A704	Contest: Data Contest Redesign Contest	Papers: Foundational Tech. for Lrg. & Complex Data
2:30	WS: Sports Data Visualization @ A601+A602		
3:00			
3:30		BREAK	BREAK
4:00		Challenges Session Awards & Closing	Prev. Session cont) Awards & Closing
4:30			
5:00			
5:30			

Tuesday

	VIS	VAST (A703+A704)	InfoVis (Atrium Blm A)	SciVis (Atrium Blm B)
8:00	VIS Posters (08:00-18:00) @ A601+A602	VIS Welcome VIS Keynote Speaker: Erez Lieberman Aiden (08:00-10:00) @Atrium Ballroom A & B		
8:30				
9:00				
9:30				
10:00		VIS Paper FF (10:00-10:30)		
10:30		BREAK		
11:00				
11:30	Exhibits (10:00-18:00) @ Atrium Lobby	Papers: Modeling & Decision Making	Papers: Ordinal & Categorical Data	Papers: Vol & Surface Modeling
12:00		LUNCH BREAK Compass: Talk Research		
1:00				
2:00		Papers: Text & Social Media	Papers: Perception & Cognition	Papers: Uncertainty & multivariate analysis
2:30				
3:00				
3:30		BREAK		
4:00				
4:30		Panel: Evaluation: How Much Evaluation is Enough?	Papers: Defining the Design Space	TVCG: Scientific Visualization I
5:00				
5:30				
6:00	Meet the Candidate @ A601+ A602			
6:30				
7:00				
8:00				
9:00				

Industry and Goverment Highlighted Tracks

At-a-Glance

Wednesday

VIS EVENTS	VAST (A703+A704)	InfoVis (Atrium Blm A)	SciVis (Atrium Blm B)
VIS Posters (08:00-18:00) @ A601+A602	VIS Papers Fast Forward		
	WS: Using Visual Analytics to Foster Lateral Thinking About Business Problems @ A706 + A707	Papers: High-Dimensional Data	Papers: Story-telling & Presentation	Papers: Vector & flow visualization
	BREAK		
	Papers: Images & Video	Papers: Systems & Sets	Papers: Navigation, interaction, & evaluation
	LUNCH BREAK		
	Compass: Talk Career		
Exhibits (10:00-18:00) @ Atrium Lobby	Arts Program Papers @ A706+ A707	Panel: The Role of Visualization in the Big Data era	TVCG: Scitific Visualization II
	BREAK		
	Posters FF @Atrium Ballroom A & B		
Vis Posters + Art Program (6:00pm-7:00pm) @ A601+A602+A705			
VIS Banquet @ Atrium Ballroom ABC			

Thursday

VIS EVENTS	VAST (A703+A704)	InfoVis (Atrium Blm A)	SciVis (Atrium Blm B)
VIS Posters (08:00-18:00) @ A601+A602	VIS Papers Fast Forward		
	WS: Mobile & Breaking News: New Challenges for News Information Visualizations @ A706 + A707	TVCG: Visual Analytics		Papers: Biomedical Visualization
	BREAK		
	Papers: Space & Movement	Papers: Application Areas	Papers: Visualization Systems
	LUNCH BREAK		
Exhibits (10:00-18:00) @ Atrium Lobby	VAST Special Session	Papers: Time, Trees & Graphs	
	BREAK		
	Papers: Sense-making & Collaboration	TVCG: Information Visualization	Panel: Challenges for Scientific Visualization Software

Friday

VAST (A703+A704)	InfoVis (Atrium Blm A)	SciVis (Atrium Blm B)
VIS Papers Fast Forward		
Papers: Temporal Analytics	Papers: High-Dimensional Data	Papers: Volume Rendering SciVis Contest
BREAK		
VIS Closing VIS Capstone Speaker: Jarke van Wijk (10:30-12:30) @Atrium Ballroom A		

8:00 8:30 9:00 9:30 10:00 10:30 11:00 11:30 12:00 1:00 2:00 2:30 3:00 3:30 4:00 4:30 5:00 5:30 6:00 6:30 7:00 8:00 9:00

Industry and Goverment Highlighted Tracks

VIS 2013
Program Details

Sunday, 13 October

Full Day

Workshop (8:30am - 5:55pm) *Imperial A*

Public Health's Wicked Problems: Can InfoVis Save Lives?

Contributors: Susan J. Robinson (Georgia Institute of Technology), Marty Cetron (Centers for Disease Control and Prevention), Hazel Dean (Centers for Disease Control and Prevention), Bradford Hesse (National Cancer Institute, NIH), John Stasko (Georgia Institute of Technology), Ben Shneiderman (University of Maryland), David S. Ebert (Purdue University)

The goal of the workshop is to bring together world-class public health and information visualization experts and curious learners to discuss how the fields can come together to generate new tools for emerging and longstanding public health problems. Public health is charged with assessing current and emerging health threats and issues, developing effective population-based policies and interventions to address these problems, and monitoring delivery and outcomes of public health actions. Many public health problems, such as the obesity epidemic, HIV/STI transmission, and environmental hazards are called "wicked" due to their complexity and multi-layered causal factors at individual, group, and social levels (Kreuter, 2004). To make decisions about when and where to deploy resources that produce the greatest net benefits in complex or rapidly evolving situations, public health practitioners need new tools to integrate multiple sources of data from formal disease surveillance systems, secondary sources of geographic and demographic data, and new data streams such as real-time social media content. We invite original research, case studies/practice reports, systematic reviews, evaluation studies, methodology innovations, or commentary on the following topics of specific interest, while welcoming work on all aspects of public health and information visualization.

VAST Workshop (8:30am - 5:55pm) *Imperial B*

VAST Challenge

Contributors: Kristin Cook (Pacific Northwest National Laboratory), Georges Grinstein (University of Massachusetts, Lowell), Mark Whiting (Pacific Northwest National Laboratory)

At this workshop that recaps the 2013 VAST Challenge, challenge organizers, participants, and conference attendees come together to discuss their work on this year's Challenge. The workshop will feature sessions dedicated to each of the three mini-challenges. All of the 2013 honorees will present their winning submissions. In addition, the meeting will feature a poster session, a participant feedback session, and a look forward to the 2014 competition. This workshop is open to all IEEE VIS attendees.

Half day

Tutorial (8:30am - 12:10pm) *A703+A704*

Grooming the Hairball. How to Tidy up Network Visualizations?

Contributors: Hans-Joerg Schulz (University of Rostock, Germany), Christophe Hurter (ENAC/University of Toulouse, France)

Every visualization researcher and practitioner knows the painful experience of a beautifully designed network layout breaking down once the input graph scales up to realistic node and edge counts. The resulting "hairball" suffers from cluttering and over-plotting to an extreme that renders it unusable for any practical purposes. Since researchers have had this experience for decades, various approaches have been developed on all stages of the visualization pipeline to alleviate this problem. They range from filtering and clustering techniques on the data level to modern GPU-based techniques on the image level. This tutorial gives an overview of these techniques and discusses their applicability and interplay in different application scenarios. By doing so, it provides a unique problem-oriented perspective on the field of scalable network visualization, which is an area of active research today more than ever. The tutorial serves mainly to further the understanding of network visualization beyond the point of creating an initial layout. It thus caters to an intermediate level audience with some basic knowledge on graph layout and visualization, but it will certainly present an interesting cross-section through the larger domains of network visualization and graph drawing for established researchers as well.

Tutorial (8:30am - 12:10pm) *A706+A707*

Visualization of Data as Visual Interpretation of Data. Hands-on Design Tutorial

Contributor: Marek Kultys (Independent Design Professional)

To provide accurate, comprehensive picture of data is a cardinal virtue of good practice in visual information design. "Graphical excellence begins with telling the truth about the data" (Tufte). Yet, still too often it poses difficulties to visualization makers. Usually, it is merely due to one's unawareness or lack of understanding of basic design rules that help maintain high graphical integrity. Therefore, familiarizing oneself to the practical rules of truthful, unambiguous data presentation remains in best interest of both the authors, as well as the viewers of data visualizations.

In this interdisciplinary hands-on tutorial the students will learn the basics of good visual design practice necessary to create clear, coherent, unequivocal and impactful visualizations. Through a series of lectures and case study demonstrations the students will learn the rules of graphical integrity, become familiar with most common visualization traps and understand the gravity of data visualization accuracy. Following this primer, the students will engage in a hands-on sketching activity, in which they will explore and exercise various ways of controlling and

distorting the meaning of data by manipulating its visual presentation. Equipped with this valuable first-hand knowledge of the mechanisms of visual design misrepresentation, the students will become able to make informed and better design decisions in their own visualization work. In the concluding group critique the students will also learn to critically judge the accuracy and performance of the visualizations made by themselves, as well as by their peers.

This tutorial continues and expands on the VIS tutorial "Good Practice of Visual Communication Design..." which was very positively received at the 2012 conference in Seattle, WA. Digital handouts and presentation synopsis will be provided to all tutorial participants.

Tutorial (8:30am - 12:10pm) *A601+A602*
State-of-the-Art Flow Field Analysis and Visualization
Contributors: Chaoli Wang (Michigan Technological University), Han-Wei Shen (The Ohio State University), Daniel Weiskopf (University of Stuttgart), Tom Peterka (Argonne National Laboratory), Guoning Chen (University of Houston)

Flow visualization is a central topic in scientific visualization and has been a focused research area for many years. New challenges have arrived as the size and complexity of flow field data continue to grow at astonishing rates. For instance, how to strike a balance between complexity and clarity when visualizing large and complex 3D flow fields? how to design scalable solutions for line integral convolution and particle tracing? and how to detect flow recurrent dynamics via topology study? Traditional flow visualization solutions were not specifically designed to tackle big data in mind and as such, those algorithms and techniques need to be reexamined or new solutions need to be proposed to handle large-scale flow fields.

In an effort to survey recent progress in addressing the above set of diverse challenges, our tutorial covers the following topics: (i) streamlines in 3D: techniques beyond seed placement; (ii) texture-based flow visualization; (iii) graph-based analysis of large scale flow fields; (iv) foundations of data-parallel particle advection; and (v) vector field topology in flow analysis and visualization. The goal of this tutorial is to inform visualization researchers and practitioners the state-of-the-art technologies that have greatly enriched the toolset for analyzing and visualizing large-scale flow field data sets.

Tutorial (2:00pm - 5:55pm) *A703+A704*
Scientific Evaluation in Visualization
Contributors: Camilla Forsell (Linköping University), Matthew Cooper (Linköping University)

The objective of this half-day introductory tutorial is to increase awareness of what constitutes a sound scientific approach to evaluation in Visualization and to provide basic theoretical knowledge of, and practical skills in, current research practice of usability and evaluation. The content presents the current challenges and trends related to how to characterize and optimize the complex interactive visual displays present in Visualization today. It will cover the most basic and relevant issues to consider during different phases of evaluation: planning, design, execution, analysis of results and reporting. The content outlines how to proceed to achieve high quality results and point out common pitfalls and mistakes which are threats to high quality results. Taking part in this tutorial will not train a novice participant to be fully capable of designing and conducting an evaluation study and analyzing its outcome, such a goal would require a substantially larger course. The aim is to introduce the topic, provide general knowledge about what is important to consider and what resources are available to guide them in further study in this area. Further, participants will also learn to better judge the relevance and quality of a publication presenting an evaluation when reviewing such work since the same rules apply.

Tutorial (2:00pm - 5:55pm) *A706+A707*
Interactive Visual Analysis of Scientific Data
Contributors: Steffen Oeltze (University of Magdeburg, Germany), Johannes Kehrer (Vienna University of Technology, Austria), Helwig Hauser (University of Bergen, Norway)

In a growing number of application areas, a subject or phenomenon is investigated by means of multiple datasets being acquired over time (spatiotemporal), comprising several attributes per data point (multi-variate), stemming from different data sources (multi-modal) or multiple simulation runs (multi-run/ensemble) [KH13]. Interactive visual analysis (IVA) comprises concepts and techniques for a user-guided knowledge discovery in such complex data. Through a tight feedback loop of computation, visualization and user interaction, it provides new insight into the data and serves as a vehicle for hypotheses generation or validation. It is often implemented via a multiple coordinated view framework where each view is equipped with interactive drill-down operations for focusing on data features. Two classes of views are integrated: physical views, such as direct volume rendering, show information in the context of the spatiotemporal observation space while attribute views, such as scatter plots and parallel coordinates, show relationships between multiple data attributes. The user may drill-down the data by selecting interesting regions of the observation space or attribute ranges leading to a consistent highlighting of this selection in all other views (brushing-and-linking). Three patterns of explorative/analytical procedures may be accomplished by doing so. In a feature localization, the user searches for places in the 3D/4D observation space where certain attribute values are present. In a multi-variate analysis, relations between data attributes are investigated, e.g., by searching for correlations. In a local investigation, the user inspects the values of selected attributes with respect to certain spatiotemporal subsets of the observation space.

In this tutorial, we discuss examples for successful applications of IVA to scientific data from various fields: climate research, medicine, epidemiology, and flow simulation / computation, in particular for automotive engineering. We base our discussions on a theoretical foundation of IVA which helps the tutorial attendees in transferring the subject matter to their own data and application area. In the course of the tutorial, the attendees will become acquainted with techniques from statistics and knowledge discovery, which proved to be particularly useful for a specific IVA application. The tutorial further comprises an overview of off-the-shelf IVA solutions, which may be particularly interesting for visualization practitioners. It is concluded by a summary of the gained knowledge and a discussion of open problems in IVA of scientific data.

Tutorial (2:00pm - 5:55pm) *A601+A602*
Visualization and Analytics in Python
Contributors: Peter Wang (Continuum Analytics), Travis Oliphant (Continuum Analytics), Joseph Cottam (Indiana University)

This tutorial will introduce the participant to Python tools for data analysis and visualization. The tools covered include NumPy, Numba, Blaze, Pandas, Bokeh and Matplotlib. These tools cover the whole data analysis pipeline, with data ingestion (Blaze, NumPy), manipulation (Numba, NumPy, Pandas), visualization (Bokeh and Matplotlib) and publish to a web-service (Bokeh). A brief introduction to the Python language itself will also be included (though some python experience is strongly suggested). By the end of this workshop, a participant can expect to be able to load a large dataset, do basic analysis and construct web-enabled interactive visualizations.

BioVis Symposium

8:30am - 10:10am

BioVis Welcome *Atrium Ballroom A*

BioVis Keynote: Scientific Publishing in a Technological Age

Speaker: Daniel Evanko, *Chief Editor, Nature Methods*

The scientific publishing landscape is changing rapidly and publishers, authors and readers are working hard to adapt. Advances in research technologies are generating increasing amounts of data that require commensurate advances in accessibility, analysis and visualization. Although digital technologies provide possible solutions to allow publishers to fully participate in this revolution and add new capabilities, it has proven challenging to adapt the traditional publishing model to take full advantage of new opportunities. I will discuss these challenges and opportunities and what publishers are doing to meet them from the point of view of a chief editor at Nature Publishing Group. Particular emphasis will be given to data handling and visualization, the role of computer scientists and the challenges in bridging the distinct biology and computer science cultures.

10:10am - 10:30am

Coffee Break

10:30am - 12:00pm

BioVis Papers *Atrium Ballroom A*

Visualizing Sequence and Omics Data

Chair: Alexander Lex

Primer Talk: Sequence and Omics Data, Cydney Nielsen

invis: Exploring High-dimensional Sequence Space of In Vitro Selection, Cagatay Demiralp, Eric Hayden, Jeff Hammerbacher, Jeffrey Heer

Large-Scale Multiple Sequence Alignment Visualization through Gradient Vector Flow Analysis, Khoa Tan Nguyen, Timo Ropinski

COMBat: Visualizing co-occurrence of annotation terms, Remko van Brakel, Mark Fiers, Christof Francke, Michel Westenberg, Huub van de Wetering

12:00pm - 2:00pm

Lunch Break

2:00pm - 3:40pm

BioVis Papers *Atrium Ballroom A*

Visualizing Cellular and Molecular Data

Chair: Jan Aerts

Primer Talk: Cellular and Molecular Data, Tom Ferrin

Robust Detection and Visualization of Cytoskeletal Structures in Fibrillar Scaffolds from 3-Dimensional Confocal Images, Do Young Park, Desiree Jones, Nicanor I. Moldovan, Raghu Machiraju, Thierry Pecot

PresentaBALL - a Powerful Package for Presentations and Lessons in Structural Biology, Stefan Nickels, Daniel Stackel, Sabine C. Mueller, Hans-Peter Lenhof, Andreas Hildebrandt, Anna Katharina Dehof

From Biochemical Reaction Networks to 3D Dynamics in the Cell: the ZigCell3D Modeling, Simulation and Visualization Framework, Ciechomski de Heras, Pablo Stanislaw, Klann Michael, Mange Robin, Koeppl Heinz

The Molecular Control Toolkit: controlling 3D molecular graphics via gesture and voice, Kenneth Sabir, Christian Stolte, Bruce Tabor, Sean O'Donoghue

3:40pm - 4:15pm

Coffee Break

4:15pm - 5:00pm

BioVis Poster Fast Forward *Atrium Ballroom A*

5:00pm - 6:00pm

BioVis Poster Session *10th Floor Reception Area*

Chairs: Cydney Nielsen and Robert Kincaid

LDAV Symposium

2:00pm - 3:45pm

LDAV Welcome *Atrium Ballroom B*

LDAV Keynote: Visualizing and Modeling Ranked Data

Speaker: Guy Lebanon, *Amazon, Georgia Institute of Technology*

Guy Lebanon is a senior manager at Amazon, where he leads the Machine Learning Science Group. Prior to that he was a tenured professor at the Georgia Institute of Technology and a scientist at Google and Yahoo. His main research areas are statistical machine learning, computational statistics, and information visualization. Guy received his PhD in 2005 from Carnegie Mellon University and BA, and MS degrees from Technion - Israel Institute of Technology. Dr. Lebanon has authored over 60 refereed publications. He is an action editor of Journal of Machine Learning Research, was the program chair of the 2012 ACM CIKM Conference, and will be the conference co-chair of AI & Statistics (AISTATS 2015). He received the NSF CAREER Award, the ICML best paper runner-up award, the Yahoo Faculty Research and Engagement Award, and is a Siebel Scholar.

3:45pm - 4:15pm

Coffee Break

4:15pm - 5:45pm

LDAV Papers *Atrium Ballroom B*

Interacting with Large-Scale Graphs and Particles

Distributed Parallel Particle Advection using Work Requesting, Cornelius Müller, David Camp, Bernd Hentschel, Christoph Garth

A Scalable Algorithm for Single-Linkage Hierarchical Clustering on Distributed-Memory Architectures, William Hendrix, Diana Palsetia, Md. Mostofa Ali Patwary, Ankit Agrawal, Wei-keng Liao, Alok Choudhary

Graph-based Seed Scheduling for Out-of-core FTLE and Pathline Computation, Chun-Ming Chen, Han-Wei Shen

5:45pm - 6:00pm

LDAV Posters Fast Forward *Atrium Ballroom B*

6:00pm - 8:00pm

Symposia Poster Session & Reception *10th Flr. Reception Area*

Monday, 14 October

Full Day

Tutorial (8:30am - 5:55pm) *A706+A707*

Mobile and cloud Web-based graphics and visualization

Contributors: Haim Levkowitz (University of Massachusetts Lowell)

A full-day, intermediate-level tutorial covering the up-and-coming topics of "Mobile and Cloud Web-Based Graphics and Visualization." The complete rationale and justification for this tutorial is given in the Introduction section below. The organization of the tutorial is provided in the Tentative Topics section, following the Introduction. Finally, a short biography of the instructor is provided.

Workshop (8:30am - 5:55pm) *Imperial A*

The 3rd Workshop on Interactive Visual Text Analytics

Contributors: Christopher Collins (University of Ontario Institute of Technology), Eser Kandogan (IBM Almaden Research Center), Shixia Liu (Microsoft Research Asia), Michelle X. Zhou (IBM Almaden Research Center), Chad Steed (Oak Ridge National Laboratory)

Much research has been reported on visual text analytics for plain text documents viewed in traditional analytic settings. In this workshop, we would like to push the boundary of visual text analytics toward heterogeneous textual data (text associated with other data types) and ubiquitous text analytics. First, we would like to use the workshop to collect various use cases about heterogeneous data and ubiquitous text analytics. From the use cases, we hope to better understand the requirements of heterogeneous textual data analysis from a task-driven perspective. Second, based on the use cases, we would like to use this workshop to examine how to best leverage state-of-the-art text analytics and traditional data mining techniques in conjunction with novel interactive visual analytics to address the challenges manifested by the collected use cases.

Workshop (8:30am - 5:55pm) *Imperial B*

10th Visualization for Cyber Security (VizSec)

Chairs: [General Chair] John Goodall (Oak Ridge National Laboratory), [Program Chair] Kwan-Liu Ma (University of California, Davis), [Publications / Publicity Chair] Sophie Engle (University of San Francisco), [Poster Chair] Fabian Fischer (Universität Konstanz)

The 10th Visualization for Cyber Security (VizSec) is a forum that brings together researchers and practitioners from academia, government, and industry to address the needs of the cyber security community through new and insightful visualization and analysis techniques. VizSec will provide an excellent venue for fostering greater exchange and new collaborations on a broad range of security- and privacy-related topics.

Important research problems often lie at the intersection of disparate domains. Our focus is to explore effective, scalable visual interfaces for security domains, where visualization may provide a distinct benefit, including computer forensics, reverse engineering, insider threat detection, cryptography, privacy, preventing 'user assisted' attacks, compliance management, wireless security, secure coding, and penetration testing in addition to traditional network security. Human time and attention are precious resources. We are particularly interested in visualization and interaction techniques that effectively capture human analyst insights so that further processing may be handled by machines, freeing the analyst for other tasks. For example, a malware analyst might use a visualization system to analyze a new piece of malicious software and then facilitate generating a signature for future machine processing. When appropriate, research that incorporates multiple data sources, such as network packet captures, firewall rule sets and logs, DNS logs, web server logs, and/or intrusion detection system logs, is particularly desirable.

Half Day

Tutorial (8:30am - 2:00pm) *A703+A704*

Visualization: A Modern Perspective

Contributor: Georges Grinstein (University of Massachusetts Lowell)

This tutorial will provide a modern view of visualization and provide the necessary background to understand the issues in the development and usage of visualization and visual analytics systems. We will provide a brief history and overview of data visualization, of analysis, of their integration, and of the role of reasoning, all from a modern viewpoint. We will examine systems that integrate visualization and analysis and explore what a system in 2020 would look like. Many slides, videotapes and demonstrations will be provided.

Workshop (8:30am - 2:00pm) *A601+A602*

VAPLS 2013 Workshop on Visualization and Analysis of Performance on Large-scale Software

Contributors: Peer-Timo Bremer (Lawrence Livermore National Laboratory), Joshua A. Levine (Clemson University), Paul Rosen (University of Utah), Martin Schulz (Lawrence Livermore National Laboratory)

The hardware complexity of HPC systems has increased in parallel with the complexity of modern simulation and scale-bridging applications. Consequently, writing efficient software for these large- scale systems has become increasingly difficult. Understanding the interactions of hardware and software and their impacts on scalability in the presence of large numbers of compute cores is essential for optimizing HPC systems. However, in many cases it is simply too difficult to comprehend performance characteristics. The purpose of this workshop is to cross-pollinate the expertise of specialists in performance analysis and visualization. By facilitating the beginning of significant collaborations between these groups we hope to connect those already working in the development of performance tools with those working in the visualization of software performance at all scales.

Tutorial (2:00pm - 5:55pm) *A703+A704*

Video Visualization

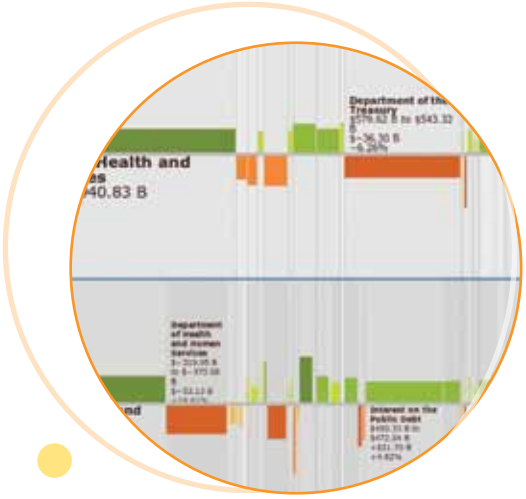
Contributors: Min Chen (University of Oxford), Daniel Weiskopf (University of Stuttgart), Rita Borgo (Swansea University), Kuno Kurzhals (University of Stuttgart), Phil Legg (University of Oxford), Rudolf Netzel (University of Stuttgart), Mario Romero (Kungliga Tekniska Högskolan), Simon Walton (University of Oxford)

Video data, generated by the entertainment industry, security and traffic cameras, video conferencing systems, video emails, and so on, is particularly time-consuming to process by human beings. The field of visualization has provided this challenging problem with a collection of techniques that transform videos to different visual forms in order to reduce the time required to watch the video. In this tutorial, we will introduce the concept

of video visualization, and several elementary techniques for processing and rendering a video into a compact visual representation. We will describe a family of visual representations, a set of insight obtained from empirical studies, and a collection of applications.

Workshop (2:00pm - 5:55pm) *A601+A602*
Workshop on Sports Data Visualization
Contributors: Rahul Basole (Georgia Institute of Technology), Edward Clarkson (Georgia Tech Research Institute), Andy Cox (The Weather Company and Crashing the Dance), Christopher Healey (North Carolina State University), John Stasko (Georgia Institute of Technology), Chad Stolper (Georgia Institute of Technology)

Few areas involve, generate, and celebrate data in the manner that sports does. The field of sports analytics is primarily associated with baseball, but has more recently spread to other sports, including basketball, soccer, professional football, ice hockey, tennis, and golf. Surprisingly, there have been few applications of visualization presentation and exploration tools to sports data. This workshop will serve as the first meeting of researchers and practitioners interested in presenting sports data through visualization. It will provide an opportunity for those engaged in this topic to interact and share their experiences. Hopefully, it will spur growth in a new sub-area of data visualization for the future.



BioVis Symposium

8:30am - 10:10am

BioVis Papers *Atrium Ballroom A*
Visualizing Networks and Interactions
Chair: Miriah Meyer

Primer Talk*: Networks and Interactions, Seán O'Donoghue

MoClo Planner: Interactive Visualization for Modular Cloning Bio-Design, Orit Shaer, Consuelo Valdes, Sirui Liu, Kara Lu, Traci Haddock, Swapnil Bhatia, Douglas Densmore, Robert Kincaid

VisNEST - Interactive Analysis of Neural Activity Data, Christian Nowke, Maximilian Schmidt, Sacha J. van Albada, Jochen M. Eppler, Rembrandt Bakker, Markus Diesmann, Bernd Hentschel, Torsten Kuhlen

neuroMap - Interactive Graph-Visualization of the Fruit Fly's Neural Circuit, Johannes Sorger, Katja Baehler, Florian Schulze, Tianxiao Liu, Barry Dickson

Genome-wide detection of sRNA targets with rNAV, Jonathan Dubois, Amine Ghozlane, Patricia Thabault, Isabelle Dutour, Romain Bourqui

10:10am - 10:30am

Coffee Break

10:30am - 12:00pm

BioVis Papers *Atrium Ballroom A*
Visualizing Population and Function
Chair: Martin Krzywinski

Primer Talk*: Population and Function, Gregory Carter

Leveraging Wall-sized High-Resolution Displays for Comparative Genomics Analyses of Copy Number Variation, Roy Ruddle, Waleed Fateen, Darren Treanor, Peter Sondergeld, Phil Quirke

HumMod Browser: An Exploratory Visualization Tool for the Analysis of Whole-Body Physiology Simulation Data, Keqin Wu, Jian Chen, William Pruett, Robert Hester

Visual Cleaning of Genotype Data, Jessie Kennedy, Martin Graham, Trevor Paterson, Andy Law

12:00pm - 2:00pm

Lunch Break

2:00pm - 3:40pm

BioVis *Atrium Ballroom A*
Contests Session

Data Contest
Chair: Will Ray

Fixing TIM: Identifying Functional Mutations in Protein Families through the Interactive Exploration of Sequence and Structural Data, John Wenskovitch, Timothy Luciani, Koonwah Chen, and G. Elisabeta Marai

Visual Analysis of Protein Sequence Mutations with RINalyzer - A BioVis Contest Contribution, Nadezhda T. Doncheva, Karsten Klein, John H. Morris, Francisco S. Domingues, Michael Wybrow, and Mario Albrecht

Mu-8: Visualizing Differences between a Protein and its Family, John Mercer, Balaji Pandian, Nicolas Bonneel, Alexander Lex, and Hanspeter Pfister

Visualizing Sequence Conservation in Protein Families, Ryo Sakai and Jan Aerts

Seeing the results of a mutation with a vertex-weighted hierarchical graph, Debra Knisley and Jeff Knisley

Introduction to the 2014 Contest - Resting State FMRI, Jason Bohland

Redesign Contest
Chair: Martin Krzywinski

Redesigning the traditional logo plots, Heike Hofmann

Sequence Bundles, Marek Kultys

Redesign of sequence logos, Ryo Sakai

3:40pm - 4:15pm

○ **Coffee Break**

4:15pm - 5:30pm

○ **BioVis** *Atrium Ballroom A*
Challenges Session
Chairs: Michel Westenberg and Sean O'Donoghue

Engaging today's genomics resources, Ting Wang

Tools for Interactive Visualization and Analysis of Complex Biological Structures, Tom Ferrin

5:30pm - 5:55pm

○ **BioVis Awards Ceremony & Closing Remarks** *Atrium Ballroom A*

LDAV Symposium

8:30am - 8:45am

○ **LDAV Papers** *Atrium Ballroom B*
Fast Forward

8:45am - 10:15am

○ **LDAV Papers** *Atrium Ballroom B*
Exploiting Parallelism for Visualization and Analysis

Portable Data-Parallel Visualization and Analysis in Distributed Memory Environments, Christopher Sewell, Li-ta Lo, James Ahrens

Efficient Parallel Volume Rendering of Large-Scale Adaptive Mesh Refinement Data, Nick Leaf, Venkatram Vishwanath, Joseph Insley, Mark Hereld, Michael E. Papka, Kwan-Liu Ma

An Analysis of Scalable GPU-Based Ray-Guided Volume Rendering, Thomas Fogal, Alexander Schiewe, Jens Krüger

10:15am - 10:30am

○ **Coffee Break**

10:30am - 12:00pm

○ **LDAV Papers** *Atrium Ballroom B*
Immersive and In situ Visualization of Large Data

In-Situ Visualization in Fluid Mechanics using Catalyst: A Case Study for Code_Saturne, Benjamin Lorendeau, Yvan Fournier, Alejandro Ribes

Visualizing Large-Scale Atomistic Simulations in Ultra-Resolution Immersive Environments, Khairi Reda, Aaron Knoll, Ken-ichi Nomura, Michael E. Papka, Andrew E. Johnson, Jason Leigh

Damaris/Viz: a Nonintrusive, Adaptable and User-Friendly In Situ Visualization Framework, Matthieu Dorier, Robert Sisneros, Tom Peterka, Gabriel Antoniu, Dave Semeraro

12:00pm - 2:00pm

○ **Lunch Break**

2:00pm - 3:30pm

○ **LDAV Papers** *Atrium Ballroom B*
Foundational Techniques for Large and Complex Data

A Provably-Robust Sampling Method for Generating Colormaps of Large Data, David Thompson, Janine Bennett, C. Seshadhri, Ali Pinar

Application-Specific Compression of Large MD Data Preserving Physical Characteristics, Patrick Gralka, Sebastian Grottel, Guido Reina, Thomas Ertl

Less After-the-Fact: Investigative Visual Analysis of Events from Streaming Twitter, Thomas Kraft, Derek Xiaoyu Wang, Jeffrey Delawder, Wenwen Dou, Li Yu, William Ribarsky

3:30pm - 4:15pm

○ **Coffee Break**

4:15pm - 4:45pm

○ **LDAV Papers** *Atrium Ballroom B*
Foundational Techniques for Large and Complex Data (Contd.)

Trelliscope: A System for Detailed Visualization in the Deep Analysis of Large Complex Data, Ryan Hafen, Luke Gosink, Jason McDermott, Karin Rodland, Kerstin Kleese-Van Dam, William S. Cleveland

4:45pm - 5:30pm

○ **LDAV Papers** *Atrium Ballroom B*
LDAV Awards and Closing

Tuesday, 15 October

8:00am - 10:00am

VIS Welcome *Atrium Ballroom AB*

Visualization vs. Expertise: Case Studies in Lexicography and Genomics

Speaker: Erez Lieberman Aiden
Assistant Professor
Department of Molecular and Human Genetics, Baylor College of Medicine
Department of Computer Science, Department of Computational and Applied
Mathematics, Harvard Society of Fellows
Director, The Center for Genome Architecture

In this talk, I use two case studies: the study of genome folding, and the study of recent human history, to discuss the emerging ways in which data visualization can complement - and in some cases, compete with - traditional forms of expertise.

First, I will describe Hi-C, a novel technology for probing the three-dimensional architecture of whole genomes. Developed together with collaborators at the Broad Institute and UMass Medical School, Hi-C couples proximity-dependent DNA ligation and massively parallel sequencing. My lab employs Hi-C to construct spatial proximity maps of the human genome. Hi-C maps have revealed that active and inactive portions of the human genome are spatially segregated, i.e., that cells employ a sort of 'regulatory origami' as they turn genes on and off. At the megabase scale, these maps are consistent with a fractal globule, a knot-free conformation that enables maximally dense packing while preserving the ability to easily fold and unfold any genomic locus. Next, I will describe collaborative efforts, together with Jean-Baptiste Michel and Google, to create tools for the visual interrogation of a significant portion of the historical record. We began by constructing a reliable corpus of digitized texts containing about 4% of all books ever printed. Analysis of this corpus enables us to investigate cultural trends quantitatively. We survey the vast terrain of 'culturomics,' focusing on linguistic and cultural phenomena that were reflected in the English language between 1800 and 2000. We show how this approach can provide insights about fields as diverse as lexicography, the evolution of grammar, collective memory, the adoption of technology, the pursuit of fame, censorship, and historical epidemiology. Such analyses are intuitive and addictive: the Google Ngram Viewer, a simple web-based tool we released for the analysis of this corpus has been used many millions of times and has recently been incorporated into Google's online dictionary.

10:00am - 10:30am

VIS Papers Fast Forward *Atrium Ballroom A*

10:30am - 11:15am

Coffee Break

11:15am - 12:30pm

VAST Introduction *A703+A704*

VAST Papers
Modeling and Decision-Making
Chair: Robert Kosara

[Best Paper] A Partition-Based Framework for Building and Validating Regression Models, Thomas Mühlbacher, Harald Piringer

Decision Exploration Lab: A Visual Analytics Solution for Decision Management, Bertjan Broeksema, Thomas Baudel, Alex Telea, Paolo Crisafulli

Vis4Heritage: Visual Analytics Approach on Grotto Wall Painting Degradations, Jiawan Zhang, Kai Kang, Dajian Liu, Ye Yuan, Yanli E

InfoVis Introduction *Atrium Ballroom A*

InfoVis Papers
Ordinal & Categorical Data
Chair: Chris Weaver

[Best Paper] LineUp: Visual Analysis of Multi-Attribute Rankings, Samuel Gratzl, Alexander Lex, Nils Gehlenborg, Hanspeter Pfister, Marc Streit

A Model for Structure-Based Comparison of Many Categories in Small-Multiple Displays, Johannes Kehrer, Harald Piringer, Wolfgang Berger, M. Eduard Gröller

Common Angle Plots as Perception-True Visualizations of Categorical Associations, Heike Hofmann, Marie Vendettuoli

SciVis Introduction *Atrium Ballroom B*

SciVis Papers
Volume and Surface Modeling
Chair: Peter Lindstrom

Fast Blending Scheme for Molecular Surface Representation, Julius Parulek, Andrea Brambilla

Detecting Symmetry in Scalar Fields Using Augmented Extremum Graphs, Dilip Mathew Thomas, Vijay Natarajan

Fast Generation of Virtual X-ray Images for Reconstruction of 3D Anatomy, Moritz Ehlke, Heiko Ramm, Hans Lamecker, Hans-Christian Hege, Stefan Zachow

12:30pm - 2:00pm

Lunch Break
Compass: Talk Research

2:00pm - 3:40pm

VAST Papers *A703+A704*

Text and Social Media

Chair: William Wright

UTOPIAN: User-Driven Topic Modeling Based on Interactive Nonnegative Matrix Factorization, Jaegul Choo, Changhyun Lee, Chandan K. Reddy, Haesun Park

HierarchicalTopics: Visually Exploring Large Text Collections Using Topic Hierarchies, Wenwen Dou, Li Yu, Xiaoyu Wang, Zhiqiang Ma, William Ribarsky

Visual Analysis of Topic Competition on Social Media, Panpan Xu, Yingcai Wu, Enxun Wei, Tai-Quan Peng, Shixia Liu, Jonathan J.H. Zhu, Huamin Qu

ScatterBlogs2: Real-Time Monitoring of Microblog Messages through User-Guided Filtering, Harald Bosch, Dennis Thom, Florian Heimerl, Edwin Püttmann, Steffen Koch, Robert Krüger, Michael Wörner, Thomas Ertl

Visual Analytics for Multimodal Social Network Analysis: A Design Study with Social Scientists, Sohaib Ghani, Bum Chul Kwon, Seungyoon Lee, Ji Soo Yi, Niklas Elmqvist

InfoVis Papers *Atrium Ballroom A*

Perception & Cognition

Chair: Heidi Lam

What Makes a Visualization Memorable?, Michelle A. Borkin, Azalea A. Vo, Zoya Bylinskii, Phillip Isola, Shashank Sunkavalli, Aude Oliva, Hanspeter Pfister

Perception of Average Value in Multiclass Scatterplots, Michael Gleicher, Michael Correll, Christine Nothelfer, Steven Franconeri

Selecting the Aspect Ratio of a Scatter Plot Based on Its Delaunay Triangulation, Martin Fink, Jan-Henrik Haunert, Joachim Spoerhase, Alexander Wolff

Interactive Visualizations on Large and Small Displays: The Interrelation of Display Size, Information Space, and Scale, Mikkel R. Jakobsen, Kasper Hornbæk

Hybrid-Image Visualization for Large Viewing Environments, Petra Isenberg, Pierre Dragicevic, Wesley Willett, Anastasia Bezerianos, Jean-Daniel Fekete

SciVis Papers *Atrium Ballroom B*

Uncertainty and Multivariate Analysis

Chair: Hans-Christian Hege

An Information-Aware Framework for Exploring Multivariate Data Sets, Ayan Biswas, Soumya Dutta, Han-Wei Shen, Jonathan Woodring

Efficient Local Statistical Analysis via Integral Histograms with Discrete Wavelet Transform, Teng-Yok Lee, Han-Wei Shen

Characterizing and Visualizing Predictive Uncertainty in Numerical Ensembles Through Bayesian Model Averaging, Luke Gosink, Kevin Bensema, Trenton Pulsipher, Harald Obermaier, Michael Henry, Hank Childs, Kenneth Joy

Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets from Simulation Ensembles, Ross T. Whitaker, Mahsa Mirzargar, Robert M. Kirby

Uncertainty Quantification in Linear Interpolation for Isosurface Extraction, Tushar Athawale, Alireza Entezari

3:40pm - 4:15pm

Coffee Break

4:15pm - 5:55pm

Panel *A703+A704*

Evaluation: How Much Evaluation is Enough?

Organizer: Robert S. Laramee

Panelists: Min Chen, David Ebert, Brian Fisher, Tamara Munzner

Most of us agree that evaluation is a critical aspect of any visualization research paper. There are many different aspects to the topic of evaluation including: performance-based such as evaluating computational speed and memory requirements. Other angles are human-centered like user-studies, and domain expert reviews to name a few examples. In order to demonstrate that a piece of visualization work yields a contribution, it must undergo some type of evaluation. The peer-review process itself is a type of evaluation. When we referee a research paper, we evaluate whether or not the visualization work being described has been evaluated adequately and appropriately. In an increasing number of cases papers are rejected based on what was judged, at that time, to contain an inadequate evaluation even though the technical or design contributions are acknowledged. However, there are differing opinions as to what constitutes an adequate or appropriate evaluation when it comes to visualization. In this panel, we discuss precisely this topic: What constitutes an adequate and appropriate evaluation of a piece of visualization work?

InfoVis Papers *Atrium Ballroom A*

Defining the Design Space

Chair: Bongshin Lee

An Empirically-Derived Taxonomy of Interaction Primitives for Interactive Cartography and Geovisualization, Robert E. Roth

A Design Space of Visualization Tasks, Hans-Jörg Schulz, Thomas Nocke, Magnus Heitzler, Heidrun Schumann

A Multi-Level Typology of Abstract Visualization Tasks, Matthew Brehmer, Tamara Munzner

Information Visualization and Proxemics: Design Opportunities and Empirical Findings, Mikkel R. Jakobsen, Yonas Sahlemariam Haile, Søren Knudsen, Kasper Hornbæk

An Interaction Model for Visualizations Beyond The Desktop, Yvonne Jansen, Pierre Dragicevic

SciVis Papers *Atrium Ballroom B*

TVCG: Scientific Visualization I

Chair: Deborah Silver

A Survey of Visualization Pipelines, Kenneth Moreland

Perceptually Based Depth-Ordering Enhancement for Direct Volume Rendering, Lin Zheng, Yingcai Wu, Kwan-Liu Ma

Lighting System for Visual Perception Enhancement in Volume Rendering, Lei Wang, Arie Kaufman

The Sinogram Polygonizer for Reconstructing 3D Shapes, Daiki Yamanaka, Yutaka Ohtake, Hiromasa Suzuki

Verifying Volume Rendering Using Discretization Error Analysis, Tiago Etiene, Daniel Jonsson, Timo Ropinski, Carlos Scheidegger, Joao Comba, L. Gustavo Nonato, Robert M. Kirby, Anders Ynnerman, Claudio T. Silva

6:00pm - 8:00pm

Meet the Candidate *A601+A602*

Wednesday, 16 October

8:00am - 8:30am

VIS Papers Fast Forward — *Atrium Ballroom A*

8:30am - 10:10am

Workshop — *A706+A707*

Using Visual Analytics to Foster Lateral Thinking About Business Problems

Contributor: Chandan Gokhale (Infosys)

Lateral thinking (also called divergent thinking) is a critical part of the sensemaking process. Moreover, researchers in the field of Visual Analytics have recognized that iterative and sequential rounds of "Convergent Thinking" and "Lateral Thinking" are necessary for arriving at the most insightful observations. The same pattern is at the heart of "Design Thinking" practiced by creative professionals. The approach leads them to holistic problem solutions that exceed what could be achieved through pure a "Convergent Thinking" approach. However, most of the BI and analytics systems used by business organizations include tools and interactive features (like filtering, sorting, selecting or "data brushing") that are primarily "convergent" in nature. There is little or no support for lateral ideation. Yet lateral thinking has a fairly well developed body of knowledge and includes easy to use techniques for developing out-of-the-box, creative design ideas. Business practitioners regularly use ideation techniques like "6 Hats", "HIT Matrix" and "BrainWriting" to bring structure to brainstorming sessions that seek out-of-the-box business ideas. Most new design or business ideas start as a "sketch" or early visualization of the idea. But there are no formal tools or techniques in commercial BI systems that allow business users to develop "sketches" of alternative business scenarios though forced and controlled data experiments - just the way a "HIT matrix" or "6 Hats" technique does in Lateral Thinking workshops. This session will introduce a number of ideation techniques designed for lateral thinking and foster discussion around how these approaches can be leveraged in the visual analytics context. The session will bring together researchers and practitioners to think about ways this can be done, and discuss challenges and potential solutions.

VAST Papers — *A703+A704*

High-Dimensional Data

Chair: Patricia Crossno

[Honorable Mention] Explainers: Expert Explorations with Crafted Projections, Michael Gleicher

Semantics of Directly Manipulating Spatializations, Xinran Hu, Lauren Bradel, Dipayan Maiti, Leanna House, Chris North, Scotland Leman

SketchPadN-D: WYDIWYG Sculpting and Editing in High-Dimensional Space, Bing Wang, Puripant Ruchikachorn, Klaus Mueller

Visual Analysis of Higher-Order Conjunctive Relationships in Multidimensional Data Using a Hypergraph Query System, Rachel Shadoan, Chris Weaver

Interactive Exploration of Implicit and Explicit Relations in Faceted Datasets, Jian Zhao, Christopher Collins, Fanny Chevalier, Ravin Balakrishnan

InfoVis Papers — *Atrium Ballroom A*

Storytelling & Presentation

Chair: Enrico Bertini

A Deeper Understanding of Sequence in Narrative Visualization, Jessica Hullman, Steven Drucker, Nathalie Henry Riche, Bongshin Lee, Danyel Fisher, Eytan Adar

SketchStory: Telling More Engaging Stories with Data through Freeform Sketching, Bongshin Lee, Rubaiat Habib Kazi, Greg Smith

Using Concrete Scales: A Practical Framework for Effective Visual Depiction of Complex Measures, Fanny Chevalier, Romain Vuillemot, Guia Gali

StoryFlow: Tracking the Evolution of Stories, Shixia Liu, Yingcai Wu, Enxun Wei, Mengchen Liu, Yang Liu

Visual Sedimentation, Samuel Huron, Romain Vuillemot, Jean-Daniel Fekete

SciVis Papers — *Atrium Ballroom B*

Vector and Flow Visualization

Chair: Eugene Zhang

Coupled Ensemble Flow Line Advection and Analysis, Hanqi Guo, Xiaoru Yuan, Jian Huang, Xiaomin Zhu

[Best Paper] Comparative Visual Analysis of Lagrangian Transport in CFD Ensembles, Mathias Hummel, Harald Obermaier, Christoph Garth, Kenneth I. Joy

[Honorable Mention] Adaptive Refinement of the Flow Map Using Sparse Samples, Samer S. Barakat, Xavier Tricoche

Visualization of Morse Connection Graphs for Topologically Rich 2D Vector Fields, Andrzej Szymczak, Levente Sipeki

Semi-Automatic Vortex Extraction in 4D PC-MRI Cardiac Blood Flow Data Using Line Predicates, Benjamin Köhler, Rocco Gasteiger, Uta Preim, Holger Theisel, Matthias Gutberlet, Bernhard Preim

10:10am - 10:30am

Coffee Break

10:30am - 12:10pm

VAST Papers — *A703+A704*

Images and Video

Chair: Rosane Minghim

VAICo: Visual Analysis for Image Comparison, Johanna Schmidt, M. Eduard Gröller, Stefan Bruckner

Open-Box Spectral Clustering: Applications to Medical Image Analysis, Thomas Schultz, Gordon L. Kindlmann

Transformation of an Uncertain Video Search Pipeline to a Sketch-Based Visual Analytics Loop, Philip A. Legg, David H.S. Chung, Matthew L. Parry, Rhodri Bown, Mark W. Jones, Iwan W. Griffiths, Min Chen

Interactive Exploration of Surveillance Video through Action Shot Summarization and Trajectory Visualization, Amir H. Meghdadi, Pourang Irani

Space-Time Visual Analytics of Eye-Tracking Data for Dynamic Stimuli, Kuno Kurzhals, Daniel Weiskopf

InfoVis Papers *Atrium Ballroom A*

Systems & Sets

Chair: Niklas Elmqvist

[Honorable Mention] Nanocubes for Real-Time Exploration of Spatiotemporal Datasets, Lauro Lins, James T. Klosowski, Carlos Scheidegger

Visualizing Request-Flow Comparison to Aid Performance Diagnosis in Distributed Systems, Raja R. Sambasivan, Ilari Shafer, Michelle L. Mazurek, Gregory R. Ganger

Evaluation of Filesystem Provenance Visualization Tools, Michelle A. Borkin, Chelsea S. Yeh, Madelaine Boyd, Peter Macko, Krzysztof Z. Gajos, Margo Seltzer, Hanspeter Pfister

Visualizing Fuzzy Overlapping Communities in Networks, Corinna Vehlow, Thomas Reinhardt, Daniel Weiskopf

Radial Sets: Interactive Visual Analysis of Large Overlapping Sets, Bilal Alsallakh, Wolfgang Aigner, Silvia Miksch, Helwig Hauser

SciVis Papers *Atrium Ballroom B*

Navigation, Interaction, and Evaluation

Chair: Georgeta-Elisabeta Marai

[Honorable Mention] Design by Dragging: An Interface for Creative Forward and Inverse Design with Simulation Ensembles, Dane Coffey, Chi-Lun Lin, Arthur G. Erdman, Daniel F. Keefe

A Multi-Criteria Approach to Camera Motion Design for Volume Data Animation, Wei-Hsien Hsu, Yubo Zhang, Kwan-Liu Ma

A Lightweight Tangible 3D Interface for Interactive Visualization of Thin Fiber Structures, Bret Jackson, Tung Yuen Lau, David Schroeder, Kimani C. Toussaint, Jr., Daniel F. Keefe

Evaluation of Static and Dynamic Visualization Training Approaches for Users with Different Spatial Abilities, Maria-Elena Froese, Melanie Tory, Guy-Warwick Evans, Kedar Shrikhande

A Systematic Review on the Practice of Evaluating Visualization, Tobias Isenberg, Petra Isenberg, Jian Chen, Michael Sedlmair, Torsten Möller

12:10pm - 2:00pm

Lunch Break

Compass: Talk Career

2:00pm - 3:40pm

Papers: Arts Program Papers *A706+A707*

Arts Program Chairs: Angus Forbes, *University of Arizona*, Lauren Thorson, *University of Iowa*

The IEEE VIS 2013 Arts Program showcases high-quality artwork and research that demonstrates and investigates the exciting and increasingly prominent intersections between art and visualization. This year, we are expanding the scope of the Arts Program by including a dedicated Arts Program papers track along with the conference art show. The theme for the 2013 Arts Program is Art+Experiment. We invited artists and researchers to think about the connections and chasms between art and research, and to explore the nature of experimental design and creative experimentation.

Art+Experiment: Introducing the IEEE VIS 2013 Arts Program, Angus Forbes, Lauren Thorson

Parallel-Coordinates Art, Julian Heinrich, Daniel Weiskopf

TweetProbe: A Real-Time Microblog Stream Visualization Framework, Byungkyu Kang, George Legrady, Tobias Hollerer

Spirograph Designs for Ambient Display of Tweets, Ye Lin, Romain Vuillemot

Medieval Information Visualization, Francis T. Marchese

Art - Science - Visualization Collaborations: Examining the Spectrum, Francesca Samsel

Art and Science as Creative Catalysts, Eleanor Gates-Stuart and Chuong Nguyen, Matt Adcock, Jay Bradley, Matthew Morell, David R. Lovell

DataRemix: Designing The Datamade Through ArtScience Collaboration, Ruth West, Roger Malina, John Lewis and Scot Gresham-Lancaster, Alejandro Borsani, Brian Merlo, Lifan Wang

XEPA: Intelligent Sculptures as Experimental Platforms for Computational Aesthetic Evaluation, Philip Galanter

Time Giver: An Installation of Collective Expression using Mobile PPG and EEG in the AlloSphere, Yuan-Yi Fan, F. Myles Sciotto, JoAnn Kuchera-Morin

TYPE + CODE II: A Code Driven Typography, Yeohyun Ahn, Ge Jin

Salton Sea Revisited: An Aesthetic Study of Realtime Lapse, Xarene Eskander

Panel *Atrium Ballroom B*

The Role of Visualization in the Big Data Era: An End to a Means or a Means to an End?

Organizer: Aritra Dasgupta

Panelists: Danyel Fisher, Carlos Scheidegger, Daniel Keim, Robert Kosara, Heidi Lam

While interpretations of the term big data vary across different stakeholders, there is no denying the fact we live in the era of big, complex, and rich data. This presents obvious opportunities to visualization for tapping into the analytical value of the data. Being a relatively nascent field compared to its exploratory data analysis siblings: statistics, machine learning, data mining, etc., there is a need for introspection into how visualization can best fit into the big data analysis pipeline. In this pipeline, while infrastructure building for big data has received most of the attention, much less focus has been on devising ways to improve interpretation of such complex data. We believe, by introspecting on the role of visualization in the big data era, we can achieve a two-fold purpose: i) highlight the visualization-specific challenges for handling big data and chart out a roadmap for the immediate future, and ii) establish visualization as a first-class citizen in the big data pipeline and thereby make a significant impact on the state-of-the-art of interpretation and analysis of such complex data.

SciVis Papers *Atrium Ballroom B*

TVCG: Scientific Visualization II

Chair: Xavier Tricoche

Physics-Based Deformable Tongue Visualization, Yin Yang, Xiaohu Guo, Jennell Vick, Luis G. Torres, Thomas Campbell

Grouper: A Compact, Streamable Triangle Mesh Data Structure, Mark Luffel, Topraj Gurung, Peter Lindstrom, Jarek Rossignac

Similarity Measures for Enhancing Interactive Streamline Seeding, Tony McLoughlin, Mark W Jones, Robert S. Laramee, Rami Malki, Ian Masters

Visualization and Analysis of Vortex-Turbine Intersections in Wind Farms, Sohail Shafii, Harald Obermaier, Rodman Linn, Eunmo Koo, Mario Hlawitschka, Christoph Garth, Bernd Hamann, Kenneth Joy

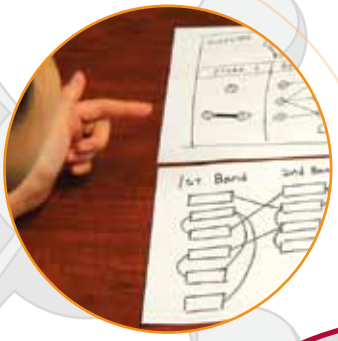
Visualizing the Variability of Gradients in Uncertain 2D Scalar Fields, Tobias Pfaffelmoser, Mihaela Mihai, Rüdiger Westermann

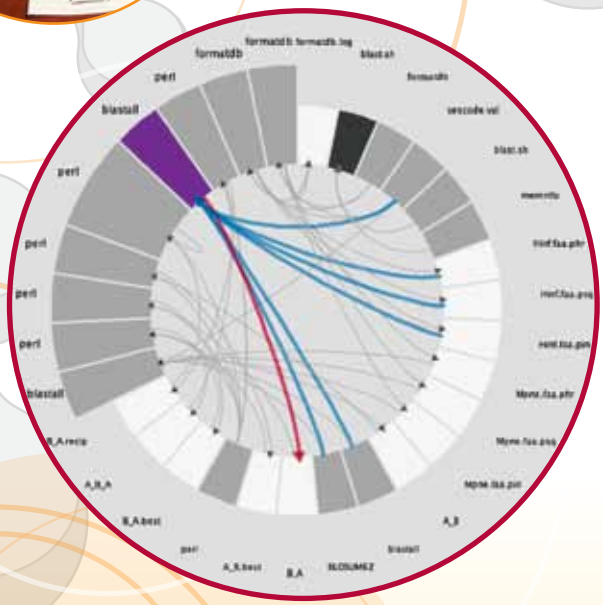
3:40pm - 4:15pm
- Coffee Break

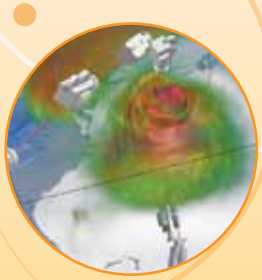
4:15pm - 5:55pm
- VIS Posters Fast Forward — *Atrium Ballroom A & B*

6:00pm - 7:00pm
- VIS Posters and Art Program — *A601+A602+A705*

7:30pm - 9:30pm
- VIS Banquet — *Atrium Ballroom ABC*







VIS 2014

10th IEEE VAST Conference
21th IEEE InfoVis Conference
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Call for Participation

VIS 2014 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 Visual Analytics Science and Technology, IEEE Information Visualization, and IEEE Scientific Visualization, by sharing your research, insights, experience, and enthusiasm.

In 2014, IEEE VIS comes for the first time in its history to Europe and the city of Paris, acknowledging the growing role of European research on visualization. Paris is a spectacular setting, combining the dynamic character of multicultural modern Europe with historical relics and monuments spanning over 2000 years. Curious visitors can explore the city's countless museums, galleries, and public spaces, while gastronomes will delight in Paris's extraordinary selection of restaurants. Located at the center of western Europe, Paris is reachable from all major international airports. The conference venue is also conveniently located next to public transportation and accessible from all of the city's main airports and train stations.

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Questions? Email info@ieeevis.org

VIS 2014 General Chair:
Jean-Daniel Fekete, *INRIA Saclay - Île-de-France*

Thursday, 17 October

8:00am - 8:30am

VIS Papers Fast Forward — *Atrium Ballroom A*

8:30am - 12:10pm

Workshop — *A706+A707*

Mobile and Breaking News: New Challenges for News Information Visualizations

Contributors: Sergio Goldenberg (Georgia Institute of Technology), Zach Pousman (Think Interactive Inc.), Nicholas Diakopoulos (Columbia University Graduate School of Journalism)

As news content moves from desktop to mobile devices and the expectations of real-time information increases, audiences are beginning to seek news visualizations for their on-the-go, fast-paced lives, and to view them on a variety of devices in a variety of contexts. These have created important challenges from a visualization and content perspective that we aim to address in this cross-discipline workshop.

The goals of this workshop are:

- To explore the challenges and opportunities for presenting and interacting with visualizations on mobile devices (smartphones and tablets), focusing on new presentation patterns and gesture controls via touch and other modalities.
- To explore the workflow, design and production challenges of creating visualizations for breaking-news, focusing on tools and techniques.
- Understand the differences between traditional visualizations and news visualizations for storytelling.

This workshop aims to attract visualization scholars, journalism theorists, journalists, user experience researchers, graphic designers, data scientists, statisticians, and programmers interested in information visualizations for news, as a way to continue the cross-discipline community that has emerged, with a new focus.

8:30am - 10:10am

VAST Papers — *A703+A704*

TVCG Visual Analytics

Chair: Huaming Qu

Abstracting Attribute Space for Transfer Function Design, Ross Maciejewski, Yun Jang, Insoo Woo, Heike Janicke, Kelly P. Gaither, David S. Ebert

Combining Computational Analyses and Interactive Visualization for Document Exploration and Sensemaking in Jigsaw, Carsten Görg, Zhicheng Liu, Jaeyeon Kihm, Jaegul Choo, Haesun Park, John T. Stasko

Bristle Maps: A Multivariate Abstraction Technique for Geovisualization, S. Kim, R. Maciejewski, A. Malik, Y. Jang, D. S. Ebert, T. Isenberg

PIWI: Visually Exploring Graphs Based on Their Community Structure (HTML), Jing Yang, Yujie Liu, Xin Zhang, Xiaoru Yuan, Ye Zhao, Scott Barlowe, Shixia Liu

The Five W's for Information Visualization with Application to Healthcare Informatics, Zhiyuan Zhang, Bing Wang, Faisal Ahmed, Iv Ramakrishnan, Rong Zhao, Asa Viccellio, Klaus Mueller

SciVis Papers — *Atrium Ballroom B*

Biomedical Visualization

Chair: Gordon Kindlmann

Interactive Patient-Specific Vascular Modeling with Sweep Surfaces, Jan Kretschmer, Christian Godenschwager, Bernhard Preim, Marc Stamminger

Area-Preservation Mapping using Optimal Mass Transport, Xin Zhao, Zhengyu Su, Xianfeng David Gu, Arie Kaufman, Jian Sun, Jie Gao, Feng Luo

Colon Flattening Using Heat Diffusion Riemannian Metric, Krishna Chaitanya Gurijala, Rui Shi, Wei Zeng, Xianfeng Gu, Arie Kaufman

Vessel Visualization using Curved Surface Reformation, Thomas Auzinger, Gabriel Mistelbauer, Ivan Baclija, Rüdiger Schernthaner, Arnold Köchl, Michael Wimmer, M. Eduard Gröller, Stefan Bruckner

ConnectomeExplorer: Query-Guided Visual Analysis of Large Volumetric Neuroscience Data, Johanna Beyer, Ali Al-Awami, Narayanan Kasthuri, Jeff W. Lichtman, Hanspeter Pfister, Markus Hadwiger

10:10am - 10:30am

Coffee Break

10:30am - 12:10pm

VAST Papers — *A703+A704*

Space and Movement

Chair: Kresimir Matkovic

An Extensible Framework for Provenance in Human Terrain Visual Analytics, Rick Walker, Aidan Slingsby, Jason Dykes, Kai Xu, Jo Wood, Phong H. Nguyen, Derek Stephens, B.L. William Wong, Yongjun Zheng

Visual Exploration of Big Spatio-Temporal Urban Data: A Study of New York City Taxi Trips, Nivan Ferreira, Jorge Poco, Huy T. Vo, Juliana Freire, Claudio T. Silva

Visual Traffic Jam Analysis Based on Trajectory Data, Zuchao Wang, Min Lu, Xiaoru Yuan, Junping Zhang, Huub van de Wetering

Space Transformation for Understanding Group Movement, Natalia Andrienko, Gennady Andrienko, Louise Barrett, Marcus Dostie, Peter Henzi

Visual Analytics for Spatial Clustering: Using a Heuristic Approach for Guided Exploration, Eli Packer, Peter Bak, Mikko NikkilÃ¤, Valentin Polishchuk, Harold J. Ship

InfoVis Papers — *Atrium Ballroom A*

Application Areas

Chair: Miriah Meyer

[Honorable Mention] SoccerStories: A Kick-off for Visual Soccer Analysis, Charles Perin, Romain Vuillemot, Jean-Daniel Fekete

Understanding Interfirm Relationships in Business Ecosystems with Interactive Visualization, Rahul C. Basole, Trustin Clear, Mengdie Hu, Harshit Mehrotra, John Stasko

Creative User-Centered Visualization Design for Energy Analysts and Modelers, Sarah Goodwin, Jason Dykes, Sara Jones, Iain Dillingham, Graham Dove, Alison Duffy, Alexander Kachkaev, Aidan Slingsby, Jo Wood

Entourage: Visualizing Relationships between Biological Pathways using Contextual Subsets, Alexander Lex, Christian Partl, Denis Kalkofen, Marc Streit, Samuel Gratzl, Anne Mai Wassermann, Dieter Schmalstieg, Hanspeter Pfister

Variant View: Visualizing Sequence Variants in their Gene Context, Joel A. Ferstay, Cydney B. Nielsen, Tamara Munzner

SciVis Papers — *Atrium Ballroom B*

Visualization Systems

Chair: Kelly Gaither

ManyVis: Multiple Applications in an Integrated Visualization Environment, Atul Rungta, Brian Summa, Dogan Demir, Peer-Timo Bremer, Valerio Pascucci

Acuity-Driven Gigapixel Visualization, Charilaos Papadopoulos, Arie E. Kaufman

An Exploration Framework to Identify and Track Movement of Cloud Systems, Harish Doraiswamy, Vijay Natarajan, Ravi S. Nanjundiah

MObjects: A Novel Method for the Visualization and Interactive Exploration of Defects in Industrial XCT Data, Andreas Reh, Christian Gusenbauer, Johann Kastner, M. Eduard Gröller, Christoph Heinzl

GRACE: A Visual Comparison Framework for Integrated Spatial and Non-Spatial Geriatric Data, Adrian Maries, Nathan Mays, Megan Olson Hunt, Kim F. Wong, William Layton, Robert Boudreau, Caterina Rosano, G. Elisabeta Marai

12:10pm - 2:00pm

Lunch Break

2:00pm - 3:40pm

VAST Special Session — *A703+A704*

Industrial Success Stories in the American Southeast: Visual "Atlanta"-lytics

Chair: Danyel Fisher, *Microsoft Research*

Panelists: Harold Ball, *FivexFive*, Matthew Martimo, *Airsage*, AK Dash, *Reed Construction*, Lucienne Ide, *Rimidi*

Visualization, analytics, and big data are actively being used to affect decision-making at exciting startups and in established companies. In this industry session, we assemble a set of hands-on, data-driven stories that will help listeners learn how visualization and analytics are put to use in the field. Practitioners will share best practices and raise questions about challenges that face them today; researchers will learn about interesting opportunities.

In a nod to the conference's setting, this session focuses on businesses in the Atlanta area. Confirmed speakers come from fields as diverse as business analytics, construction information, and cell phone analytics. We thank our friends at Juice Analytics for helping arrange this session.

InfoVis Papers — *Atrium Ballroom A*

Time, Trees & Graphs

Chair: Adam Perer

DiffAni: Visualizing Dynamic Graphs with a Hybrid of Difference Maps and Animation, Sébastien Rufiange, Michael J. McGuffin

Visualizing Change over Time Using Dynamic Hierarchies: TreeVersity2 and the StemView, John Alexis Guerra-Gómez, Michael L. Pack, Catherine Plaisant, Ben Shneiderman

Visual Compression of Workflow Visualizations with Automated Detection of Macro Motifs, Eamonn Maguire, Philippe Rocca-Serra, Susanna-Assunta Sansone, Jim Davies, Min Chen

Automatic Layout of Structured Hierarchical Reports, Eirik Bakke, David R. Karger, Robert C. Miller

Edge Compression Techniques for Visualization of Dense Directed Graphs, Tim Dwyer, Nathalie Henry Riche, Kim Marriott, Christopher Mears

3:40pm - 4:15pm

Coffee Break

4:15pm - 5:55pm

VAST Papers — *A703+A704*

Sensemaking and Collaboration

Chair: Laura McNamara

Supporting Awareness through Collaborative Brushing and Linking of Tabular Data, Amir Hossein Hajizadeh, Melanie Tory, Rock Leung

Identifying Redundancy and Exposing Provenance in Crowdsourced Data Analysis, Wesley Willett, Shiry Ginosar, Avital Steinitz, Björn Hartmann, Maneesh Agrawala

The Impact of Physical Navigation on Spatial Organization for Sensemaking, Christopher Andrews, Chris North

Using Interactive Visual Reasoning to Support Sense-Making: Implications for Design, Neesha Kodagoda, Simon Attfield, B.L. William Wong, Chris Rooney, Sharmin (Tinni) Choudhury

InfoVis Papers — *Atrium Ballroom A*

TVCG: Information Visualization

Chair: Remco Chang

Visualizing Natural Image Statistics, H. Fang, G. K. L. Tam, R. Borgo, A. J. Aubrey, P. W. Grant, P. L. Rosin, C. Wallraven, D. Cunningham, D. Marshall, M. Chen

The Generalized Sensitivity Scatterplot, Yu-Hsuan Chan, Carlos D. Correa, Kwan-Liu Ma,

Splatterplots: Overcoming Overdraw in Scatter Plots, Adrian Mayorga and Michael Gleicher

KelpFusion: a Hybrid Set Visualization Technique, Wouter Meulemans, Nathalie Henry Riche, Bettina Speckmann, Basak Alper, and Tim Dwyer

Perceptually-Driven Visibility Optimization for Categorical Data Visualization, Sungkil Lee, Mike Sips, and Hans-Peter Seidel

Panel — *Atrium Ballroom A*

Challenges for Scientific Visualization Software

Organizer: Hank Childs

Panelists: Will Schroeder, Jeremy Meredith, Kenneth Moreland, Christopher Sewell, E. Wes Bethel

Over the last twenty-five years, visualization software has evolved into robust frameworks that can be used for research projects, rapid prototype development, or as the basis of richly featured, end-user tools. For this panel, we will describe upcoming challenges facing visualization software in five categories: programming models for future architectures, maximizing performance for future architectures, application architecture and data management, data models, and rendering. Further, for each of these categories, we describe where evolutionary advances are sufficient to meet the visualization software challenges, and posit areas in which revolutionary advances are required.

Friday, 18 October

8:15am - 8:30am

VIS Papers Fast Forward — *Atrium Ballroom A*

8:30am - 10:10am

VAST Papers — *A703+A704*

Temporal Analytics

Chair: Eser Kandogan

[Honorable Mention] Temporal Event Sequence Simplification, Megan Monroe, Rongjian Lan, Hanseung Lee, Catherine Plaisant, Ben Shneiderman

Visual Analytics for Model Selection in Time Series Analysis, Markus Bögl, Wolfgang Aigner, Peter Filzmoser, Tim Lammarsch, Silvia Miksch, Alexander Rind

TimeBench: A Data Model and Software Library for Visual Analytics of Time-Oriented Data, Alexander Rind, Tim Lammarsch, Wolfgang Aigner, Bilal Alsallakh, Silvia Miksch

MotionExplorer: Exploratory Search in Human Motion Capture Data Based on Hierarchical Aggregation, Jürgen Bernard, Nils Wilhelm, Björn Krüger, Thorsten May, Tobias Schreck, Jörn Kohlhammer

Supporting the Visual Analysis of Dynamic Networks by Clustering associated Temporal Attributes, Steffen Hadlak, Heidrun Schumann, Clemens H. Cap, Till Wollenberg

InfoVis Papers — *Atrium Ballroom A*

High-Dimensional Data

Chair: Stephen North

GPLOM: The Generalized Plot Matrix for Visualizing Multidimensional Multivariate Data, Jean-François Im, Michael J. McGuffin, Rock Leung

Orthographic Star Coordinates, Dirk J. Lehmann, Holger Theisel

Dimension Projection Matrix/Tree: Interactive Subspace Visual Exploration and Analysis of High Dimensional Data, Xiaoru Yuan, Donghao Ren, Zuchao Wang, Cong Guo

Empirical Guidance on Scatterplot and Dimension Reduction Technique Choices, Michael Sedlmair, Tamara Munzner, Melanie Tory

Visualization of Shape Motions in Shape Space, Vahid Taimouri, Jing Hua

SciVis Papers — *Atrium Ballroom B*

Volume Rendering

Chair: Markus Hadwiger

Noise-Based Volume Rendering for the Visualization of Multivariate Volumetric Data, Rostislav Khlebnikov, Bernhard Kainz, Markus Steinberger, Dieter Schmalstieg

[Honorable Mention] Ambient Volume Scattering, Marco Ament, Filip Sadlo, Daniel Weiskopf

Lighting Design for Globally Illuminated Volume Rendering, Yubo Zhang, Kwan-Liu Ma

10:10am - 10:30am

Coffee Break

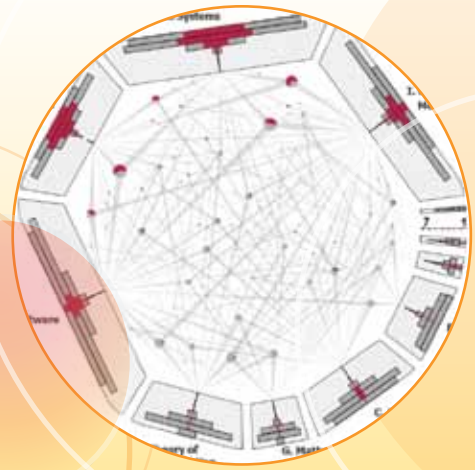
10:30am - 12:30pm

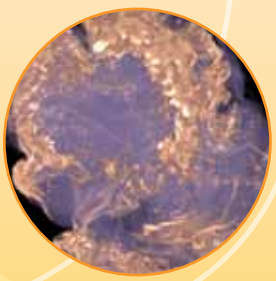
VIS Closing — *Atrium Ballroom A*

Capstone Speaker: Information Visualization: Challenges and Opportunities

Speaker: Jarke J. van Wijk, *Technische Universiteit Eindhoven*

In the past decades many new techniques have been developed to visualize and interact with abstract data, but also, many challenges remain. In my talk I will reflect on how to make progress in our field: how to identify interesting problems and next how to find effective solutions. I will begin with an attempt to identify characteristics of interesting problems, and discuss windows of opportunity for data, tasks, and users. Some problems have been solved, some are too hard to deal with, what is the range we should aim at? And what impact can be obtained? Next, I discuss strategies and approaches for finding novel solutions, such as combining existing approaches and finding inspiration in other disciplines, including art and design. This talk is based on lessons we learned while developing new techniques, and will be illustrated with a variety of cases and demos from our group at TU/e, showing successes and failures.





VIS Posters & Contests

VAST Posters

Modeling Incremental Visual Analytics Visualizations, Marco Angelini, Giuseppe Santucci

A Visual Analytics System for Stock Data, Shenghui Cheng, Zhifang Jiang, Zhiyuan Zhang, Klaus Mueller

Visualizing Hidden Themes of Trajectories with Semantic Transformation, Ding Chu, David A. Sheets, Ye Zhao, Yingyu Wu, Maogong Zheng, George Chen, Jing Yang

[Best Poster] ScagExplorer: Using Scagnostics to Cluster Huge Datasets, Tuan Nhon Dang, Leland Wilkinson

Visual Trend Analysis in Weather Forecast, Alexandra Diehl, Stefan Bruckner, M. Eduard Gröller, Claudio Delrieux, Celeste Saulo

Exploring the Effect of Visualisation Structure on a Text Analysis Task, Adam Duncan, Chris Baber

Visual Analysis of Circular Dichroism Spectra in Molecular Biophysics, Daniel Engel, Christina Gillmann, Sebastian Fiedler, Sandro Keller, Inga Scheler, Hans Hagen, Christoph Garth

The Natural Materials Browser: Using a Tablet Interface for Exploring Volumetric Materials Science Datasets, Angus Graeme Forbes, Tony Fast, Tobias Höllerer

Time Series Modeling for Smart Grid Monitoring, Georg Fuchs, Natalia Andrienko, Gennady Andrienko

Visual Analytics of Sentiment Trends in Social Media Streams: The 2013 Confederation Cup Case, Maira Gatti, Alexandre Rademaker, Daniel Lemes, Paulo Cavalin, Claudio Pinhanez, Rogerio de Paula

GapFlow: Visualizing Gaps in Care for Medical Treatment Plans, David Gotz, Nan Cao, Esther Goldbraich, Boaz Carmeli

Visualizing Locations of Interest in 2D GPS Movement Data, Shrey Gupta, Michael J. McGuffin, Thomas Kapler

Using Visual Analytics to Understand Social and Communicative Behaviors, Yi Han, Agata Rozga, John T. Stasko, Gregory D. Abowd

Using Pixel-Based Visualizations to Detect Adverse Drug Events, Ming Hao, Sebastian Mittelstädt, Meichun Hsu, Umeshwar Dayal, Joseph Terdiman, Daniel A. Keim

CateDocs: A New Visual Analytics Approach to Exploring High Dimensional Categorical Datasets, Yueqi Hu, Xiaoke Huang, Chong Zhang, Yingyu Wu, Jing Yang, Ye Zhao, Scott Barlowe, Wei Chen

Visualization of Passenger Flows on Metro, Masahiko Itoh, Daisaku Yokoyama, Masashi Toyoda, Yoshimitsu Tomita, Satoshi Kawamura, Masaru Kitsuregawa

Visualization Framework for Inter-Media Comparison using Image Flows, Masahiko Itoh, Masashi Toyoda, Cai-Zhi Zhu, Shin'ichi Satoh, Masaru Kitsuregawa

Architectural Patterns for Real-Time Visual Analytics on Streaming Data, Eser Kandogan, Danny Soroker, Steven Rohall, Peter Bak, Frank van Ham, Jie Lu, Harold-Jeffrey Ship, Chun-Fu Wang, Jennifer Lai

Graph-Based Navigation of a Box Office Prediction System, Mat Kelly, Michael L. Nelson, Michele C. Weigle

Recording Reusable and Guided Analytics From Interaction Histories, Nam Wook Kim

PetroVis: Exploratory Visualization for Petrographic Characterization, Ahmed E. Mostafa, Juliana Cevolani, Emilio Vital Brazil, Ehud Sharlin, Mario Costa Sousa

DQvis: A Toolkit for Visual Quality Analysis for Relational Database, Kun Wang, Dongxing Teng, Haiyan Yang, Cuixia Ma, Hongan Wang

Multimedia Pivot Tables, Marcel Worring, Dennis C. Koelma

Identifying Risk Factors for Birth Defects in High Dimensional Environmental Health Data, Chong Zhang, Jing Yang, F. Benjamin Zhan, Xi Gong, Jean D. Brender, Peter Langlois, Scott Barlowe

Modeling User Interactions for Complex Visual Search Tasks, J. Helen Zhao, Quan Lin, Alvitta Ottley, Remco Chang

InfoVis Posters

Serendip: Turning Topics Back to the Text, Eric Alexander, Joe Kohlmann, Robin Valenza, Michael Gleicher

[Best Poster] Visualizing Dense Dynamic Networks with Matrix Cubes, Benjamin Bach, Emmanuel Pietriega, Jean-Daniel Fekete

Illustrative Data Graphics in 18th–19th Century Style: A Case Study, Benjamin Bach, Pierre Dragicevic, Samuel Huron, Petra Isenberg, Yvonne Jansen, Charles Perin, Andre Spritzer, Romain Vuillemot, Wesley Willett, Tobias Isenberg

A Visual Language to Characterise Transitions in Narrative Visualization, Donia Badawood, Jo Wood

Time Ring Maps: Visualization for Spatiotemporal Sensor Data, P. Bak, J. von Kaenel, X. Sun, I. Dumitrescu, C. Vecchiola, O. Amarilio

Error Bars Considered Harmful, Michael A. Correll, Michael Gleicher

Size Judgment and Comparison in Tag Clouds, Khaldoon (Kal) Dhou, Robert Kosara, Mirsad Hadzikadic, Mark Faust

Visualization to Facilitate Structured Exploration of Published Findings in Rat Brain Connectivity, Hua Guo, Steven R.Gomez, Mark J. Schnitzer, David H. Laidlaw

Molecular Trajectory Projections using Molecular Symmetry, Kyle Wm. Hall, Peter G. Kusalik, Sheelagh Carpendale

Exploring Subjective Survey Classification of a Photographic Archive using Visual Analytics Alexander Kachkaev, Jo Wood

Adaptive Grid-Like Layout, Steve Kieffer, Tim Dwyer, Kim Marriott, Michael Wybrow

Bubble Heap Graphs, Gi-nam Kim, Hyoji Ha, Byung-Won On, Kyungwon Lee, Manjai Lee

Interactive Multi-resolution Exploration of Million Node Graphs, Zhiyuan Lin, Nan Cao, Hanghang Tong, Fei Wang, U Kang, Duen Horng Chau

CorrelatedMultiples: Spatially Coherent Small Multiples with Constrained Multidimensional Scaling, Xiaotong Liu, Yifan Hu, Stephen North, Teng-Yok Lee, Han-Wei Shen

Visualizing Sentiment Divergence Dynamics in Social Media Through SocialHelix, Lu Lu, Nan Cao, Zhen Wen, Fei Wang, Yu-Ru Lin, Huamin Qu

A Visual Survey of Arc Diagrams, Till Nagel, Erik Duval

Exploring Interaction Techniques and Task Types for Direct-Touch as Input Modality, Matthias Nielsen, Mikkel Baun Kjærgaard, Kaj Grønbæk

A Personal Life Review Photo Presentation Using Storyline Visualization Technique, Yuka Nomura, Takayuki Itoh, Satoshi Nakamura

Using Eye-Tracking as Interactive Input Enhances Graph Visualization, Mershack Okoe, Sayeed Safayet Alam, Radu Jianu

Using Sparklines to Reveal Trends in Parallel Coordinates, Tomasz Opach, Jimmy Johansson, Jan Ketil Rød

Towards a Formalized Process for Creating Haptic Data Visualizations, Panagiotis D. Ritsos, Sabrina A. Panëels, Peter J. Rodgers, Jonathan C. Roberts

Whale Sharks, Boolean Set Operations, and Direct Manipulation, Ramik Sadana, Alistair Dove, John Stasko

Interacting with Data Visualizations on Tablets and Phones: Developing Effective Touch-based Gestures and Operations, Ramik Sadana, John Stasko

Towards a Characterization of Guidance in Visualization, Hans-Jörg Schulz, Marc Streit, Thorsten May, Christian Tominski

Interactive 3D Gaze Visualization for Contiguous Cross-sectional Medical Images, Hyunjoo Song, Jihye Yun, Bohyoung Kim, Jinwook Seo

CiteVis: Exploring Conference Paper Citation Data Visually, John Stasko, Jaegul Choo, Yi Han, Mengdie Hu, Hannah Pileggi, Ramik Sadana, Charles D. Stolper

Can Physical Visualizations Support Analytical Tasks?, Simon Stusak, Aurélien Tabard, Andreas Butz

StFT-Stereoscopic Filtering Technique, Ragaad Al Tarawneh, Achim Ebert, Eduard Kosel

Hierarchical Qualitative Color Palettes, Martijn Tennekes, Edwin de Jonge

DreamVis: Visualizing Logged Dream Data, Riane Vardeleon, Sheelagh Carpendale

Classifying Visual Knowledge Representations: 23 Years On, Francis C.B. Williams, Jonathan C. Roberts

Enabling Visual Exploration of Long-term Physiological Data, Miriam Zisook, Javier Hernandez, Matthew S. Goodwin, Rosalind W. Picard

SciVis Posters

[Best Poster] Lightness Constancy in Surface Visualization, Danielle Albers, Alper Sarikaya, Michael Gleicher

Reconstruction of Sharp Features from Industrial CT Data, Arindam Bhattacharya, Rephael Wenger

Image-Based Exploration of Iso-Surfaces for Large Multi-Variable Datasets using Parameter Space, Roba Binyahib, Madhusudhanan Srinivasan, Christopher Knox

[Honorable Mention] überShadie: A Domain-Specific Language for General Volume Processing and Visualization on Heterogeneous Parallel Systems, Hyungseok Choi, Hanspeter Pfister, Won-Ki Jeong

Visualizing Geothermal Simulation Data with Uncertainty, Sebastian Freitag, Bernd Hentschel, Torsten Kuhlen, Jan Niederau, Christian Vogt, Anozie Ebigbo, Gabriele Marquart

Hyperslice Visualization of Metamodels for Manufacturing Processes, Sascha Gebhardt, Bernd Hentschel, Torsten Kuhlen, Toufik Al Khawli, Wolfgang Schulz

Interactive Visualization of Brain Volume Changes, Claudia Hänel, Bernd Hentschel, Torsten Kuhlen, Peter Pieperhoff, Katrin Amunts

Visual Analysis of Ionospheric Disturbance Hypotheses about Earthquake, Fan Hong, Siming Chen, Hanqi Guo, Xiaoru Yuan, Jian Huang, Yongxian Zhang

Interpolation of Non-Gaussian Probability Distributions for Ensemble Visualization, Brad E. Hollister, Alex Pang

Custom AMR In Situ Visualization with VisIt, Marc Labadens, Daniel Pomarede, Romain Teyssier, Nicolas Grandjouan

Cache Enhancement Methods for Out-Of-Core Pathline Computation, Joong-Youn Lee, Jinah Park

Time-Order Kinetic Irreversible Compression Scheme for Visualization of Large Particle System, Hiroaki Ohtani, Katsumi Hagita, Atsushi M. Ito, Tsunehiko Kato, Takayuki Saitoh, Takaaki Takeda

Understanding Performance of Protein Structural Classifiers, Alper Sarikaya, Danielle Albers, Michael Gleicher

Urban Transport Energy Consumption Explored Through 3D Arc Maps, Stephanie Schweitzer, Ariane Middel, Wenwen Zhang

[Honorable Mention] Volume Rendering with Advanced GPU Scheduling Strategies, Philip Voglreiter, Markus Steinberger, Rostislav Khlebnikov, Bernhard Kainz, Dieter Schmalstieg

Modeling of Clouds from Weather Forecast Data, Guang Yang, Chunqiang Yuan, Shiyu Hao, Xiaohui Liang,

Rendering Point Clouds with Feature Textures, Yuping Zhang, Marc Olano, Jonathan P. Dandois, Jian Chen

Vis Industry and Government Posters

Collaborative Monitoring and Interactive Decision Support System for Smart Grid Outage Management, Na Cheng, Waqas Javed, Habib Abi-Rached, Sundar Murugappan, Steve Fan, James Lin

StatMine: Visual Exploration of Official Statistics, Edwin de Jonge, Jan van der Laan, Jessica Solcer

Louvain Clustering for Big Data Graph Visual Analytics, David Gauldie, Scott Langevin, Peter Schretlen, David Jonker, Neil Bozowsky, William Wright

Visualizing Uncertain Critical Paths in Schedule Management, Robert Gove, Brandon Herzog

4D Heat Maps: Visualizing Uncertain Resource Utilization Over Time, Robert Gove, Brandon Herzog

Interactive Visual Communication of Predictive Workforce Analytics, Shubir Kapoor, Steven Rohall, Aleksandra Mojsilovic, Donna Gresh, Moninder Singh, Deepika Kakrania

Research-oriented Clinical Data Visualization based on the Analytic Health Repository: A Case of Intermountain Healthcare, Jaehoon Lee, John R. Holmen, Steve L, Catmull, Susan E. Pollock, Peter J. Haug, Stanley M. Huff

Sharable Data Presentations for a Non-Analytical Audience, James Lytle, Zach Gemignani

Interactive Visual Analysis in Engineering: From an Early Prototype to Commercially Available Applications, Krešimir Matković, Denis Gračanin, Mario Jelović, Jürgen Krasser, Helwig Hauser

Interactive Data Exploration with "Big Data Tukey Plots", Peter Schretlen, Nathan Kronenfeld, Derek Gray, Jesse McGeachie, Eric Hall, Daniel Cheng, Nicole Covello, William Wright

Interactive Visual Data Exploration Solutions for Industrial Systems, Andy Wu, Chih-Pin Hsiao, Na Cheng, Waqas Javed, James J.W. Lin

VAST Challenge

Mini-Challenge 1

Box Office Prediction using Nearest Neighbor Approach, Megha Agrawal, Nishtha Madan, Kamalakar Karlapalem

Award: Effective Visual Design

Similarity-Driven Visual-Interactive Prediction of Movie Ratings and Box Office Results, Feeras Al-Masoudi, Daniel Seebacher, Mario Schreiner, Manuel Stein, Christian Rohrdantz, Fabian Fischer, Svenja Simon, Tobias Schreck, Daniel Keim

Award: Excellent Interactive Analysis

Visual Analytics for the Prediction of Movie Rating and Box Office Performance, Mennatallah el Assady, Daniel Hafner, Michael Hund, Alexander Jäger, Wolfgang Jentner, Christian Rohrdantz, Fabian Fischer, Svenja Simon, Tobias Schrek, Daniel A. Keim

Open Weekend and Rating Prediction Based on Visualization Techniques, Elverton Fazzion, Pedro Las Casas, Glauber GonÐalves, Raquel Melo-Minardi, Wagner Meira Jr.

Award: Honorable Mention: In Depth Visual Exploration of Features
Prolix - Visual Prediction Analysis for Box Office Success, Robert Krueger, Harald Bosch, Dennis Thom, Edwin Puettmann, Qi Han, Steffen Koch, Florian Heimerl, Thomas Ertl

Excellent Visual Analysis of Structured and Unstructured Data
VAST 2013 Mini-Challenge 1: Box Office VAST - Team VADER, Yafeng Lu, Feng Wang, Ross Maciejewski

Integrating Analytical and Visual Methods for Predicting Movie Success, Philipp Omenitsch, Bilal Alsallakh, Markus BÐgl

CinemAviz, Charles Perin

Mini-Challenge 2

Award: Honorable Mention: Interesting Visualization Technique
NOCturne: A Scalable Large Format Visualization for Network Operations, Jordan Riley Benson, Rajiv Ramarajan

Award: Honorable Mention: Visualization of Event Relationships
A novel display for situational awareness at a network operations center, Andrea Brennen, David Danico, Raul Harnasch, Maureen Hunter, Richard Larkin, Jeremy Mineweaser, Kevin Nam, David O'Gwynn, Harry Phan, Alexia Schulz, Michael Snyder, Diane Staheli, Tamara Yu

Award: Outstanding Creative Design
SolarWheels: An Interactive Situation Awareness Visual Display for Large-Scale Computer Networks, Jack Shen-Kuen Chang, Weiran (Tyki) Lei, Shuang Wei, Marlen Promann, Yue (Aaron) Ma, Yingjie Victor Chen, Zhenyu Cheryl Qian

Middlesex-CALME-MC2, Sharmin (Tinni) Choudhury, Neesha Kodagoda, Ashley Wheat, Puja Varsani, William Wong, Simon Attfield, Glenford Mapp, Louis Slabbert, Mahdi Aiash, Chris Rooney

Award: Honorable Mention: Interesting Visualization Technique
Adaptive User-Aware Dashboard Design, Fabian Fischer, Dominik JÐckle, Dominik Sacha, Florian Stoffel, Daniel A. Keim

The Network Operations Management Overview (NOMO), Patrick O'Connor-Read, Ivo Federspiel

Award: Outstanding Creative Design
SpringRain: An Ambient Information Display, Marlen Promann, Yue (Aaron) Ma, Shuang Wei, Weiran (Tyki) Lei, Jack Shen-Kuen Chang, Zhenyu Cheryl Qian, Yingjie Victor Chen

A Novel Multi-scale Multi-view Display for Network Security Situation Awareness, Ying Zhao, Fangfang Zhou, Xing Liang, Yezi Huang, Ronghua Shi

Mini-Challenge 3

Award: Outstanding situation awareness
VAST 2013 Mini-Challenge 3: AnNetTe - Collaboration oriented visualization of network data, Siming Chen, Fabian Merkle, Hanna Schaefer, Cong Guo, Hongwei Ai, Xiaoru Yuan, Thomas Ertl

Award: Honorable Mention: Intriguing Visualization
VACS: Visual Analytics Suite for Cyber Security - Visual Exploration of Cyber Security Datasets (VAST Challenge 2013), Fabian Fischer, Daniel A. Keim

A Visual Analysis System for Event Detection from Network Log Data, Fangzhou Guo, Jing Xia, Xiahong Ma, Yumeng Hou, Feiran Wu, Wei Chen

AVIST: A GPU Based Animated Visualization Toolkit for Network Security Analysis, Peng Mi, Yong Cao

Award: Honorable Mention: Intriguing Visualization
Galaxy: Link Space Visualization and Analysis of Network Traffic, Elisha Peterson, Ryan Mukherjee, Saurabh Vyas, Duane Cornish

4 Steps to Visual Analytics for Cyber Security, Clifton Phua, Jun Yao Ji, Kelvin Chng, Yi Chin Lee

BIG MARKETING: The simple way of browsing system logs to detect Network Events, Jorge Kuday Picoaga, Diego Martin Cesario

A Real-Time Network Hosts Visualization System, Weijie Wang, Marlen Promann, Baijian Yang, Victor Yingjie Chen

Generic Anomaly Visualization for Daily Network Security Administration, Tao Zhang, Qi Liao, Lei Shi

Award: Outstanding comprehensive solution
MVSec: A Novel Multi-view Visualization System for Network Security, Ying Zhao, Xing Liang, Yiwen Wang, Mengjie Yang, Fangfang Zhou, Xiaoping Fan

Award: Honorable Mention: Noteworthy Collaborative Analysis Strategy
Towards Agile Cyber Analysis: Leveraging Visualizations as Functions in Collaborative Visual Analytics, Chen Zhong, Mingyi Zhao, Gaoyao Xiao, Jun Xu

BioVis Data Contest

Visual Analysis of Protein Sequence Mutations with RINalyzer, Nadezhda Doncheva, Karsten Klein, John Morris, Francisco Domingues, Michael Wybrow, Mario Albrecht

Seeing the results of a mutation with a vertex-weighted hierarchical graph, Debra Knisley, Jeff Knisley

compariSeq: Rethinking Sequence Logos, Sean McKenna, Philip S. Quinan, Alex Bigelow

Mu-8: Visualizing Differences between a Protein and its Family, John Mercer, Balaji Pandian, Nicolas Bonneel, Alexander Lex, Hanspeter Pfister

JProfileGrid Facilitates Visual Exploration of dTIM Mutations within the Context of a Family Alignment, Alberto Roca

Visualizing alignments for dTIM, Ryo Sakai

VERMONT: Visualizing mutations and their effects on protein physicochemical and topological property conservation, Sabrina Silveira, Valdete Gonçalves-Almeida, Yussif Barcelos, Elisa Lima, Flavia Aburjaile, Laerte Rodrigues, Wagner Meira Jr., Raquel Melo-Minardi

Fixing TIM: Identifying Functional Mutations in Protein Families through the Interactive Exploration of Sequence and Structural Data, John Wenskovitch, Timothy Luciani, Koonwah Chen, G. Elisabeta Marai

BioVis Redesign Contest

Sequence Logo with parallel bar, Matthias Flasko, Ulrich Lang

BioVis Sequence Logo Redesign Contest, Ekaterina Galkina

Diff Sequence Logo, Francisco Gerdau de Borja, Cristiano Carlos Matte, Carla Maria Dal Sasso Freitas

Redesigning the traditional logo plots, Heike Hofmann, Helga Hofmann

Sequence Bundles, Marek Kultys, James King, Lydia Nicholas

Sequence Logo Redesign, Eamonn Maguire, Philippe Rocca-Serra

ProfileGrids Clearly Visualize Protein Mutation Distribution Differences, Alberto Roca

Redesign of sequence logos, Ryo Sakai

Gene Slider - A Sequence Logo Interactive Data visualization tool for Education and Research, Jamie Waese, Nicholas Provart

Doctoral Colloquium 2014

CALL FOR PARTICIPATION

VIS 2014 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 VIS.

Questions? Email info@ieeevis.org

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