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Preface

EuroVis 2019, the 21th Eurographics / IEEE VGTC Conference on Visualization, was held in Porto, Portugal, on June 3-7, 2019. The proceedings are published as a special issue of the Eurographics Computer Graphics Forum journal. The conference, which started in 1990 as the Eurographics Workshop on Visualization in Scientific Computing and was called VisSym after 1999, has been known as EuroVis since 2005. EuroVis attracts contributions that broadly cover the field of visualization. Topics include visualization techniques for spatial data, such as volumetric, tensor, and vector field datasets, and for non-spatial data, such as graphs, text, and high-dimensional datasets. EuroVis also covers the theory of visualization, hardware acceleration, large datasets, perception, interaction, user studies, information visualization, visual analytics, and many application areas of visualization.

After the submission deadline in early December 2018, 189 manuscripts were reviewed in a two-stage process that resulted in 59 accepted papers and an acceptance rate of 31.2%. During the first review cycle, each paper was reviewed by at least four reviewers. The 77 primary and secondary reviewers were members of the International Program Committee (IPC) and each selected at least one additional tertiary reviewer from outside the IPC. The IPC meanwhile represents the global visualization community quite well, including members from Australia, Brazil, Asia, US, and Europe. The IPC at EuroVis is a rather dynamic committee with regular rotations after a three-year period. The review process was double-blind for tertiary reviewers: only the members of the IPC and the chairs knew the identity of the authors. A great effort was made to identify and prevent conflicts of interest at all levels, and all reviewers were asked to read and agree to the IEEE Visualization and Graphics Technical Committee (VGTC) ethics guidelines. After all the reviews were completed, the primary reviewer led an online discussion among all reviewers and was responsible for writing a summary review and recommendation. These discussions were lively, significantly helping to find a consensus. During the discussion phase, the reviews were also made available to the authors, who had the opportunity to write a response to the papers chairs. Both exchange formats, discussions and review response, were lively used and significantly helped to find a consensus. Based on the reviewers’ recommendations, the individual reviews, the online discussions, the authors’ review response, and after a thorough deliberation by the paper chairs, 59 papers were conditionally accepted. Three additional papers were invited for a fast-track review process to Computer Graphics Forum for possible publication in a future issue. In the second review cycle, the revised papers were again carefully reviewed by the primary reviewers, and due to the significant improvements 58 papers were finally accepted for publication. One paper opted for a major revision. We helped to shape the reviews to be as constructive as possible to also provide the authors of rejected papers with substantial feedback for their further research.

We are thankful to everybody who helped to make the event possible. We thank the IPC members for their careful and timely work in all stages of the reviewing process and the tertiary reviewers for providing in-depth assessments of the submissions. We thank our invited speakers Paul A. Navrátil and Jeffrey Heer. We thank the chairs of the short paper track, Jimmy Johansson, Filip Sadlo, G. Elisabeta Marai, the chairs of the STARs, Robert S. Laramee, Steffen Oeltze, Michael Sedlmair, and the chairs of the Posters track, João Madeiras Pereira, Renata Raidou, for their great efforts in their corresponding tracks that make EuroVis such a successful conference. We also thank all the chairs of the co-located workshops, and Stefanie Behnke, who has been very helpful throughout all the process of publication of this journal. We also would like to thank the authors of all submitted papers and all conference attendees.

Finally, a special thanks goes to Alfredo Ferreira, Joaquim A. Jorge, António Coelho, Luís Paulo Santos for the entire organization of EuroVis 2019.

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Afonso, Ana Paula
Agus, Marco
Ahmed, Reyan
Albo, Yael
Alexander, Eric
Alsaffakh, Bilal
Alsbaugh, Sara
Angelini, Marco
Athawale, Tushar
Bach, Benjamin
Badam, Sriram Karthik
Bailly, Gilles
Baum, Daniel
Beecham, Roger
Behrisch, Michael
Bekker, Henk
Berger, Matthew
Bergner, Steven
Bernard, Jürgen
Berti, Enrico
Bezerrados, Anastasia
Bhatia, Harsh
Blaaschek, Tanja
Blumenschein, Michael
Bolte, Fabian
Boorboor, Saeed
Borgo, Rita
Borkin, Michelle
Bors, Christian
Bourqui, Romain
Boy, Jeremy
Brehmer, Matthew
Bruckner, Stefan
Byška, Jan
Cabello, Sergio
Cappers, B.C.M. (Bram)
Carmo, Maria Beatriz
Chan, Gronit Yek-Yeun
Chang, Jerry Shih-Ping
Chen, Guoning
Chen, Sining
Chen, Bing-Yu
Chen, Yang
Cheng, Hsueh-Chien
Chevalier, Fanny
Childs, Hank
Cho, Kyunghyun
Choo, Jaegul
Cmentowski, Sebastian

Coimbra, Danilo Barbosa
Collins, Christopher
Coltekin, Arzu
Comba, Joao Dihl
Cordeil, Maxime
Correll, Michael
Dachselt, Raimund
Dang, Tommy
Demiralp, Cagatay
Devkota, Sabin
Diehl, Stephan
Diehl, Alexandra
Dietrich, Carlos
Döllner, Jürgen
Dou, Wenwen
Du, Ruofei
Dunne, Cody
Dwyer, Tim
Dykes, Jason
Edge, Darren
Eggert, Daniel
Eilemann, Stefan
El-Assady, Mennatallah
Elmqvist, Niklas
Elshehaly, Mai
Everts, Maarten
Fan, Chaoan
Faust, Rebecca
Fekete, Jean-Daniel
Fisher, Danyel
Fisher, Brian
Forbes, Angus
Frey, Steffen
Fuchs, Georg
Garderen, Mereke van
Gehlenborg, Nils
Giachetti, Andrea
Giesen, Joachim
Giot, Romain
Gleicher, Michael
Goffin, Pascal
Gomez-Nieto, Erick
Gonçalves, Daniel
Gosink, Luke
Gou, Liang
Gove, Robert
Goyal, Dashyan
Gracanin, Denis
Gschwandtner, Theresia
Gunhold, Stefan
 Günther, Tobias
Günther, David
Heard, Marti
Hege, Hans-Christian
Heimerl, Florian
Heinzel, Christoph
Hernández, Benjamin
Hierichs, Uta
Hlawitschka, Mario
Hoffmann, Lutz
Höllt, Thomas
Hong, Seokhee
Hong, Sungsoo (Ray)
Hoon, Niels de
Huang, Zhaosong
Humayoun, Shah Rukh
Hurter, Christophe
Isac, Katherine
Isenberg, Petra
Itoh, Masahiko
Jackson, Bret
Jadhav, Shreeraj
Jeong, Dong Hyun
Kalantari, Leila
Kalkofen, Denis
Kanzler, Mathias
Kaufman, Shaked
Khan, Taimur
Kindlmann, Gordon
Klemm, Paul
Kobourov, Stephen
Koch, Steffen
Koop, David
Kozlikova, Barbora
Krause, Josua
Krekhov, Andrey
Krüger, Robert
Kumar, Ayush
Kumpf, Alexander
Kwon, Oh-Hyun
Lage, Marcus
Lam, Heidi
Lanir, Joel
Laramee, Robert
Lavreentiev, Valery
Law, Po-Ming
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Lu, Min
Lu, Yafeng
Lundström, Claes
L’Yi, Sehi
Ma, Yuxin
Ma, Bo
Maljovec, Dan
Masood, Talha Bin
McKenna, Sean
Merino, Leonel
Meuschke, Monique
Micallaf, Luana
Michalski, Michael
Miksch, Silvia
Milios, Evangelos
Ming, Yao
Minghim, Rosane
Misue, Kazuo
Molchanov, Vladimir
Moreland, Kenneth
Mosca, Abigail
Motschnig, Renate
Mueller, Thomas
Mühlbacher, Thomas
Nacenta, Miguel
Nagel, Till
Nahmias, Liad
Nedel, Luciana
Neuroth, Tyson
Nocke, Thomas
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Oliveira, Maria Cristina F. de
Onoue, Yosuke
Oslejšek, Radek
Otley, Alvitta
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Patel, Daniel
Paulovich, Fernando
Peltonen, Jaakko
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Perer, Adam
Pezzotti, Nicola
Pfeiffer, Linda
Pinaud, Bruno
Pintore, Giovanni
Piringer, Harald
Pirsiavash, Hamed
Poco, Jorge
Potter, Kristi
Preuß, Daniel
Prouzeau, Arnaud
Pugmire, David
Quan, Nguyen
Raidou, Renata Georgia
Rajji, Mohammad
Rautek, Peter
Reda, Khairi
Renoust, Benjamin
Rensink, Ronald
Richer, Gaëlle
Röber, Niklas
Rodgers, Peter
Rosen, Paul
Ruchikachorn, Puripant
Rupprecht, Franca
Sadlo, Filip
Sallaberry, Arnaud
Sanyal, Jibo
Sarikaya, Alper
Scheidegger, Carlos
Schloss, Karen
Schmalstieg, Dieter
Schmidt, Johanna
Schmidt, Christoph
Schneider, Jens
Schorer, Karl-Michael
Schultz, Thomas
Schulz, Hans-Jörg
Sedlmair, Michael
Setlur, Vidya
Shi, Lei
Shudler, Sergei
Sicat, Ronell
Singun, Amando
Skraba, Primoz
Sorger, Johannes
Spechtenhauser, Florian
Sreerevatsan, Jaya
Srinivasa, Arjun
Stein, Manuel
Stone, John
Stoppel, Sergej
Stroebelt, Hendrik
Sultanum, Nicole
Summa, Brian
Sun, Maoyuan
Tam, Gary
Tatu, Andráda
Taylor, Russell M.
Theussl, Thomas
Thom, Dennis
Thompson, John
Thöny, Matthias
Trapp, Matthias
Trimm, David
Turkay, Cagatay
University, Kevin
Velez, Maria
Vilanova, Anna
Viola Rojas, Ivan
Vital, Emilio
Vrotsou, Katerina
Vuilleumier Brazil, Romain
Wald, Ingo
Wall, Emily
Wallner, Günter
Wang, Zeyu
Wang, Ji
Wang, Xiting
Wang, Feng
Wang, Xiaoyi
Wang, Zhe
Wang, Bei
Wattenberg, Martin
Weaver, Chris
Weber, Gerhard
Weinkauf, Tino
Wetering, Huub van de
Wiebel, Alexander
Willett, Wesley
Wodo, Olga
Wolff, Alexander
Wongsuphasawat, Kanit
Wu, Yingcai
Wu, Jieting
Xia, Jiazi
Xie, Cong
Xu, Kai
Xu, Panpan
Yang, Yalong
Ynnerman, Anders
# TABLE OF CONTENTS

## Best Paper Award Nominees

- **V-Awake: A Visual Analytics Approach for Correcting Sleep Predictions from Deep Learning Models**
  Humberto Simon Garcia Caballero, Michel A. Westenberg, Binyam Gebre, and Jarke J. van Wijk
  1

- **Optimizing Stepwise Animation in Dynamic Set Diagrams**
  Kazuyo Mizuno, Hsiang-Yun Wu, Shigeo Takahashi, and Takeo Igarashi
  13

- **Interactive Visualization of Flood and Heavy Rain Simulations**
  Daniel Cornel, Andreas Butttinger-Kreuzhuber, Artem Konev, Zsolt Horváth, Michael Wimmer, Raimund Heidrich, and Jürgen Waser
  25

- **Follow The Clicks: Learning and Anticipating Mouse Interactions During Exploratory Data Analysis**
  Alvitta Ottley, Roman Garnett, and Ran Wan
  41

- **A Framework for GPU-accelerated Exploration of Massive Time-varying Rectilinear Scalar Volumes**
  Fabio Marton, Marco Agus, and Enrico Gobbetti
  53

## Analysis Applications and Systems

- **Latent Space Cartography: Visual Analysis of Vector Space Embeddings**
  Yang Liu, Eunice Jun, Qisheng Li, and Jeffrey Heer
  67

- **Multiple Views: Different Meanings and Collocated Words**
  Jonathan C. Roberts, Hayder Mahdi Al-maneea, Peter W. S. Butcher, Robert Lew, Geraint Paul Rees, Nirwan Sharma, and Ana Frankenberg-Garcia
  79

- **DIVA: Exploration and Validation of Hypothesized Drug-Drug Interactions**
  Tabassum Kakar, Xiao Qin, Elke A. Rundensteiner, Lane Harrison, Sanjay K. Sahoo, and Suranjan De
  95

- **CV3: Visual Exploration, Assessment, and Comparison of CVs**
  Velitchko Andreev Filipov, Alessio Arleo, Paolo Federico, and Silvia Miksch
  107

- **VIAN: A Visual Annotation Tool for Film Analysis**
  Gaudenz Halter, Rafael Ballester-Ripoll, Barbara Flueckiger, and Renato Pajarola
  119

## Analysis and Decision Making

  Min Chen and David S. Ebert
  131

- **Characterizing Exploratory Visual Analysis: A Literature Review and Evaluation of Analytic Provenance in Tableau**
  Leilani Battle and Jeffrey Heer
  145

- **Investigating Effects of Visual Anchors on Decision-Making about Misinformation**
  Ryan Wesslen, Sashank Santhanam, Alireza Karduni, Isaac Cho, Samira Shaikh, and Wenwen Dou
  161

- **An Exploratory User Study of Visual Causality Analysis**
  Chi-Hsien Eric Yen, Aditya Parameswaran, and Wai-Tat Fu
  173
# TABLE OF CONTENTS

**A User-based Visual Analytics Workflow for Exploratory Model Analysis**
Dylan Cashman, Shah Rukh Humayoun, Florian Heimerl, Kendall Park, Subhajit Das, John R. Thompson, Bahador Saket, Abigail Mosca, John Stasko, Alex Endert, Michael Gleicher, and Remco Chang

**Analysis Techniques**

- *Toward Understanding Representation Methods in Visualization Recommendations through Scatterplot Construction Tasks*
  Sehi L’Yi, Youli Chang, DongHwa Shin, and Jinwook Seo

- *Oui! Outlier Interpretation on Multi-dimensional Data via Visual Analytics*
  Xun Zhao, Weiwei Cui, Yanhong Wu, Haidong Zhang, Huamin Qu, and Dongmei Zhang

- *ClustMe: A Visual Quality Measure for Ranking Monochrome Scatterplots based on Cluster Patterns*
  Mostafa M. Abbas, Michaël Aupetit, Michael Sedlmair, and Halima Bensmail

**Vectors and Features**

- *The Dependent Vectors Operator*
  Lutz Hofmann and Filip Sadlo

**Higher-Order Data Types**

- *Visualization of Equivalence in 2D Bivariate Fields*
  Boyan Zheng, Bastian Rieck, Heike Leitte, and Filip Sadlo

- *Towards Glyphs for Uncertain Symmetric Second-Order Tensors*
  Tim Gerrits, Christian Rössl, and Holger Theisel

- *Robust Extraction and Simplification of 2D Symmetric Tensor Field Topology*
  Jochen Jankowai, Bei Wang, and Ingrid Hotz

- *Visualization Support for Developing a Matrix Calculus Algorithm: A Case Study*
  Joachim Giesen, Julien Klaus, Sören Laue, and Ferdinand Schreck
TABLE OF CONTENTS

Examining Implicit Discretization in Spectral Schemes 363
P. Samuel Quinan, Lace M. K. Padilla, Sarah H. Creem-Regehr, and Miriah Meyer

Time Series

Bridging the Data Analysis Communication Gap Utilizing a Three-Component Summarized Line Graph 375
Calvin Yau, Morteza Karimzadeh, Chittayong Surakitbanharn, Niklas Elmqvist, and David S. Ebert
ChronoCorrelator: Enriching Events with Time Series 387
Martijn A.M.M. van Dortmont, Stef van den Elzen, and Jarke J. van Wijk
Visual-Interactive Preprocessing of Multivariate Time Series Data 401
Jürgen Bernard, Marco Hutter, Heiko Reinemuth, Hendrik Pfeifer, Christian Bors, and Jörn Kohlhammer

Biomedical Applications and Ray Tracing

A Geometric Optimization Approach for the Detection and Segmentation of Multiple Aneurysms 413
Kai Lawonn, Monique Meuschke, Ralph Wickenhöfer, Bernhard Preim, and Klaus Hildebrandt
Interactive Volumetric Visual Analysis of Glycogen-derived Energy Absorption in Nanometric Brain Structures 427
Marco Agus, Corrado Culi, Ali K. Al-Awami, Enrico Gobbetti, Pierre J. Magistretti, and Markus Hadwiger
Analysis of Long Molecular Dynamics Simulations Using Interactive Focus+Context Visualization 441
Jan Byška, Thomas Trautner, Sérgio M. Marques, Jiří Damborský, Barbora Kozliková, and Manuela Waldner
Scalable Ray Tracing Using the Distributed FrameBuffer 455
Will Usher, Ingo Wald, Jefferson Amstutz, Johannes Günther, Carson Brownlee, and Valerio Pascucci
Ray Tracing Generalized Tube Primitives: Method and Applications 467
Mengjiao Han, Ingo Wald, Will Usher, Qi Wu, Feng Wang, Valerio Pascucci, Charles D. Hansen, and Chris R. Johnson

Spatial Data Applications

Visual Analysis of Charge Flow Networks for Complex Morphologies 479
Sathish Kottravel, Martin Falk, Talha Bin Masood, Mathieu Linares, and Ingrid Hotz
IGM-Vis: Analyzing Intergalactic and Circumgalactic Medium Absorption Using Quasar Sightlines in a Cosmic Web Context 491
Joseph N. Burchett, David Abramov, Jasmine Tan Otto, Cassia Aritanegara, Jason Xavier Prochaska, and Angus G. Forbes
Analysis of Decadal Climate Predictions with User-guided Hierarchical Ensemble Clustering 505
Christopher P. Kappe, Michael Böttinger, and Heike Leitte
Evaluating Image Quality Measures to Assess the Impact of Lossy Data Compression Applied to Climate Simulation Data 517
Allison H. Baker, Dorit M. Hammerling, and Terece L. Turton
# TABLE OF CONTENTS

## Interaction Techniques for Scalability

- **Kyrix: Interactive Pan/Zoom Visualizations at Scale**
  - Wenbo Tao, Xiaoyu Liu, Yedi Wang, Leilani Battle, Çağatay Demiralp, Remco Chang, and Michael Stonebraker
  - Page 529

- **Designing Animated Transitions to Convey Aggregate Operations**
  - Younghoon Kim, Michael Correll, and Jeffrey Heer
  - Page 541

- **Hybrid Touch/Tangible Spatial 3D Data Selection**
  - Lonni Besançon, Mickael Sereno, Lingyun Yu, Mehdi Ammi, and Tobias Isenberg
  - Page 553

- **Focus+Context Exploration of Hierarchical Embeddings**
  - Thomas Höllt, Anna Vilanova, Nicola Pezzotti, Boudewijn P. F. Lelieveldt, and Helwig Hauser
  - Page 569

## Geospatial and Social Data

- **Route-Aware Edge Bundling for Visualizing Origin-Destination Trails in Urban Traffic**
  - Wei Zeng, Qiaomu Shen, Yuzhe Jiang, and Alexandru Telea
  - Page 581

- **Bird’s-Eye - Large-Scale Visual Analytics of City Dynamics using Social Location Data**
  - Robert Krueger, Qi Han, Nikolay Ivanov, Sanae Mahtal, Dennis Thom, Hanspeter Pfister, and Thomas Ertl
  - Page 595

- **Topic Tomographies (TopTom): a Visual Approach to Distill Information From Media Streams**
  - Beatrice Gobbo, Duilio Balsamo, Michele Mauri, Paolo Bajardi, André Panisson, and Paolo Ciuccarelli
  - Page 609

- **Segmentifier: Interactive Refinement of Clickstream Data**
  - Kimberly Dextras-Romagnino and Tamara Munzner
  - Page 623

## Interaction Techniques

- **Augmenting Tactile 3D Data Navigation With Pressure Sensing**
  - Xiyao Wang, Lonni Besançon, Mehdi Ammi, and Tobias Isenberg
  - Page 635

- **InsideInsights: Integrating Data-Driven Reporting in Collaborative Visual Analytics**
  - Andreas Mathisen, Tom Horak, Clemens Nylandsted Klokmose, Kaj Grønbæk, and Niklas Elmqvist
  - Page 649

- **Investigating the Manual View Specification and Visualization by Demonstration Paradigms for Visualization Construction**
  - Bahador Saket and Alex Endert
  - Page 663

- **Linking and Layout: Exploring the Integration of Text and Visualization in Storytelling**
  - Qiyu Zhi, Alvitta Ottley, and Ronald Metoyer
  - Page 675

- **Capture & Analysis of Active Reading Behaviors for Interactive Articles on the Web**
  - Matthew Conlen, Alex Kale, and Jeffrey Heer
  - Page 687

## Graphs and Networks

- **netflower: Dynamic Network Visualization for Data Journalists**
  - Christina Stoiber, Alexander Rind, Florian Grassinger, Robert Gutounig, Eva Goldgruber, Michael Sedlmair, Štefan Emrich, and Wolfgang Aigner
  - Page 699

- **Efficient Optimal Overlap Removal: Algorithms and Experiments**
  - Wouter Meulemans
  - Page 713
TABLE OF CONTENTS

A Stable Graph Layout Algorithm for Processes  
Robin J. P. Mennens, Roeland Scheepens, and Michel A. Westenberg  
725

A Random Sampling $O(n)$ Force-calculation Algorithm for Graph Layouts  
Robert Gove  
739
Author Index

Abbas, Mostafa M. ............ 225
Abramov, David ............ 491
Agus, Marco ............ 53, 427
Aigner, Wolfgang ........... 699
Al-Awami, Ali K. ............ 427
Al- maneaa, Hayder Mahdi ... 79
Ammi, Mehdi ............ 553, 635
Amstutz, Jefferson ........... 455
Angelini, Marco ............ 237
Arleo, Alessio ............ 107
Artanegara, Cassia ............ 491
Aupetit, Michaël ............ 401
Bajardi, Paolo ............ 609
Baker, Allison H. ............ 517
Ballester-Ripoll, Rafael ........... 119
Balsamo, Duilio ............ 609
Battle, Leilani ............ 145, 529
Beenhouwer, Jan De ........... 273
Bensmail, Halima ............ 225
Bernard, Jürgen ............ 401
Besançon, Lonnli ............ 553, 635
Bors, Christian ............ 401
Böttger, Michael ............ 505
Byška, Jan ............ 441
Caballero, Carson ............ 455
Buchmüller, Juri ............ 237
Burchett, Joseph N. ............ 491
Butcher, Peter W. S. ............ 79
Buttinger-Kreuizhuber, A. ....... 25
Byška, Jan ............ 441
Caballero, Humberto S. G. ........... 1
Calì, Corrado ............ 427
Cashman, Dylan ............ 185
Chang, Remco ............ 185, 529
Chang, Youli ............ 201
Chen, Min ............ 131
Cho, Isaac ............ 161
Choi, Jinho ............ 249
Choo, Jaegul ............ 249
Ciuccarelli, Paolo ............ 609
Conlen, Matthew ............ 687
Cornel, Daniel ............ 25
Correll, Michael ............ 541
Creem-Regehr, Sarah H. ............ 363
Cui, Weiwei ............ 213
Damborský, Jiří ............ 441
Das, Subhajit ............ 185
De, Suranjana ............ 95
Demiralp, Çağatay ............ 529
Dextra-Romagnino, K. ............ 623
Dortmont, Martijn van ............ 387
Dou, Wenwen ............ 161
Ebert, David S. ............ 131, 375
Elberfeld, Tim ............ 273
Elmqvist, Niklas ............ 249, 375, 649
Elzen, Stef van den ............ 387
Emrich, Stefan ............ 699
Endert, Alex ............ 185, 663
Ertl, Thomas ............ 595
Erleben, Marco ............ 401
Falk, Martin ............ 479
Federico, Paolo ............ 107
Filippov, Velitchko Andreev ............ 107
Fluckiger, Barbara ............ 119
Forbes, Angus G. ............ 491
Frankenberg-Garcia, Ana ............ 79
Fröhler, Bernhard ............ 273
Fu, Wai-Tat ............ 173
Garnett, Roman ............ 41
Gebre, Binyam ............ 1
Gerrits, Tim ............ 325
Giesen, Joachim ............ 351
Gicher, Michael ............ 185
Gobetti, Enrico ............ 53, 427
Gobbo, Beatrice ............ 609
Goldgruber, Eva ............ 699
Gove, Robert ............ 739
Grassinger, Florin ............ 699
Gronbaek, Kaj ............ 649
Günther, Johannes ............ 455
Günther, Tobias ............ 285
Gutounig, Robert ............ 699
Hadwiger, Markus ............ 427
Halter, Gaudenz ............ 119
Hammerling, Dorit M. ............ 517
Han, Mengjiao ............ 467
Han, Qi ............ 595
Hansen, Charles D. ............ 467
Harrison, Lane ............ 95
Hauser, Helwig ............ 569
Heer, Jeffrey ............ 67, 145, 541, 687
Hege, Hans-Christian ............ 273
Heidrich, Raimund ............ 25
Heimerl, Florian ............ 185
Heinzl, Christoph ............ 273
Hildebrandt, Klaus ............ 413
Hofmann, Lutz ............ 261
Höllt, Thomas ............ 569
Horak, Tom ............ 649
Horváth, Zsolt ............ 25
Hotz, Ingrid ............ 337, 479
Humayoun, Shah Rukh ............ 185
Hutter, Marco ............ 401
Igarashi, Takeo ............ 13
Isenberg, Tobias ............ 553, 635
Ivanov, Nikolay ............ 595
Jankowai, Jochen ............ 337
Jiang, Yuzhe ............ 581
Johnson, Chris R. ............ 467
Jun, Eunice ............ 67
Jung, Sanghun ............ 249
Kakar, Tabassum ............ 95
Kale, Alex ............ 687
Kappe, Christopher P. ............ 505
Karduni, Alireza ............ 161
Karimzadeh, Morteza ............ 375
Kastner, Johann ............ 273
Keim, Daniel A. ............ 237
Kim, Byungsoo ............ 285
Kim, Younghoon ............ 541
Klaus, Julien ............ 351
Klokemose, Clemens N. ............ 649
Kohlhammer, Jörn ............ 401
Koniev, Artem ............ 25
Kotravel, Sathish ............ 479
Kozliková, Barbora ............ 441
Krueger, Robert ............ 595
Laue, Sören ............ 351
Lawonn, Kai ............ 413
Leitte, Heike ............ 311, 505
Lelieveldt, Boudewijn P. F. ............ 569
Author Index

Lew, Robert ..................... 79
Li, Qisheng ..................... 67
Linares, Mathieu ............... 479
Liu, Xiaoyu ..................... 529
Liu, Yang ....................... 67
L’Yi, Sehi ....................... 201
Ma, Kwan-Liu ................... 297
Magistretti, Pierre J. .......... 427
Mahtal, Sanae ................... 595
Marques, Sérgio M. ............ 441
Marton, Fabio ................... 53
Masood, Talha Bin .............. 479
Mathisen, Andreas ............. 649
Mauri, Michele .................. 609
Mennens, Robin J. P. .......... 725
Meschenmoser, Philipp ......... 237
Metoyer, Ronald ............... 675
Meulemans, Wouter ............ 713
Meuschke, Monique ............ 413
Meyer, Miriah ................... 363
Miksch, Silvia ................... 107
Mizuno, Kazuyo ................ 13
Möller, Torsten ............... 273
Mosca, Abigail ................. 185
Munzner, Tamara .............. 623
Neuroth, Tyson A. ............. 297
Ottley, Alvitta ................. 41, 675
Otto, Jasmine Tan ............. 491
Padilla, Lace M. K. ........... 363
Pajarola, Renato ............... 119
Panisson, André ............... 609
Parameswaran, Aditya ......... 173
Park, Deok Gun ................ 249
Park, Kendall ................... 185
Pascucci, Valerio .............. 455, 467
Pezzotti, Nicola ................ 569
Pfeifer, Hendrik ............... 401
Pfister, Hanspeter .............. 595
Preim, Bernhard ............... 413
Prochaska, Jason Xavier ...... 491
Qin, Xiao ....................... 95
Qu, Huamin ..................... 213
Rees, Geraint Paul ............ 79
Reinemuth, Heiko ............. 401
Rieck, Bastian .................. 311
Sadlo, Filip ..................... 261, 311
Sahoo, Sanjay K. ............... 95
Saket, Bahador ................. 185, 663
Santhanam, Sashank .......... 161
Santucci, Giuseppe ............ 237
Sauer, Franz .................... 297
Scheepens, Roeland ........... 725
Schreck, Ferdinand ............ 351
Sedlmair, Michael ............. 225, 699
Seo, Jinwook ................... 201
Sereno, Mickael ............... 553
Shaikh, Samira ................. 161
Sharma, Nirwan ............... 79
Shen, Qiaomo ................... 581
Shin, DongHwa ................. 201
Sijbers, Jan ..................... 273
Stasko, John .................... 185
Stoiber, Christina ............. 699
Stonebraker, Michael .......... 529
Surakithbanharn, Chittayong .. 375
Takahashi, Shigeo ............. 13
Tao, Wenbo ..................... 529
Telea, Alexandru .............. 581
Theisel, Holger ................. 325
Thom, Dennis ................... 595
Thompson, John R. ............ 185
Trautner, Thomas ............. 441
Turton, Teree L. ............... 517
Usher, Will ...................... 455, 467
Vilanova, Anna ................. 569
Wald, Ingo ...................... 455, 467
Waldner, Manuela ............. 441
Wan, Ran ......................... 41
Wang, Bei ....................... 337
Wang, Feng ...................... 467
Wang, Xiyaq ..................... 635
Wang, Yedi ....................... 529
Waser, Jürgen ................... 25
Weissenböck, Johannes ....... 273
Wesslen, Ryan ................... 161
Westenberg, Michel A. ....... 1, 725
Wickenhöfer, Ralph ........... 413
Wijk, Jarke J. van ............. 1, 387
Wimmer, Michael ............... 25
Wu, Hsiang-Yun ................ 13
Wu, Qi .......................... 467
Wu, Yanhong .................... 213
Yau, Calvin ..................... 375
Yen, Chi-Hsien Eric ........... 173
Yu, Lingyun ..................... 553
Zeng, Wei ....................... 581
Zhang, Haidong ................. 213
Zhang, Dongmei ................. 213
Zhao, Xun ....................... 213
Zheng, Boyan ................... 311
Zhi, Qiyu ......................... 675
Invited Talk: Keynote

Let Me Tell You a Story: Enabling Effective and Scalable Communication of Scientific Insights

Paul A. Navrátil

Abstract
From time before history, humans have used imagery to shape ideas and communicate important concepts to their communities. Visualization harnesses this fundamental mode through transforming raw data into images that present actionable insights and discoveries to advance human understanding. Yet, even as techniques in scivis, infovis, and vis analytics progress, the effective application of these techniques to solve analysis problems remains very much an art plied by specialized visualization experts who understand both the tools and how to best wield them. As our data sources multiply, and the commensurate need for analysis of those data expand, relying solely on vis experts will not scale. The visualization community will need to provide simple, reliable, and expressive tools so that domain scientists can generate high-quality visualizations sooner in their discovery pipelines, challenging visualization experts to expand the state of the art in translating research to practice. This talk will present challenges to this vision and potential transformative solutions in the context of work at the Texas Advanced Computing Center and peer institutions world-wide.

Short Biography
Dr. Paul A. Navrátil is a Research Scientist and Director of Visualization at the Texas Advanced Computing Center (TACC) at the University of Texas at Austin. He is an expert in high-performance visualization technologies, accelerator-based computing and advanced rendering techniques. His research seeks to improve analytic capacity and insight communication across scientific workflows, including efficient algorithms for large-scale parallel visualization and data analysis (VDA) and innovative design for immersive VDA systems. Dr. Navrátil’s recent work includes algorithms for large-scale distributed-memory ray tracing, including the GraviT and Galaxy ray tracing frameworks, which enable photo-realistic rendering of the largest datasets produced on supercomputers today. His team provisions TACC’s two visualization labs and the remote visual analytic environments on TACC’s advanced computing systems, including the US NSF leadership-class systems Stampede2 and Frontera. Dr. Navrátil’s work has been featured in numerous venues, both nationally and internationally, including the New York Times, Discover, and PBS News Hour. He holds BS, MS and Ph.D. degrees in Computer Science and a BA degree in Plan II Interdisciplinary Honors from the University of Texas at Austin.
Invited Talk: Capstone

Visualization is Not Enough

Jeffrey Heer

Abstract

We are witnessing both increased application and public skepticism of data-driven methods for decision making and automation. Within this regime, data visualization — as a technology — seems well-poised to provide valuable insight and oversight. Though arguably a *necessary* component in the appropriate use of data, visualization by itself is far from *sufficient*. Data visualization — as a community of practice — sits at the confluence of many “source” disciplines, including cartography, computer science, graphic design, psychology, and statistics. The practice of principled interdisciplinary thinking is perhaps our greatest asset, suggesting avenues for our community to have outsized, beneficial impact in the world. In this talk I will consider the obvious yet potentially contrarian view that *visualization is not enough* — and why this realization is liberating for both research and practice. I will point to vanguards and future prospects in “visualization” research that I believe exemplify real-world relevance and require rich intellectual integration: accessibility, interactive visualization systems, reasoning under uncertainty, and interactions with machine learning models. One guiding heuristic we might consider is the degree to which we not only benefit from, but successfully contribute back to, the adjacent disciplines that fuel our endeavors. Our community is uniquely positioned to contribute to issues of critical importance to society. Let’s consider how we should rise to the challenge!

Short Biography

Jeffrey Heer is a Professor of Computer Science & Engineering at the University of Washington, where he directs the Interactive Data Lab and conducts research on data visualization, human-computer interaction and social computing. The visualization tools developed by Jeff and his collaborators (Vega, D3.js, Protovis, Prefuse) are used by researchers, companies, and data enthusiasts around the world. Jeff’s research papers have received awards at the premier venues in Human-Computer Interaction and Visualization (ACM CHI, UIST, CSCW, IEEE InfoVis, VAST, EuroVis). Honors include MIT Technology Review’s TR35 (2009), a Sloan Fellowship (2012), an Allen Distinguished Investigator Award (2014), a Moore Foundation Data-Driven Discovery Investigator Award (2014), the ACM Grace Murray Hopper Award (2016), and the IEEE Visualization Technical Achievement Award (2017). Jeff received B.S., M.S., and Ph.D. degrees in Computer Science from UC Berkeley, whom he then “betrayed” to join the Stanford faculty (2009–2013). He is also a co-founder of Trifacta, a provider of interactive tools for scalable data transformation.