Zhicheng Liu

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Employment

Assistant Professor	**University of Maryland College Park** Department of Computer Science	2020-present
Research Scientist	**Adobe Research** Creative Intelligence Lab	2013-2020
Postdoctoral Fellow	**Stanford University** Department of Computer Science	2012-2013

Education

Ph.D. in Human-Centered Computing *2012*
Georgia Institute of Technology

Bachelor of Computing (Honors), Computer Science *2006*
National University of Singapore

Teaching Experience

Instructor	**Information Visualization (CMSC734)** University of Maryland, graduate-level CS course	*Fall 2020, Fall 2021, Fall 2022, Fall 2023*
Instructor	**Introduction to Data Visualization (CMSC471)** University of Maryland, undergraduate-level CS course	*Spring 2022, Spring 2023*

Advising and Mentorship

Current PhD students

Chen Chen, UMD CS

Yuexi Chen, UMD CS

Kazi Tasnim Zinat, UMD CS

Hannah Bako, UMD CS

Sneha Gathani, UMD CS

PhD Thesis Committee

Eleftheria Briakou (UMD CS, 2023)
Jonggi Hong (UMD CS, 2021)
Pedro Alejandro Rodriguez (UMD CS, 2021)
Brian Ondov (UMD CS, 2021)
John Thompson (Georgia Tech CS, 2020)
Sanorita Dey (UIUC CS, 2020)
Hidy Kong (UIUC CS, 2019)
Nam Wook Kim (Harvard CS, 2019)

Honors and Awards

NSF CAREER Award *2023*
CISE IIS: "Manipulable Semantic Components in Data Visualization Design"

Best Paper Award *2020*
ACM SIGCHI Conference on Human Factors in Computing Systems

Best Paper Award *2018*
ACM SIGCHI Conference on Human Factors in Computing Systems

10 Year Test of Time Award *2017*
IEEE Visual Analytics Science and Technology (VAST)

Kantar Information is Beautiful Award, Short List *2017*
Data-Driven Guides (J.13), intern Nam Wook Kim won Rising Star Bronze Award

Top 10 Technical Session *2017*
Adobe Tech Summit (17% acceptance rate)

Top 3 Poster *2017*
Adobe Tech Summit (out of 1250 submissions)

Honorable Mention Best Paper *2015*
ACM SIGCHI Conference on Human Factors in Computing Systems

Doctoral Dissertation Award Honorable Mention (2nd Place) *2013*
IEEE Visualization and Graphics Technical Committee Pioneer Group

Doctoral Dissertation Award *2012*
College of Computing, Georgia Institute of Technology

Foley Scholar *2011*
Highest academic honor awarded by GVU Center, Georgia Tech

Honorable Mention Best Paper *2011*
IEEE Visual Analytics Science and Technology (VAST)

Award Recipient *2010,2011*
IEEE VAST Challenge

Honorable Mention Best Paper *2009*
IEEE Information Visualization Conference 2009

Winning Team, IEEE VAST Contest *2007*
University Category

Dr. Goh Keng Swee Scholarship *2002 – 2006*
Awarded to 3 or 4 students in Asia annually

Funding

NSF	CAREER: Manipulable Semantic Components in Data Visualization Design. Sole PI. $599,518. NSF-IIS-2239130.	*2023-2028*
Adobe Inc.	Unrestricted gift. $128,000.	*2020-2023*
Sigma Computing	Unrestricted gift. $10,000.	*2022*
Travelport Corp.	Unrestricted gift. $7,000.	*2008*

Services / Professional Activities

Editorial Activities

Associate Editor, *IEEE Transactions on Visualization and Computer Graphics* *2023-*

Program Committee

ACM Human Factors in Computing Systems (CHI)	*2016, 2018, 2024*
IEEE Visualization and Visual Analytics (VIS)	*2022-2023*
IEEE Information Visualization (InfoVis)	*2014-16, 2018-19*
IEEE Visual Analytics Science and Technology (VAST)	*2012-14, 2016-18, 2020*
EG/VGTC Conference on Visualization (EuroVis)	*2016, 2018, 2019, 2020*
Graphics Interfaces (GI)	*2021*
IEEE Pacific Visualization (PacificVis)	*2021*
ACM Creativity and Cognition (C&C)	*2019*
Visualization in Data Science Symposium (VDS)	*2018*
IEEE Symposium on Large Data Analysis and Visualization (LDAV)	*2018-2020*
Intl Workshop on Big Data Visual Exploration & Analytics (BigVis)	*2019*
China Visualization and Visual Analytics Conference (ChinaVis)	*2015*
International Conference on Intelligent User Interfaces (IUI)	*2013*
KDD Workshop on Interactive Data Exploration and Analytics (IDEA)	*2013-2016*

Organizing Committee

Paper Chair	International Symposium on Visual Computing	*2023*
Publications Chair	IEEE VIS	*2023-2024*
VIS in Practice Chair	IEEE VIS in Practice	*2020-2022*
Poster Chair	ACM IUI	*2019*
Best Poster Committee	IEEE InfoVis	*2018*
Fast Forward/Video Preview Chair	IEEE VIS	*2017-2019*
Paper Chair	ChinaVis	*2019-2020*
Poster Chair	ChinaVis	*2017-2018*
Organizer	SDM Workshop on Exploratory Data Analysis	*2014*
Compass Chair	IEEE VIS	*2013*

Proposal Review

Dutch Research Council	*2022*
Nation Science Foundation, IIS Division	*2019*
National Science Foundation Panelist, IIS Division	*2014*

Conference Review

ACM Human Factors in Computing Systems (CHI)	*2010-2022*
ACM Graphics and Interactive Techniques (SIGGRAPH)	*2014,2021*
ACM User Interface Software and Technology (UIST)	*2014-2015,2019-2022*
IEEE Information Visualization (InfoVis)	*2009-2020*
IEEE Visual Analytics Science and Technology (VAST)	*2009-2020*
ACM Computer-Supported Cooperative Work & Social Computing (CSCW)	*2023*
IEEE VAST Challenge	*2009, 2012, 2013*
IEEE Pacific Visualization (PacificVis)	*2011-2013, 2015, 2016*
IEEE Eurographics Conference on Visualization (EuroVis)	*2012,2015-2020*
International Conference on Computers in Education (ICCE)	*2010*
International Conference on Intelligent User Interfaces (IUI)	*2013*

Journal Review

ACM Transactions on Computer-Human Interaction (TOCHI)	*2010*
ACM Transactions on Intelligent Systems and Technology (TIST)	*2012*
ACM Transactions on Interactive Intelligent Systems (TIIS)	*2012*
Health Informatics Journal	*2011-2012*
IEEE Transactions on Visualization and Computer Graphics (TVCG)	*2011-2013, 2015-2022*
Information Visualization Journal (IVS)	*2011*
International Journal of HCI (IJHCI)	*2010, 2012-2014*

Publications

Journal Articles

J.24 C. Chen, B. Lee, Y. Wang, Y. Chang, Z. Liu. "Mystique: Deconstructing SVG Charts for Layout Reuse". *IEEE Transactions on Visualization & Computer Graphics (Proceedings IEEE VIS, acceptance rate: 24.7%*), 2023.

J.23 C. Chen, Z. Liu. "The State of the Art in Creating Visualization Corpora for Automated Chart Analysis". *Computer Graphics Forum (Proceedings of EuroVis),* 42(3), 2023.

J.22 K. T. Zinat, J. Yang, A. Gandhi, N. Mitra, Z. Liu. "A Comparative Evaluation of Visual Summarization Techniques for Event Sequences". *Computer Graphics Forum (Proceedings of EuroVis, acceptance rate: 27%)*, 42(3), 2023.

J.21 H. K. Bako, X. Liu, L. Battle, Z. Liu. "Understanding how Designers Find and Use Data Visualization Examples". IEEE Transactions on Visualization & Computer Graphics (*Proceedings IEEE VIS, acceptance rate: 26.5%*), 2022.

J.20 J. Thompson, Z. Liu, W. Li, J. Stasko, "Understanding the Design Space and Authoring Paradigms for Animated Data Graphics", *Computer Graphics Forum (Proceedings of EuroVis)*, 39(3), 2020.

J.19 A. Satyanarayan, B. Lee, D. Ren, J. Heer, J. Stasko, J. Thompson, M. Brehmer, Z. Liu. "Critical Reflections on Visualization Authoring Systems". *IEEE Transactions on Visualization and Computer Graphics (Proceedings IEEE InfoVis'19*, *acceptance rate:25.8%)*, 26 (1), 2020.

J.18 S. K. Badam, Z. Liu, N. Elmqvist. "Elastic Documents: Coupling Text and Tables through Contextual Visualizations for Enhanced Document Reading". *IEEE Transactions on Visualization and Computer Graphics (Proceedings IEEE InfoVis''18*, *acceptance rate:25.1%)*, 25 (1), 2019.

J.17 P. Law, Z. Liu, S. Malik, R. Basole. "MAQUI: Interweaving Queries and Pattern Mining for Recursive Event Sequence Exploration." *IEEE Transactions on Visualization and Computer Graphics (Proceedings IEEE VAST'18, acceptance rate: 29.3%),* 25 (1), 2019.

J.16 J. Choo, H. Kim, E. Clarkson, Z. Liu, C. Lee, F. Li, H. Lee, R. Kannan, C. Stolper, J. Stasko, H. Park. "VisIRR: A Visual Analytics System for Information Retrieval and Recommendation for Large-Scale Document Data", *ACM Transactions on Knowledge Discovery from Data*, 12 (1), 2018.

J.15 H. Kong, Z. Liu, and K. Karahalios. "Internal and External Visual Cue Preferences for Visualizations in Presentations", *Computer Graphics Forum (Proceedings EuroVis '17, acceptance rate: 27%)*, 36 (3), 2017.

J.14 Z. Liu, B. Kerr, M. Dontcheva, J. Grover, M. Hoffman, and A. Wilson. "CoreFlow: Extracting and Visualizing Branching Patterns from Event Sequences", *Computer Graphics Forum (Proceedings EuroVis '17, acceptance rate: 27%)*, 36 (3), 2017.

J.13 N. Kim, E. Schweickart, Z. Liu, M. Dontcheva, W. Li, J. Popovic, and H. Pfister, "Data-Driven Guides: Supporting Expressive Design for Information Graphics", *IEEE Transactions on Visualization and Computer Graphics (Proceedings InfoVis '16, acceptance rate: 22%)*, 23 (1), 2017.

J.12 Z. Liu, Y. Wang, M. Dontcheva, M. Hoffiman, S. Walker and A. Wilson, "Patterns and Sequences: Interactive Exploration of Clickstreams to Understand Common Visitor Paths", *IEEE Transactions on Visualization and Computer Graphics (Proceedings VAST '16, acceptance rate: 21%)*, 23 (1), 2017.

J.11 Z. Liu and J. Heer, "The Effects of Interactive Latency on Exploratory Visual Analysis", *IEEE Transactions on Visualization and Computer Graphics (Proceedings InfoVis '14, acceptance rate: 23%)*, 20 (12), 2014.

J.10 Z. Liu, B. Jiang and J. Heer, "imMens: Enabling Real-time Visual Querying of Big Data", *Computer Graphics Forum* (*Proc. EuroVis, acceptance rate: 27.7%*), 32 (3), 2013.

J.9 Z. Liu, S. Navathe and J. Stasko. "Ploceus: Modeling, Visualizing and Analyzing Tabular Data as Networks", *Information Visualization*, 13 (1), 2013.

J.8 C. Görg, Z. Liu, and J. Stasko, "Reflections on the Evolution of the Jigsaw Visual Analytics System", *Information Visualization*, 13 (4), 2013.

J.7 C Görg, Z. Liu, J. Kihm, J. Choo, H. Park and J. Stasko. "Combining Computational Analyses and Interactive Visualization for Document Exploration and Sensemaking in Jigsaw", *IEEE Transactions on Visualization and Computer Graphics*, 19 (10), 2013.

J.6 C Görg, Y. Kang, Z. Liu, J. Stasko. "Visual Analytics Support for Intelligence Analysis", *Computer*, 46 (7), pp. 30-38, 2013

J.5 Z. Liu and J. Stasko, "Mental Models, Visual Reasoning and Interaction in Information Visualization: A Top-down Perspective", *IEEE Transactions on Visualization and Computer Graphics (Proceedings InfoVis '10, acceptance rate: 26%)*, 16 (6), 2010.

J.4 Z. Liu, J. Stasko and T. Sullivan. "SellTrend: Inter-Attribute Visual Analysis of Temporal Transaction Data", *IEEE Transactions on Visualization and Computer Graphics* (*Proceedings InfoVis '09, acceptance rate: 26%*), 15 (6), 2009. **Honorable Mention Best Paper**

J.3 Z. Liu, N. Nersessian, and J. Stasko, "Distributed Cognition as a Theoretical Framework for Information Visualization", *IEEE Transactions on Visualization and Computer Graphics (Proceedings InfoVis '08, acceptance rate: 26%*), 14 (6), 2008.

J.2 J. Stasko, C. Görg, and Z. Liu, "Jigsaw: Supporting Investigative Analysis through Interactive Visualization", *Information Visualization*, 7 (2), 2008.

J.1 C. Plaisant, G. G. Grinstein, J. Scholtz, M. Whiting, T. O'Connell, S. J. Laskowski, L. Chien, A. Tat, W. Wright, C. Görg, Z. Liu, N. Parekh, K. Singhal, and J. T. Stasko, "Evaluating Visual Analytics at the 2007 VAST Symposium Contest", *IEEE Computer Graphics and Applications*, 28 (2), 2008.

Conference Papers

C.22 Y. Chen, Z. Liu, C. Tensmeyer, N. Elmqvist, V. Morariu. "DocDancer: Authoring Ultra-responsive Documents with Layout Generation". *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, 2023.

C.21 C. Chen, J. Hoffswell, S. Guo, R. Rossi, Y. Chan, F. Du, E. Koh, Z. Liu. "WhatsNext: Guidance-enriched Exploratory Data Analysis with Interactive, Low-Code Notebooks". *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, 2023.

C.20 Z. Liu, C. Chen, F. Morales, Y. Zhao. "Atlas: Grammar-based Procedural Generation of Data Visualizations". *IEEE VIS Short Papers* 2021 (acceptance rate: 29%).

C.19 J. Thompson, Z. Liu, J. Stasko, "Data Animator: Authoring Expressive Animated Data Graphics", *SIGCHI Conference on Human Factors in Computing Systems*, 2021 (acceptance rate: 26.3%)

C.18 N. Sultanum, F. Chevalier, Z. Bylinskii, Z. Liu, "VizFlow: Leveraging Text-Chart Links to Support Authoring of Data-Driven Articles", *SIGCHI Conference on Human Factors in Computing Systems*, 2021 (acceptance rate: 26.3%)

C.17 F. Du, S. Guo, S. Malik, E. Koh, S. Kim, Z. Liu. "Interactive event sequence prediction for marketing analysts". *Extended Abstracts of the SIGCHI Conference on Human Factors in Computing Systems*. 2020.

C.16 Z. Liu, Z. Liu, T. Munzner, "Data-Driven Multi-level Segmentation of Image Editing Logs", *SIGCHI Conference on Human Factors in Computing Systems*, 2020 (acceptance rate: 24.3%)

C.15 J. Hoffswell, W. Li, Z. Liu, "Techniques for Flexible Responsive Visualization Design", *SIGCHI Conference on Human Factors in Computing Systems*, 2020 (acceptance rate: 24.3%) **Best Paper Award**

C.14 J. Hoffswell, Z. Liu, "Interactive Repair of Tables Extracted from PDF Documents on Mobile Devices", *SIGCHI Conference on Human Factors in Computing Systems*, 2019 (acceptance rate: 23.8%).

C.13 H. Kong, Z. Liu, K. Karahalios, "Trust and Recall of Information across Varying Degrees of Title-Visualization Misalignment", *SIGCHI Conference on Human Factors in Computing Systems*, 2019. (acceptance rate: 23.8%)

C.12 H. Kong, W. Zhu, Z. Liu, K. Karahalios, "Understanding Visual Cues in Visualizations Accompanied by Audio Narrations", *SIGCHI Conference on Human Factors in Computing*

Systems, 2019. (acceptance rate: 23.8%)

C.11 S. Guo, F. Du, S. Malik, E. Koh, S. Kim, Z. Liu, D. Kim, H. Zha, N. Cao. "Visualizing Uncertainty and Alternatives in Event Sequence Predictions", *SIGCHI Conference on Human Factors in Computing Systems*, 2019. (acceptance rate: 23.8%)

C.10 Z. Liu, J. Thompson, A. Wilson, M. Dontcheva, J. Delorey, S. Grigg, B. Kerr and J. Stasko. "Data Illustrator: Augmenting Vector Design Tools with Lazy Data Binding for Expressive Visualization Authoring", *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* 2018. (acceptance rate: 25.7%) **Best Paper Award**.

C.9 H. Kong, Z. Liu and K. Karahalios. "Frames and Slants in Titles of Visualizations on Controversial Topics", *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* 2018. (acceptance rate: 25.7%)

C.8 H. Dev and Z. Liu, "Identifying Frequent User Tasks from Application Logs", *Proceedings of the 22nd International Conference on Intelligent User Interfaces (IUI),* 2017. (acceptance rate: 23%)

C.7 T. Gao, M. Dontcheva, E. Adar, Z. Liu and K. Karahalios, "DataTone: Managing Ambiguity in Natural Language Interfaces for Data Visualization", *Proceedings of 28th ACM Symposium on User Interface Software and Technology (UIST)*, 2015. (acceptance rate: 24%)

C.6 B. Saleh, M. Dontcheva, A. Hertzmann, Z. Liu, "Learning Style Similarity for Searching Infographics", *Proceedings of the 41st Graphics Interface Conference*, 2015. (acceptance rate: 38.5%)

C.5 J. Zhao, Z. Liu, M. Dontcheva, A. Hertzmann and A. Wilson, "MatrixWave: Visual Comparison of Event Sequence Data", *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Apr 2015. (acceptance rate: 25%) **Honorable Mention Best Paper**

C.4 J. Choo, H. Lee, Z. Liu, J. Stasko and H. Park, "An Interactive Visual Testbed System of Dimension Reduction and Clustering for Large-scale High-dimensional Data", *Proc. Visualization and Data Analysis*, 2013.

C.3 Z. Liu, S. Navathe and J. Stasko, "Network-based Visual Analysis of Tabular Data", *Proc. IEEE Visual Analytics Science & Technology (VAST)*, 2011. (acceptance rate: 32.5%) **Honorable Mention Best Paper**

C.2 Z. Liu, B. Lee, S. Kandula and R. Mahajan, "NetClinic: Interactive Visualization to Enhance Automated Fault Diagnosis in Enterprise Networks", *Proc. IEEE Visual Analytics Science & Technology (VAST)*, 2010. (acceptance rate: 27.7%)

C.1 J. Stasko, C. Görg, Z. Liu and K. Singhal, "Jigsaw: Supporting Investigative Analysis through Interactive Visualization", *Proc. IEEE Visual Analytics Science & Technology (VAST)*, 2007. (acceptance rate: 42%) **IEEE VAST 10 Year Test of Time Award**.

Workshop Papers

W.5 Z. Liu, H. Dev, M. Dontcheva, and M. Hoffman. "Mining, Pruning and Visualizaing Frequent Patterns for Temporal Event Sequence Analysis", *IEEE VIS 2016 Workshop on Temporal & Sequential Event Analysis*, 2016

W.4 Z. Liu and J. Stasko, "Theories in Information Visualization: What, Why and How", Workshop on the Role of Theory in Information Visualization, 2010.

W.3 C. Görg, J. Kihm, J. Choo, Z. Liu, S. Muthiah, H. Park, and J. Stasko, "Combining Computational Analyses and Interactive Visualization to Enhance Information Retrieval", 4th Workshop on Human-Computer Interaction and Information Retrieval, 2010.

W.2 Z. Liu, S. Yardi, and J. Stasko, "Do you know what you did last summer? Visualizing personal behavior in Google", *CHI '10 Personal Informatics Workshop*, 2010.

W.1 J. Stasko, C. Görg, and Z. Liu, "Sensemaking across Text Documents: Human-Centered Visual Exploration with Jigsaw", *CHI '08 Workshop on Sensemaking*, 2008.

Dissertation

D.1 Z. Liu. "Network-Based Visual analysis of Tabular Data", Doctoral Dissertation, Georgia Institute of Technology, May 2012. **Doctoral Dissertation Award, College of Computing, Georgia Tech**

Posters and Contest Papers

P.6 J. Choo, C. Lee, H. Kim, H. Lee, Z. Liu, R. Kannan, C. Stolper, J. Stasko, B. Drake, H. Park. "VisIRR: Visual Analytics for Information Retrieval and Recommendation with Large-Scale Document Data", *Proceedings of IEEE VAST (Poster),* 2014.

P.5 Z. Liu, C. Görg, J. Kihm, H. Lee, J. Choo, H. Park, J. Stasko, "Data Ingestion and Evidence Marshalling in Jigsaw. VAST 2010 Mini Challenge 1 Award: Good Support for Data Ingest", *Proc. IEEE Visual Analytics Science & Technology (VAST)*, 2010.

P.4 H. Lee, J. Choo, C. Görg, J. Shim, J. Kihm, Z. Liu, H. Park, J. Stasko, "GeneTracer: Gene Sequence Analysis of Disease Mutations. VAST 2010 Mini Challenge 3 Award: Excellent Process Explanation", *Proc. IEEE Visual Analytics Science & Technology (VAST)*, 2010

P.3 C. Görg, Z. Liu, N. Parekh, K. Singhal, and J. Stasko, "Jigsaw meets Blue Iguanodon – The VAST 2007 Contest", *Proc. IEEE Visual Analytics Science & Technology (VAST),* 2007

P.2 C. Görg, Z. Liu, N. Parekh, K. Singhal, and J. Stasko, "Visual Analytics with Jigsaw, *IEEE*

VAST '07, Sacramento, CA, October 2007.

P.1 Z. Liu and J. Stasko, "Jigsaw: Facilitating Investigative Analysis Through Visualization", *Annual DHS University Network Summit on Research and Education*, March 2007.

Invited Keynotes

Towards Scalable and Interpretable Visual Analytics
Keynote at the Visualization in Data Science Workshop at ACM KDD *Aug 2022*

Invited Talks

Human-Machine Symbiosis in Data Visualization
Stanford University HCI Seminar, *Palo Alto, CA* *Oct 2023*
Virginia Tech, *Falls Church, VA* *Sep 2023*
Human Factors and Ergonomics Society Webinar *Aug 2023*
MIT CSAIL HCI Seminar, *Cambridge, MA* *Apr 2023*

Towards Scalable and Interpretable Visual Analytics
Snap Applied Research, *Los Angeles, CA* *Nov 2022*

Visual Analytics of Event Sequence Data
Amazon AWS ML Solutions Lab, *Santa Clara, CA* *May 2022*
Columbia University, *New York City, NY* *Nov 2021*

Scalable Visualization Systems for Broad Audiences
Sigma Computing, *San Francisco, CA* *Aug 2021*

Towards a Grammar of Animated Data Graphics
HCIL Brown Bag Lunch Speaker, *College Park, MD* *Oct 2020*

How to Describe a Visualization (and Create Expressive Visualizations with Ease)
University of British Columbia, *Vancouver, BC* *Feb 2019*
University of Illinois, *Urbana-Champaign, IL* *Apr 2019*

Data Visualization Tools for the Masses
University of California, *Riverside, CA* *Feb 2019*

Visualization Design Tools for Storytelling
University of Maryland, *College Park, MD* *Dec 2018*

Temporal Event Sequence Visualization and Analysis *Feb 2017*

University of California Davis, *Davis, CA*

Designing Human-Centered Tools for Data Analysis and Communication
Peking University, *Beijing, China* *Oct 2016*

imMens: Enabling Real-time Visual Querying of Big Data
Joint Statistical Meetings, *Chicago, IL* *Aug 2016*

Designing Human-Centered Tools for Data Analysis and Communication
Berkeley Institute of Design, *Berkeley, CA* *Apr 2016*

Human-Centered Data Analysis and Visualization
Brown University, *Providence, Rhode Island* *Mar 2016*

Data Illustrator: Advanced Data Vis Authoring Without Code
Adobe XD Design Week Show & Tell, *Herbst Theatre, San Francisco, CA* *Jan 2016*

Interactive Latency in Big Data Visualization
Big Data Visualization - South Bay Meetup, *CA Technologies, Santa Clara, CA* *Jan 2014*

Designing and Engineering Visual Analytics
GE Global Research, *San Ramon, CA* *Jul 2013*

Enabling Data Enthusiasts: Visual Analysis Tools for Big Data
Adobe Research, Creative Technologies Lab, *San Francisco, CA* *Feb 2013*
Cornell University, *Ithaca, NY* *Mar 2013*
Purdue University, *West Lafayette, IN* *Mar 2013*
Simon Fraser University, *Surrey, BC, Canada* *Apr 2013*
University of Utah, *Salt Lake City, UT* *Apr 2013*

***imMens*: Enabling Real-time Visual Querying of Big Data**
IBM Almaden Research Center, *San Jose, CA* *Jan 2013*

Supporting Visualization Creation: Tables, Networks and Beyond
GVU Seminar, Georgia Institute of Technology, *Atlanta, GA* *Mar 2012*

Network-based Visual Analysis of Tabular Data
Tableau Software, *Seattle, WA* *Dec 2011*

Patents

Interactive visualization to enhance automated fault diagnosis in networks *US Patent 9,083,560*

Providing visualizations of event sequence data *US Patent 9,577,897*

Generating graphical depictions of data sets based on mapping paths of graphical objects to data properties *US Patent 10,096,139*

Clickstream visual analytics based on maximal sequential patterns *US Patent 10,148,776*

Interactive scene graph manipulation for visualization authoring *US Patent 10,290,128*

Extracting and visualizing branching patterns from temporal event sequences	*US Patent 10,466,869*
Dynamic digital document visual aids in a digital medium environment	*US Patent 10,902,192*
Systems for generating interactive reports	*US Patent App. 17/474,188*
Responsive document authoring	*US Patent App. 17/535,067*