Shusen Liu

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Education

2016   Ph.D. Computing, University of Utah.

2009   B.E. Biomedical Engineering, Huazhong University of Science and Technology (China), 2009.

2009   B.S. Computer Science, Huazhong University of Science and Technology (China), 2009.

Professional Employment

Feb-2017 - Present	Postdoctoral Researcher, Lawrence Livermore National Laboratory
Aug-2010 - Dec-2016	Research Assistant, Scientific Computing and Imaging Institute, University of Utah
Jun-2014 - Aug-2014	Research Aide Intern, Lawrence Livermore National Laboratory, Livermore, CA
May-2013 - Aug-2013	Research Aide Intern, Lawrence Livermore National Laboratory, Livermore, CA
May-2012 - Aug-2012	Research Aide Intern, Argonne National Laboratory, Lemont, IL
May-2011 - Aug-2011	Research Aide Intern, Argonne National Laboratory, Lemont, IL

Research

Journal Publications

[J1] NLIZE: A Perturbation-Driven Visual Interrogation Tool for Analyzing and Interpreting Natural Language Inference Models.
Shusen Liu, Zhimin Li, Tao Li, Vivek Srikumar, Valerio Pascucci and Peer-Timo Bremer. *IEEE Transactions on Visualization and Computer Graphics (InfoVis 2018), 25(1), 651-660*, 2019

[J2] Exploring High-Dimensional Structure via Axis-Aligned Decomposition of Linear Projections.
Jayaraman J. Thiagarajan, Shusen Liu, Karthikeyan Natesan Ramamurthy and Peer-Timo Bremer. *Computer Graphics Forum 37 (3), 241-251*, 2018

[J3] Visual Exploration of Semantic Relationships in Neural Word Embeddings.
<u>Shusen Liu</u>, Peer-Timo Bremer, Jayaraman J. Thiagarajan, Vivek Srikumar, Bei Wang, Yarden Livnat and Valerio Pascucci. *IEEE Transactions on Visualization and Computer Graphics (InfoVis 2017), 24(1), 553-562*, 2018

[J4] Visualizing High-Dimensional Data: Advances in the Past Decade.
<u>Shusen Liu</u>, Dan Maljovec, Bei Wang, Peer-Timo Bremer and Valerio Pascucci. *IEEE Transactions on Visualization and Computer Graphics 23 (3), 1249-1268*, 2017

[J5] The Grassmannian Atlas: A General Framework for Exploring Linear Projections of High-Dimensional Data.
<u>Shusen Liu</u>, Peer-Timo Bremer, Jayaraman J. Thiagarajan, Bei Wang, Brian Summa and Valerio Pascucci. *Computer Graphics Forum (CGF)*, 2016

[J6] Visual Exploration of High-Dimensional Data through Subspace Analysis and Dynamic Projections.
<u>Shusen Liu</u>, Bei Wang, Jayaraman J. Thiagarajan, Peer-Timo Bremer and Valerio Pascucci. *Computer Graphics Forum (CGF)*, 34(3), 271-280, 2015

[J7] Analyzing Simulation-Based PRA Data Through Traditional and Topological Clustering: A BWR Station Blackout Case Study.
Dan Maljovec, <u>Shusen Liu</u>, Bei Wang, Valerio Pascucci, Peer-Timo Bremer, Diego Mandelli and Curtis Smith. *Reliability Engineering & System Safety (RESS)*, 2015

[J8] Distortion Guided Structure-Driven Interactive Data Exploration.
<u>Shusen Liu</u>, Bei Wang, Peer-Timo Bremer and Valerio Pascucci.
Computer Graphics Forum(CGF), 33 (3), 101-110, 2014.

[J9] CT based computerized identification and analysis of human airways: A review.
Jiantao Pu, Suicheng Gu, <u>Shusen Liu</u>, Shaocheng Zhu, David Wilson, Jill M. Siegfried and David Gur. *Medical Physics*, 39(5), 2603-2616, 2012.

[J10] Feature-Based Statistical Analysis of Combustion Simulation Data.
Janine C. Bennett, Vaidyanathan Krishnamoorthy, <u>Shusen Liu</u>, Ray W. Grout, Evatt R. Hawkes, Jacqueline H. Chen, Jason Shepherd, Valerio Pascucci and Peer-Timo Bremer. *IEEE Transaction on Computer Graphics and Visualization*, 17(12), 1822-1831, 2011.

[J11] Fast Blood Flow Visualization of High-Resolution Laser Speckle Imaging Data Using Graphics Processing Unit.
<u>Shusen Liu</u>, Pengcheng Li and Qingming Luo.
Optics Express, Vol.16, Issue 19, 2008.

Peer-Reviewed Conference Publications

[C1] Visual Interrogation of Attention-Based Models for Natural Language Inference and Machine Comprehension.

Shusen Liu, Tao, Li, Zhimin Li, Vivek Srikumar, Valerio Pascucci, and Peer-Timo Bremer . *Conference on Empirical Methods in Natural Language Processing (EMNLP) Demonstration Track*, 2018.

[C2] Embedded Domain-Specific Language and Runtime System for Progressive Spatiotemporal Data Analysis and Visualization.
Cameron Christensen, Shusen Liu, Giorgio Scorzelli, Ji-Woo Lee, Peer-Timo Bremer and Valerio Pascucci. *IEEE Symposium on Large Data Analysis and Visualization (LDAV)*, 2016.

[C3] Visualizing High-Dimensional Data: Advances in the Past Decade.
Shusen Liu, Dan Maljovec, Bei Wang, Peer-Timo Bremer and Valerio Pascucci.
The Eurographics Conference on Visualizaiton (EuroVis15), State-of-The-Art Reports (STARS), 2015.

[C4] Multivariate Volume Visualization through Dynamic Projections.
Shusen Liu, Bei Wang, Jayaraman J. Thiagarajan, Peer-Timo Bremer and Valerio Pascucci.
IEEE Symposium on Large Data Analysis and Visualization (LDAV), 2014.

[C5] Analyzing Simulation-Based PRA Data Through Clustering: a BWR Station Blackout Case Study.
Dan Maljovec, Shusen Liu, Bei Wang, Valerio Pascucci, Peer-Timo Bremer, Diego Mandelli and Curtis Smith. *International Conference on Probabilistic Safety Assessment and Management (PSAM)*, 2014.

[C6] Gaussian Mixture Model Based Volume Rendering.
Shusen Liu, Joshua A. Levine, Peer-Timo Bremer and Valerio Pascucci.
IEEE Symposium on Large-Scale Data Analysis and Visualization (Best paper award), 2012.

Workshop / Poster Publications

[W1] Topology-Driven Analysis and Exploration of High-Dimensional Models (Workshop)
Shusen Liu, Kelli Humbird, Luc Peterson, Jayaraman Thiagarajan, Brian Spears, Peer-Timo Bremer
Workshop on Research Challenges and Opportunities at the interface of Machine Learning and Uncertainty Quantification, 2018

[W2] A Static Load Balancing Scheme for Parallel Volume Rendering on Multi-GPU Clusters (Poster)
Shusen Liu, Venkatram Vishwanath, Joseph Insley, Mark Hereld, Michael E. Papka, Valerio Pascucci.
IEEE Symposium on Large-Scale Data Analysis and Visualization (LDAV), 2012

[W3] Evaluating graph coloring on GPUs (Poster)
Pascal Grosset, Peihong Zhu, Shusen Liu, Suresh Venkatasubramanian, Mary W. Hall.
ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, 2011

Selected Talks

NLIZE: A Perturbation-Driven Visual Interrogation Tool for Analyzing and Interpreting Natural Language Inference Models,
IEEE Conference on Visualization (InfoVis), 2018.

Visual Exploration of Latent Spaces in Deep Neural Network Models,
Inaugural Data Science Institute Workshop, Lawrence Livermore National Laboratory, 2018.

The Tale of "Clever Hans" and Learning Model Interpretability,
Research Slam at Lawrence Livermore National Laboratory, 2018

Visual Exploration of Semantic Relationships in Neural Word Embeddings,
IEEE Conference on Visualization (InfoVis), 2017.

Understanding High-Dimensional Spaces Through the Identification, Summarization and Interpretation of 2D Projections,
Invited Seminar, Lawrence Livermore National Laboratory, 2016.

Grassmannian Atlas: A General Framework for Exploring Projections of High-Dimensional Data,
Eurographics Conference on Visualization (EuroVis), 2016.

Visualizing High-Dimensional Data: Advances in the Past Decade,
Eurographics Conference on Visualization (EuroVis) State-of-the-Art Report, 2015.

What, Why, and How of Visualizing High-Dimensional Dataset,
University of Utah, Special Topics in Statistics Class Guest Lecture, 2014.

Multivariate Volume Visualization through Dynamic Projections,
IEEE Symposium on Large-Scale Data Analysis and Visualization, 2014.

Distortion Guided Structure-Driven Interactive Data Exploration,
Eurographics Conference on Visualization (EuroVis), 2014.

Gaussian Mixture Model Based Volume Rendering,
IEEE Symposium on Large-Scale Data Analysis and Visualization, 2012.

Awards

2012 Large Data Analysis and Visualization (LDAV) Best Paper Award.

Teaching Experience

Teaching Assistant, University of Utah, Spring 2010, Introduction to Java Programming.

Teaching Assistant, University of Utah, Fall 2009, 3D Modeling.

Professional Service

Journal / Conference Reviewer

IEEE Conference on Visualization (VIS).

IEEE Pacific Visualization Symposium (PacificVis).

IEEE Transection on Graphics and Visualization (TVCG).

IEEE Symposium on Large Data Analysis and Visualization (LDAV).

ACM Conference on Human Factors in Computing Systems (CHI).

Eurographics Conference on Visualization (EuroVis).

Journal of Visualization

Computer Graphics Forum

Programming Committee Member

ISAV 2018: In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization, 2018.

References

Dr. Valerio Pascucci,
Professor at School of Computing University of Utah
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Dr. Peer-Timo Bremer,
Research Scientist at CASC Lawrence Livermore National Laboratory
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