Zhimin Li | Visualization, XAI, HPC

College of Engineering – Vanderbilt University

(+1) 8015583593 • ✉ lzm.zhimin@gmail.com • ☏ My Webpage

in Linkedin

Education

University of Utah
PhD, Computer Science   *2024*
Advisor: Valerio Pascucci

University of Utah
Bachelor of Computer Science   *2015*
Thesis: "G-MAP: A High Dimension Data Grand Tour Map"

University of Utah
Bachelor of Applied Math   *2015*

Research Experience

University of Vanderbilt

Postdoctoral Scholar   *Oct,2024 – present*
Applying machine learning and visualization for large-scale data management and analysis

University of Utah

Research Assistant   *2017 – 2024*
My research focus encompasses the fields of visualization, explainable AI, and high-performance computing. I am interested in designing novel data visualization techniques to assist researchers from various scientific domains in studying large datasets and complex computational models.

Lawrence Livermore National Laboratory

Apply Lossy Compression in Generative Model Training   *May 2023 Aug 2023*
Apply state-of-the-art lossy compression technique, ZFP, on generative model training for scientific simulation. The main goal is to reduce the size of training data (e.g,. 3.5TB->20GB) without affecting the performance of the generative model.

Model and Predict Silent Error Propagation   *May 2019 Aug 2019*
Apply visualization, machine learning, and data mining techniques to understand the impact of silent data corruption in high-performance computation. Design an efficient data analysis parallel solution to analyze large unstructured datasets.

Visualize Silent Error Propagation   *May 2018 Aug 2018*
Apply visualization techniques to understand the impact of silent data corruption in high-performance computation. Design efficient data visualization for the computation dependency graph to track the error propagation through program computation.

High Dimensional Data Visualization and Analysis   *May 2016 – Aug 2016*
Apply dimension reduction, clustering, and statistical approaches to understand the complex high-dimensional data. Design an interactive visualization system to help researchers explore high-dimensional data.

Publications

Journal Articles

2024: **Zhimin, Li**, Shusen Liu, Xin Yu, Kailkhura Bhavya, Jie Cao, Diffenderfer James Daniel, Peer-Timo Bremer, and Valerio Pascucci. "understanding robustness lottery": A geometric comparative visual analysis of neural network pruning approaches. ***IEEE Transactions on Visualization and Computer Graphics***, 2024.

2024: Shusen. Liu, Haichao. Miao, **Zhimin, Li**, M. Olson, V. Pascucci, and P-T. Bremer. Ava: Towards autonomous visualization agents through visual perception-driven decision-making. ***Computer Graphics Forum***, volume 43, page e15093, 2024.

2022: **Zhimin, Li**, Harshitha Menon, Kathryn Mohror, Shusen Liu, Luanzheng Guo, Peer-Timo Bremer, and Valerio Pascucci. A visual comparison of silent error propagation. ***IEEE Transactions on Visualization and Computer Graphics***, volume 30, pages 3268–3282, 2022.

2021: **Zhimin, Li**, Harshitha Menon, Dan Maljovec, Yarden Livnat, Shusen Liu, Kathryn Mohror, Peer-Timo Bremer, and Valerio Pascucci. Spotsdc: Revealing the silent data corruption propagation in high-performance computing systems. ***IEEE Transactions on Visualization and Computer Graphics***, volume 27, pages 3938–3952, 2021.

2019: Shusen Liu, **Zhimin, Li**, Tao Li, Vivek Srikumar, Valerio Pascucci, and Peer-Timo Bremer. Nlize: A perturbation-driven visual interrogation tool for analyzing and interpreting natural language inference models. ***IEEE Transactions on Visualization and Computer Graphics***, volume 25, pages 651–660, 2019.

Conference Proceedings

2021: **Zhimin, Li**, Harshitha Menon, Kathryn Mohror, Peer-Timo Bremer, Yarden Livant, and Valerio Pascucci. Understanding a program's resiliency through error propagation. In ***Proceedings of the 26th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming***, PPoPP '21, page 362–373, New York, NY, USA, 2021. Association for Computing Machinery.

2018: Shusen Liu, Tao Li, **Zhimin, Li**, Vivek Srikumar, Valerio Pascucci, and Peer-Timo Bremer. Visual interrogation of attention-based models for natural language inference and machine comprehension. In ***Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing: System Demonstrations***, pages 36–41, 2018.

2016: **Zhimin, Li**, Shusen Liu, and Valerio Pascucci. Grand-map: A high dimensional grand tour map. In *UROP, University of Utah*, 2016.

Preprint

2025: **Zhimin, Li**, Haichao Miao, Xinyuan Yan, Valeri Pascucci, Matthew Berger, and Shusen Liu. See or recall: A sanity check for the role of vision in solving visualization understanding tasks with multimodal llms. ***(Under Submission)***, 2025.

2025: **Zhimin, Li**, Harshitha Menon, Charles Fredrick Jekel, Peter Lindstrom, and Valerio Pascucci. Data reduction for generative surrogate model training. ***(LDAV under submission)***, 2025.

2025: **Zhimin, Li**, Joshua A. Levine, and Matt Berger. Training implicit neural field for scientific data through distribution prediction. ***(In Preparing)***, 2025.

2024: **Zhimin, Li**, Haichao Miao, Valerio Pascucci, and Shusen Liu. Visualization literacy of multimodal large language models: A comparative study. *arXiv preprint arXiv:2407.10996*, 2024.

2023: **Zhimin, Li**, Shusen Liu, Kailkhura Bhavya, Timo Bremer, and Valerio Pascucci. Instance-wise linearization of neural network for model interpretation. *arXiv preprint arXiv:2310.16295*, 2023.

Selected Extended Abstracts

2018: **Zhimin, Li**, Harshitha Menon, Kathryn Mohror, Yarden Livant, and Valerio Pascucci. an information visualization system to analyze silent data corruption. In *The International Conference for High Performance Computing, Networking, Storage, and Analysis*, SC ', 2018.

2016: **Zhimin, Li** and Alexander Lex. Why and when do students change majors? In *IEEE VIS*, demo, 2016.

Scholarships & Awards

2023: NSDF SC23 Travel Award
2022: IEEE E-science 18th Conference 2022 traveling scholarship
2015: KLW Artificial/Machine Learning scholarship
2015: C.M. Collins Endowed Scholarship

Computer skills

Programming Languages: Python, PyTorch, C, C++, JAVA
Web Technologies: HTML 5, CSS, D3.js, Javascript
Database: MySQL

Position of Responsibility

IEEE Transactions on Visualization and Computer Graphics Reviewer	*2025*
Computer Graphics Forum (CGF) Reviwer	*2025*
ISAV Program Committee	*2025*
IEEE VIS Reviewer	*2021-2025*
IEEE Pacific VIS Conference Track Reviewer	*2023-2024*
IEEE Pacific VIS TVCG Journal Track Reviewer	*2024-2025*
SC Reviewer	*2025*
IEEE VIS Volunteer	*2020*
ACM SIGMOD/PODS 2014 Volunteer	*2014*
Honorary national mathematics society *Member of Pi Mu Epsilon*	*2014*

Teaching Assistantship

CS6962 Programming For Engineer	**University of Utah** *Fall, 2018:*
CS6962 Programming For Engineer	**University of Utah** *Fall, 2017:*
CS4150 Algorithm	**University of Utah** *Spring, 2016:*
CS3100 Models Of Computation	**University of Utah** *Fall, 2015:*

References

Dr. Valerio Pascucci
Professor, Department of
Engineering, University of Utah
School of Computing
✉ pascucci@sci.utah.edu

Dr. Joshua A. Levine
Associate Professor
University of Arizona
Department of Computer Science
✉ josh@arizona.edu

Dr. Shusen Liu
Research Scientist
Lawrence Livermore National Laboratory
Center for Applied Scientific Computing
✉ liu42@llnl.gov

Dr. Peer-Timo Bremer
Research Scientist
Lawrence Livermore National Laboratory
Center for Applied Scientific Computing
✉ bremer5@llnl.gov

Dr. Harshitha Menon
Research Scientist
Lawrence Livermore National Laboratory
Center for Applied Scientific Computing
✉ harshitha@llnl.gov