MEGHANTO MAJUMDER

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Computer scientist driven by curiosity and continuous improvement, with experience optimizing algorithms and solving complex technical challenges.

TECHNICAL SKILLS

Programming Languages: Python, C++, C, SQL (basic), R
Data Processing: NumPy, SciPy, Pandas, Matplotlib, PyTorch
High-Performance Computing: OpenMP, MPI, Numba
Specialized Libraries: VTK-m, VTK, Conduit
Visualization Software: VisIt, ParaView

EXPERIENCE

Graduate Student Intern **Jun 2024 – Sep 2024**
Los Alamos National Laboratory
Worked with Dr. Roxana Bujack and Dr. Ayan Biswas to:

- Developed clustering algorithms for processing large-scale datasets (10M+ data points), achieving 200x performance improvements through optimization techniques
- Optimized neural network-based field reconstruction, implementing CPU-based solutions with significant performance gains
- Implemented parallel reconstruction algorithms including CGAL-based interpolator, achieving 300x speedup over baseline methods

Graduate Student Intern **Jun 2023 – Sep 2023**
Los Alamos National Laboratory
Worked with Dr. Ayan Biswas and Li-Ta Lo to:

- Implemented and optimized data sampling algorithms, improving processing efficiency for large vector field datasets
- Evaluated and benchmarked existing sampling techniques on vector field datasets to establish performance baselines
- Contributed efficient data-driven sampling implementations to VTK-m open-source library used by research community
- Accelerated Python code performance using numba and pymp optimization techniques
- Contributed key functionality to VTK-m and VTK-h libraries during ANL hackathon 2023

Graduate Research Assistant **Mar 2022 – Jun 2023**
University of Oregon

- Worked on the ECP ALPINE project, contributing new functionalities to the Ascent and VTK-h open-source libraries
- Collaborated with AMR-Wind application team on Crusher supercomputer, implementing visualization workflows using Ascent
- Created data pipeline to convert Conduit blueprint files into GLTF files in Ascent for web-based visualization
- Utilized VTK-m, VTK, Conduit and other libraries for high-performance data processing and analysis

Graduate Teaching Assistant **Sep 2021 – Jun 2025**
University of Oregon
Courses taught:

- Introduction to Computer Science #1 (F'21), #2 (W'22, S'25), #3 (F'23, S'24, F'24)

- Introduction to Web Programming (W'24)
- Fluency in Information Technology (W'25)

Responsibilities:

- Led discussion sections and held office hours
- Prepared course materials, graded assignments, led coding boot camps and conducted code demos across multiple programming courses

System Engineer Specialist **Sep 2020 – Aug 2021**

Infosys

Worked on data migration and database optimization projects for healthcare clients including AmeriHealth Caritas and Health Care Service Corporation.

- Migrated legacy SAS codebase to SQL and Spark dataframe implementations
- Performed database refactoring and query optimization for large healthcare datasets
- Collaborated on data pipeline modernization using distributed computing frameworks

RELEVANT COURSEWORK

- Data Science, Distributed Systems, Parallel Processing, Algorithms & Complexity

RESEARCH PROJECTS

- Neural network-based compression algorithm using SZ residual prediction for improved accuracy at fixed compression ratios (Winter 2025)
- Timestep selection algorithm analysis: data synthesis and visualization for scientific simulation research in collaboration with Y. Kawakami (2022-2023)
- Voxel-based renderer development for data compression applications (2023)

PUBLICATIONS

- M. Majumder, A. Biswas, and H. Childs, "A Multi-Phase Framework for Vector Field Sampling Using FTLE, Context, and Gradient Features," Master's Thesis, University of Oregon, 2025.
- J. Ahrens, M. Arienti, U. Ayachit, et al. (including M. Majumder), "The ECP ALPINE project: In situ and post hoc visualization infrastructure and analysis capabilities for exascale," The International Journal of High Performance Computing Applications, vol. 39, no. 1, pp. 32–51, 2025.
- A. Biswas, A. Mishra, M. Majumder, S. Hazarika, A. Most, J. Castorena, C. Bryan, et al. "Filling the Void: Data-Driven Machine Learning-Based Reconstruction of Sampled Spatiotemporal Scientific Simulation Data," 2024, pp. 290–99.
- M. Majumder, N. Marsaglia and H. Childs, "New Triggers for Automatic Camera Placement Over Time," 2022 IEEE 12th Symposium on Large Data Analysis and Visualization (LDAV), Oklahoma City, OK, USA, 2022, pp. 1-2
- N. Marsaglia, M. Majumder and H. Childs, "A Trigger-Based Approach for Optimizing Camera Placement Over Time," in 2022 IEEE/ACM International Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization (ISAV), Dallas, TX, USA, 2022 pp. 14-19.

EDUCATION

Master of Science, Computer Science **June 2025**

University of Oregon · GPA: 3.46/4.0

Bachelor of Technology, Computer Science & Engineering **2016 – 2020**

Maulana Abul Kalam Azad University of Technology, West Bengal, India · GPA: 9.03/10.0