AASHISH PANDEY

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BACKGROUND

My research focuses on the analysis of dynamic networks through the design of benchmarks, applications, and scalable algorithms. I am interested in studying evolving interaction patterns in high-performance computing environments, specifically in patterns related to I/O access and interprocess communications.

TECHNICAL STRENGTHS

Programming Languages	C, C++, Cuda, Python, Java, Matlab
Skills	Data Structure and Algorithms, ML, Parallel Programming, Dynamic Networks
Technologies	OpenMP, MPI, TensorFlow, Keras, Scikit-Learn, Pandas, Dask, Tableau

EDUCATIONAL QUALIFICATION

Ph.D. in Computer Science *Expected Graduation: 2026*
UNIVERSITY OF NORTH TEXAS GPA: 4.0
Thesis Title: Scalable Graph Algorithms in High Performance Computing.
Supervisor: *Dr. Sanjukta Bhowmick*

M.S in Computer Science *2023*
UNIVERSITY OF NORTH TEXAS GPA: 4.0

B.S in Computer Science, Minor in Mathematics *2019*
UNIVERSITY OF NORTH TEXAS GPA: 3.7

WORK EXPERIENCE

- **Computing Graduate Student Intern** *May 2024 - Aug 2024*
  Lawrence Livermore National Laboratory
  Livermore, California
  - ➢ Run and collect I/O traces for AI-driven workflows and their components on LC machines.
  - ➢ Analyze and visualize dependency graph for these workflows and identify bottleneck.
  - ➢ Use mitigation strategies to reduce the bottleneck and improve workflow performance.
- **Research Associate Intern** *Summer 2023 - May 2024*
  Global Computing Laboratory
  University of Tennessee, Knoxville
  - ➢ Creating tutorial material for **ANACIN-X**, a software package developed by researchers at GC Lab to identify the source and degree of non-determinism in MPI applications.
  - ➢ Collaborating with other scientists to develop a jupyter-notebook implementation of the software, also improve usability and readability of software.
- **Graduate Research Assistant** *Fall 2020 - Present*
  Department of Computer Science & Engineering
  University of North Texas
  - ➢ Designing and implementing parallel algorithms for dynamic network analysis.
  - ➢ Presenting research works in conferences and workshops.

- **Teaching Assistant** Software Development Capstone *Spring 2020, Summer 2025*
  Department of Computer Science & Engineering
  University of North Texas
  - ➢ Mentoring undergraduate students on various stages of software development, programming tools and languages.
  - ➢ Assisting instructor during lectures, designing assignments, and grading.

PUBLICATIONS

- **Pandey, A**., Prasadan, A., Field, R. V., Wendt, J. D., Phillips, C. A., Soundarajan, S., & Bhowmick, S. *Dynamics of Triadic Closure in Complex Networks.* The 14^{th} International Conference on Complex Networks and Their Applications (Complex Networks 2025), Binghamton, NY, USA.
- J. Marquez, B. Bogale, **A. Pandey**, N. Tan, L. Whitnah, S. Bhowmick, M. Taufer, *Teaching Nondeterminism in High Performance Applications* EduHPC Lightning Talk Summary. In Proceedings of the SC '23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W '23). Association for Computing Machinery, New York, NY, USA, 374–378. https://doi.org/10.1145/3624062.3625542
- S. Srinivasan, A. Khanda, S. Srinivasan, **A. Pandey**, S. K. Das, S. Bhowmick, and B. Norris, *"A Distributed Algorithm for Identifying Strongly Connected Components on Incremental Graphs,"* 2023 IEEE 35th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), Porto Alegre, Brazil, 2023, pp. 109-118, doi: 10.1109/SBAC-PAD59825.2023.00020.

PEER-REVIEWED POSTERS

- **A. Pandey**, A. Khanda, S. M. Shovan, A. Y. Khan, B. Norris, S. K. Das, and S. Bhowmick, Algorithms and Applications of Dynamic Network Analysis using CANDY, *The International Conference for High Performance Computing, Networking, Storage and Analysis*, November 16-21, 2025, St. Louis, MO, USA. [**Best Poster Finalist**]
- Khanda. A, Shovan. SM, **Pandey. A** , Hosseini. F, Das. S K, Norris. B, and Bhowmick S, *Efficient Approaches to Analyzing Large Dynamic Networks* The International Confrence for High Performance Computing, Networking, Storage and Analysis, November 17-24, 2024, Atlanta, GA, USA. https://sc24.supercomputing.org/proceedings/poster/poster_pages/post217.html
- **Pandey. A**, Khanda. A, Srinivasan. S, Srinivasan. S, Shovan. S, Hosseini. F, S. K. Das, Norris. B, and Bhowmick S, *Scalable Algorithms for Analyzing Large Dynamic Networks using CANDY* The International Conference for High Performance Computing, Networking, Storage and Analysis, November 12-17, 2023, Denver, CO, USA.
  https://sc23.supercomputing.org/proceedings/tech_poster/poster_files/rpost210s3-file2.pdf
- **Pandey. A**, Hosseini. F, Khanda. A, Srinivasan. S, Srinivasan. S, S. K. Das, Norris. B, and Bhowmick S, *Improving Graph Property Computation in Large Dynamic Networks with CANDY*, CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference, 2023
- **Pandey, A**., Khanda, A., Srinivasan, S., Bhowmick, S., Das, S. K., & Norris, B. (n.d.). *CANDY: An efficient framework for updating properties on large dynamic networks.* The International Conference for High Performance Computing, Networking, Storage and Analysis, November 13-18, 2022, Dallas, Tx, USA.
  https://sc22.supercomputing.org/proceedings/tech_poster/poster_files/rpost153s3-file3.pdf
- Srinivasan, S., **Pandey, A**., Khanda, A., Srinivasan, S., & Das, S. K. (n.d.). *Parallel framework for updating large scale dynamic networks.* The International Conference for High Performance Computing, Networking, Storage and Analysis, November 13-18, 2021, St. Louis, MO, USA.
  https://sc21.supercomputing.org/proceedings/tech_poster/poster_files/rpost162s2-file2.pdf

CONTRIBUTED LECTURE / LIGHTENING TALK

- **Pandey, A**., Streaming Network Generation Using Graph Based Time Series Model. *Workshop on Network Algorithms, Analysis, and Learning For Science*, November 5-6, 2025, Berkely, CA
- **Pandey, A**., Scalable Algorithm for Strongly Connected Component Updates in Large Dynamic Graphs. *SIAM Conference on Computational Science and Engineering (CSE2025)*, March 3-7, 2025. Fort Worth, TX

CURRENT RESEARCH WORKS

- **Parallel Identification of Strongly Connected Components in Large Scale Dynamic Graphs**
  - ➢ Developing a **shared-memory** and **GPU** implementation of an algorithm to identify Strongly Connected Components in dynamic graphs.
  - ➢ Collaboration: University of Oregon, Missouri Institute of Science and Technology
- **Streaming Network Generation using Graph-Based Time Series Model**
  - ➢ Creating a time series model to learn the temporal and structural properties of streaming network data.
  - ➢ Developing a tool for generating synthetic dynamic networks.
  - ➢ Collaboration: Sandia National Laboratory
- **Characterizing I/O in Scientific Workflows using Graph Techniques**
  - ➢ Representing I/O in scientific workflows as graph
  - ➢ Applying graph metrics to identify the I/O bottlenecks in hpc workflows .
  - ➢ Collaboration: Lawrence Livermore National Laboratory

PARTICIPATION

- **Lead Student Volunteer** *2025*
  - The International Conference for High Performance Computing, Networking, Storage and Analysis
- **Student Volunteer** *2021, 2022, 2023, 2024*
  - The International Conference for High Performance Computing, Networking, Storage and Analysis
- **Teaching Assistant** *Feb 19 - Feb 21, 2021*
  OurCS@DFW Workshop, Dallas, Texas.

COURSE WORKS

- **Graduate**
  Big Data and Data Science, Methods of Numerical Computations, Graph Theory, Computer Architecture, Distributed and Parallel Database, Machine Learning, Deep Learning, Artificial Intelligence, Bio-computing, Natural Language Processing, Feature Engineering, Scientific Data Visualization, Deep Learning in Biology
- **Undergraduate**
  Digital Image Processing, Algorithms, Programming Languages, Data Structures, Differential Equations, Real Analysis, Automata Theory, Secure e-commerce, Cryptography

ORGANIZATIONS

- Youth and Sports Coordinator, Lumbini Service Society *2021 - 2023*
- Charter Member, Dallas Lumbini Lions Club *2022 - 2024*
- Member, Phi Theta Kappa Honor Society *Jan 2016 - Present*

- Member, Nepalese Student Association, University of North Texas *Sep 2017 - Present*
- Member, Association of Computing Machinery(ACM) *2021 - Present*
- Member, Society of Industrial and Applied Mathematics(SIAM) *January 2025 - Present*