AASHISH PANDEY

1404 Shannon Pl, Carrollton, Texas, 75006
Phone:+1 580-695-6920 ||*Website* :*helloaashish.github.io*
E-mail: aashishpandey@my.unt.edu

BACKGROUND

I am currently a third-year Ph.D. student. My research is focused on developing parallel and scalable algorithms for analyzing large-scale dynamic networks. I am interested in generating realistic network benchmarks and performing comprehensive analyses of dynamic networks using various machine-learning techniques and high-performance computing tools.

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, Tableau

EDUCATIONAL QUALIFICATION

Ph.D. in Computer Science *Expected Graduation: 2025*
Department of Computer Science and Engineering GPA: 4.0
UNIVERSITY OF NORTH TEXAS
Thesis Title: Towards Dynamic Network Analysis: Scalable Algorithms and Realistic Benchmarks.
Supervisor: *Dr. Sanjukta Bhowmick*

M.S in Computer Science *2023*
Department of Computer Science and Engineering GPA: 4.0
UNIVERSITY OF NORTH TEXAS

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

WORK EXPERIENCE

- **Research Associate Intern** *Summer 2023 - Present*
  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.
  - ➢ Conducting literature reviews to understand the steps and current state of ANACIN-X.
  - ➢ Collaborate with other scientists to develop a jupyter-notebook implementation of the software, also improve usability and readability of software.

- **Research Assistant** *Fall 2020 - Present*
  Department of Computer Science & Engineering
  University of North Texas
  - ➢ Design and implement parallel algorithms for dynamic network analysis.
  - ➢ Experimentation and documentation of research procedures.
  - ➢ Participation in conferences and workshops to present research works.

- **Teaching Assistant** Software Development Capstone *Spring 2020*
  Department of Computer Science & Engineering
  University of North Texas

- ➢ Mentoring undergraduate students on various stages of software development.
- ➢ Assisting instructor during lectures, designing assignments, and grading.
- ➢ Assisting students using software tools and programming languages.

PUBLICATIONS

- J. Marquez, B. Bogale, A. Pandey, N. Tan, L. Whitnah, S. Bhowmick, M. Taufer, *Teaching Non-determinism in High Performance Applications* SC23 Workshop: EduHPC Lightning Talk Presentation, 2023
- 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* IEEE 35th Int'l Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), 2023
- S. Srinivasan, A. Khanda, A. Pandey, F. Hosseini, S. Srinivasan, B. Norris, S. K. Das, and S. Bhowmick, *A Parallel Algorithm for Updating Page Rank in Large Scale Dynamic Networks* IEEE Int'l Conference on High Performance Computing, Data, Analytics, and Data Science (HiPC) 2023, (under review)

POSTERS

- 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, Texas, 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`

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

ACADEMIC PROJECTS

- **Network analysis and Machine learning for Bio-informatics**
  - ➢ Used **protein-protein interaction** dataset to create PPI network, performed an analysis of PPI network using Louvain Community Detection, **functional analysis** of detected communities were performed using WebGestalt (WEB-based Gene SeT Analysis Toolkit) .

➢ Developed **ConvARG**: a convolutional neural network **CNN** based model for identifying antimicrobial resistant genes.

- **Deep Learning for Image Recognition and Downstream Applications**
  ➢ Developed a classification model for **Hand Gesture Recognization**, used image-processing and **feature engineering** techniques to train **Naive Bayes Classifier** and **Logistic Regression** to generate an accuracy of .95.
  ➢ Developed **CNN** model for identifying handwritten sudoku puzzle. By converting the digits and vacant spaces into a graph representation, a **graph-coloring** algorithm was used to solve the puzzles.

- **Natural Language Processing for Stock Prediction**
  ➢ Employed **NLP** techniques to extract and analyze sentiment data, utilizing the Flair sentiment analysis tool for sentiment quantification. Additionally, applied Linear Regression to forecast stock values, contributing to enhanced predictive modeling.

PARTICIPATION

- **The International Conference for High Performance Computing, Networking, Storage and Analysis, 2022, Dallas, TX** *Nov 13 - Nov 18, 2022*
- **The International Conference for High Performance Computing, Networking, Storage and Analysis, 2021, St. Louis, MO** *Nov 13 - Nov 18, 2021*
  Student Volunteer
- **OurCS@DFW Workshop** *Feb 19 - Feb 21, 2021*
  Teaching Assistant at Graph Fun workshop.

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 - Present*
- Member, Phi Theta Kappa Honor Society *Jan 2016 - Present*
- Member, Nepalese Student Association, University of North Texas *Sep 2017 - Present*