

AASHISH PANDEY

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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

Global Computing Laboratory

University 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.

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 Recognition**, 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.

POSTERS

- 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

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

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|---|---------------------------|
| • Youth and Sports Coordinator, Lumbini Service Society | <i>2022 - Present</i> |
| • Charter Member, Dallas Lumbini Lions Club | <i>2022 - Present</i> |
| • Member, Phi Theta Kappa Honor Society | <i>Jan 2016 - Present</i> |
| • Member, Nepalese Student Association, University of North Texas | <i>Sep 2017 - Present</i> |