Shrabani Ghosh

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Research Interest

Data Science, Graph Theory, Machine Learning, Social Media Mining, Natural Language Processing (NLP), Large Language Models (LLMs)

Education

University of North Carolina Charlotte, PhD in Computer Science — Sept 2020 – Present

- GPA: 3.66/4.0

Old Dominion University , Masters in Computational Modeling & Simulation Engg — Aug 2016 – Dec 2019

- GPA: 3.62/4.0

Selected Research Projects

Community Detection Framework for Different Downstream Tasks (Advised by Dr. Erik Saule) — June 2023 – Present

- Collected extensive graph data for various applications (e.g., anomaly detection, trust prediction).
- Applied community detection algorithms from statistical to Graph Neural Network (GNN) to large graphs for task-based analysis.
- Compared performance accuracy of Anomaly detection using XGBoost classification model, Trust prediction using TrustSVD, Recommendations system using collaborative filtering.
- Developing a framework to assist data scientists in community detection.

Railroad Trespassing & Safety Analysis on Twitter (Advised by Dr. Yuting Chen) — May 2022 – August 2023

- Scraped and preprocessed Twitter data on railroad safety.
- Conducted topic modeling, sentiment analysis, emotion analysis, and hashtag analysis using LLM.
- Investigated FRA data for railroad companies' social media activity

Scholarly Network Analysis (Advised by Dr. Bojan Cukic & Dr. Erik Saule) — Jan 2022 – Mar 2025

- Collected and processed large-scale scholarly data from Google Scholar, ORCID, and DBLP and constructed collaboration network.
- Investigated publication patterns, influential authors and frequently affiliated organizations
- Applied BERTopic to extract top research themes and trends over time and GPT-4 Turbo to classify institutional collaboration categories and analyze their research involvement.
- Investigated and compared network structures and collaboration dynamics across distinct research fields.
- Identified bias & disparities based on gender and race in research communities.

Selected Publications

The Role of Community Detection Methods in Performance Variations of Graph Mining Tasks (under review) — Gitrepo

Shrabani Ghosh, Erik Saule

Railroad Trespassing and Safety: A Systematic Analysis of Twitter Data — Gitrepo

Shrabani Ghosh, Yuting Chen,Wenwen Dou

10.1016/j.cstp.2024.101154

Examining Different Research Communities: Authorship Network — Gitrepo

Shrabani Ghosh

10.1007/978-3-031-82435-76

Experience

Research Assistant

- Over 5 years of research experience in contributing to projects in machine learning, graph mining, scientometrics, and scholarly network analysis through survey, data collection, algorithm development, and publication of results.

Instructor & Teaching Assistant

- Lectured on Logic, Data Structure and Algorithm course
- Designed course projects, assignments, and exams.
- Supervised undergraduate students for projects design and implementations
- Graded assignments and conducted office hours.

Awards

- Future Faculty Teaching Fellowship Award UNC Charlotte (FFTF) 2025
- Graduate School Summer Fellowship Award UNC Charlotte (GSSF) 2025
- Summer Institute in Computational Social Science (SICSS-Atlanta) 2023
- Grace Hopper Celebration Scholarship (GHC) 2022
- Grad-Cohort Conference Scholarship (CRA-WP) 2022

Technologies

Languages: Python, C++, MATLAB, HTML/CSS, Slurm

Machine Learning Libraries: PyTorch, TensorFlow

GPU Computing Parallelization: CUDA, PyTorch with GPU, TensorFlow-GPU, SLURM, MPI

High-Performance Computing (HPC): GPU clusters (e.g., ORION, Nebula), SLURM job scheduling, parallel processing on multi-node systems

Large-Scale Graph Processing: NetworkX, iGraph

Visualization Toolkit ITK, VTK, Matplotlib