

# Shubhangi Agarwal

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## SUMMARY

I am a researcher with an interest in Graphs and Graph databases. I have developed various algorithms based on statistical analysis for **Subgraph Querying** in large complex graphs. Some of the many areas that can benefit from the querying of subgraph structures are **information extraction, recommendation systems, disease diagnostics, fraud detection**.

Currently, I am working on **HyGraphs**, where as a team we are exploring, with a goal to develop a novel data model combining property graphs and time series data models.

## EDUCATION

### Ph.D. in Computer Science and Engineering

Indian Institute of Technology Kanpur, Uttar Pradesh, India

CGPA: 8.25

2014 - 2023

### Bachelor of Technology Computer Engineering

Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat, India

CGPA: 8.71

2010 - 2014

## PHD THESIS

### Subgraph Matching and Mining in Large Graphs

Supervisor: Arnab Bhattacharya

- Developed algorithms for Approximate Subgraph Matching in both deterministic and probabilistic graphs.
- Proposed a Graph Neural Network model for robust node embeddings with positional information.

## PUBLICATIONS

- “Towards hybrid graphs: Unifying property graphs and time series”, Mouna Ammar, Christopher Rost, Riccardo Tommasini, **Shubhangi Agarwal**, Angela Bonifati, Petra Selmer, Evgeny Kharlamov and Erhard Rahm, 28th International Conference on Extending Database Technology (EDBT), 2025, Spain.
- “Transforming Time Series into Graphs and Back with HyGraph”, Mouna Ammar, **Shubhangi Agarwal**, Angela Bonifati and Erhard Rahm, Proceedings of the Workshops of the EDBT/ICDT Joint Conference, 2025, Spain.
- “VeNoM: Approximate Subgraph Matching with Enhanced Neighbourhood Structural Information”, **Shubhangi Agarwal**, Sourav Dutta and Arnab Bhattacharya, 7th Joint International Conference on Data Science and Management of Data (CODS-COMAD), 2024, India.
- “VerSaChI: Finding Statistically Significant Subgraph Matches using Chebyshev’s Inequality”, **Shubhangi Agarwal**, Sourav Dutta and Arnab Bhattacharya, Proceedings of the International Conference on Information and Knowledge Management (CIKM), 2021, pages 2812-2816, Australia.
- “GraphReach: Position-Aware Graph Neural Network using Reachability Estimations”, Sunil Nishad, **Shubhangi Agarwal**, Arnab Bhattacharya and Sayan Ranu, Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI), 2021, pages 1527-1533, Canada.
- “ChiSeL: Graph Similarity Search using Chi-Squared Statistics in Large Probabilistic Graphs”, **Shubhangi Agarwal**, Sourav Dutta and Arnab Bhattacharya, Proceedings of the International Conference on Very Large Data Bases (VLDB), 2020, pages 1654-1668, Japan.

## EXPERIENCES

### Post-doctoral Researcher

May 2024 - Apr 2025

- Worked on the ANR-DFG project ‘HyGraph: Querying and Analytics on Hybrid Graphs’ with a mid-sized team.

### Senior Student Research Associate

Aug 2022 - Dec 2023

- Worked on the project ‘Short and Long-term Fog Prediction for North Indian Cities’.

### Program Committee Member

2025 - current

- GRADES-NDA Workshop - SIGMOD/ PODS (2025), ICWE (2025), TGD Workshop - EDBT/ ICDT (2025).

### External Reviewer

2020 - current

- WSDM (2024), CIKM (2021, 2022), DASFAA (2022), CoDS-COMAD (2020, 2021), KDD (2021).

#### Intern with Flipkart Internet Private Limited

Jun 2015 - Jul 2015

- Worked in a project to prepare a model for identification of 'fake' listings.

#### Summer Research Internship at IIT Gandhinagar

May 2012 - July 2012

- Worked under Prof. Pawan Lingras on Time Series Analysis

## TEACHING

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#### Instructor

Jan 2025 – Mar 2025

Claude Bernard University Lyon 1

- Program: M2 - Data and Intelligence for Smart Systems (DISS)
- Course: Data Processing and Analytics (Jointly with others)

#### Teaching Assistant (IIT Kanpur)

Aug 2014 - Apr 2021

- Graded and evaluated projects for various courses of Computer Science.

#### Senior Tutor (IIT Kanpur)

Aug 2017 - Apr 2018, Aug 2019 - Apr 2020

- Led teams of strength ~60; Assisted in backend management, paper-setting and grading.

#### Teaching Assistant for MOOC (NPTEL - Remote)

July 2017 - Sep 2017

- Crafted objective questions and resolved student queries on Fundamentals of Database Systems.

## TECHNICAL SKILLS

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**Languages** : C, C++, Python, Java, R, JavaScript, PHP, Shell scripting

**Databases** : MySQL, Neo4j

**Libraries** : PyTorch, Tensorflow, Scikit-learn, Numpy, Pandas

**Tools** : git, LaTeX, Docker, Weka

## REFERENCES

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#### Arnab Bhattacharya

Professor, Indian Institute of Technology Kanpur, India

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#### Sourav Dutta

Chief NLP Research Scientist, Huawei Research Centre, Dublin, Ireland

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