# Sumit Kumar

PhD Scholar,
Computer Science & Engg,
Indraprastha Institute of Information Technology Delhi

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## Summary

My research primarily focuses on the challenges and opportunities in networking for AI/ML systems. More specifically, my future work aims to design scalable, low-latency, multi-tenant network and system architectures for AI training and inference workloads.

## Education

- **Indraprastha Institute of Information Technology, Delhi** — Delhi, India
  *Ph.D. Computer Science and Engineering (CSE)* — Since Oct 2023
    - Advisor: Dr. Rinku Shah
    - Course work: Programmable Networks, Distributed Systems, Object Oriented Programming: and Design, Graduate Systems and Research Methods.
    - GPA: 8.33 / 10

- **Jawaharlal Nehru University, New Delhi** — Delhi, India
  *M.Tech Statistical Computing (Data Communication)* — 2020 - 2022
    - Thesis Title: Minimizing Energy Of Multi-Hop Routing Protocol In Wireless Sensor Network
    - Advisor: Dr. Karan Singh
    - GPA: 8.0 / 9

- **Central University of South Bihar, Gaya** — Bihar, India
  *M.Sc. in Computer Science* — 2018 - 2020
    - Thesis Title: IPSec VPN (Implementation of IPSec Tunnel Between Two Sites)
    - GPA: 8.54 / 10

- **Magadh University (Gaya College), Gaya** — Chattishgarh, India
  *Bachelor in Computer Application* — 2014 - 2017
    - Score: 65 / 100

## Professional Experience

- **Teaching Assistant** — New Delhi, India
  **Indraprastha Institute of Information Technology Delhi** — 2023 - 2024
    - Conducted tutorials, assignment demos, quiz preparation, paper checking, and grading:
        * Computer Networks (Monsoon 2024)

- **Machine Learning Intern** — Gurugram, India
  **CNH Industrial** — Mar 2023 - Dec 2022
    - Solve customer-centric problems in the agricultural machinery industry through NLP/generative AI.

## Skills

- **Programming Languages:** C, C++, Python, Bash shell

- **Libraries/Software Packages**: torch, numpy, pandas, sklearn, matplotlib, PyTorch, scrcpy

- **Software Tools**: Git, Docker, Visual Studio Code, Eclipse, Kubernetes

- **Miscellaneous**: Algorithms, Network, Data Structures, Problem Solving

## Current Projects

- **Simulating LLM training workloads for heterogeneous compute and network infrastructure:** Developing a simulation framework for large-scale distributed LLM training that accounts for realistic hardware heterogeneity across GPU clusters. The simulator enables predictive modeling of training time by incorporating non-uniform workload partitioning, custom device group configurations, and flexible device-to-parallelism mappings. Designed to bridge the gap between idealized homogeneous setups in existing simulators and practical, heterogeneous cloud environments.

## Awards and Fellowship

- **Letter of Appreciation:** Volunteered and conducted a hands-on session on Linux networking at the ACM Winter School 2023.

- **Master of Technology Fellowship:** Awarded Non-NET Postgraduate Scholarship for a 2-year master's program.

- **NET:** Qualified the National Eligibility Test in Computer Science in 2023.

## Academic Service

- Presented a poster at CSE Day 2025 IIITD.

- Volunteered and conducted a hands-on session on Linux networking at the ACM Winter School 2023.

## References

- **Rinku Shah**
  Assistant Professor
  Department of Computer Science
  Indraprastha Institute of Information Technology Delhi (IIIT-Delhi)
  Email: rinku@iiitd.ac.in
  Website: `https://faculty.iiitd.ac.in/~rinku/`
  Google Scholar: `https://scholar.google.co.in/citations?user=jNhSvOEAAAAJ`