Rupam Roy

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Professional Summary

Motivated M.Tech CSE student at IIT Bhilai, specializing in Software Engineering, Machine Learning (ML), and *Graph Neural Networks (GNN)*. Known for strong communication skills and the ability to explain complex concepts. Highly curious and skilled in developing scalable solutions and optimizing performance using Python and CUDA. Proven ability to implement data-driven solutions with GPU acceleration and develop reproducible machine-learning models for real-world applications.

Education

Indian Institute of Technology – Bhilai — **Chhattisgarh, India**
M.Tech, Computer Science & Engineering — **CGPA: 7.62** — July 2024 – Present

Maulana Abul Kalam Azad University of Technology (MAKAUT) — **West Bengal, India**
B.Tech, Computer Science & Engineering — **CGPA: 9.18** — July 2018 – June 2022

Experience

Teaching Assistant, Department of Computer Science, **IIT Bhilai** — 2024 – Present
- Conduct tutorials and labs in Programming with C, *Data Structures & Algorithms (DSA)*, and *Computer Organization & Architecture (COA)*, improving student comprehension of complex concepts.

Academic Projects

Efficient Graph Coarsening Techniques for Scalable Graph Neural Networks — *Ongoing Thesis*
Supervisor: Dr. Vishwesh Jatala, IIT Bhilai
- Developed *CUDA-accelerated spectral graph coarsening* for high-performance GNN training, achieving up to **3× speedup**.
- Validated on large-scale datasets (*Reddit*, *ogbn-products*) while preserving downstream model accuracy.

OpenWindow — Lightweight Social Media Platform — Live
- Designed and engineered a lightweight social-media-style web application with user interaction features.
- Deployed the full-stack application on Render, handling backend APIs and frontend integration.
- Focused on simplicity, performance, and clean system architecture

Watch2Gether — Synchronized Video Watching Platform — Live
- Implemented a full-stack web platform enabling users to watch videos together in a synchronized environment.
- Formulated a room-based architecture with real-time playback synchronization and user coordination.
- Launched the frontend on Vercel and the backend on Render, focusing on low-latency synchronization and scalable system design.

Music-Artist Collaboration Network Analysis — *April 2025*
Dr. Rishi Ranjan Singh, Associate Professor
- Conducted a graph-based analysis of artist collaboration networks to study structural patterns and connectivity.
- Analyzed multiple forms of artist relationships, revealing how collaborations emerge across genres and communities.
- Explored network properties including connectivity, clustering, and centrality to understand collaboration dynamics.

Voice-Activated Personal Assistant — *July 2022*
Dr. Krishna Kumar Jha, Associate Professor
- Built a real-time desktop voice assistant using Python with speech recognition and NLP for command processing.
- Achieved **92.5% command recognition accuracy**, validated on **500+ user inputs**.

Certifications

- **GATE (Computer Science and Engineering)**, 2024 — 98.8658 Percentile
- **GATE (Computer Science and Engineering)**, 2023 — 97.3930 Percentile

Technical Skills

Programming Languages: Python, C, C++, Java, JavaScript, PHP, CUDA (*GPU Parallel Programming*)
Frontend Technologies: HTML, CSS, JavaScript, React.js
Backend Technologies: Node.js, Express.js, RESTful API Design
Databases & Cloud: MySQL, SQL, Google Cloud Platform (GCP), Amazon Web Services (AWS)
Core CS & Systems: Data Structures & Algorithms (DSA), Database Management Systems (DBMS), Operating Systems, Computer Networking, **System Design**
Machine Learning & AI: Machine Learning, Deep Learning, Graph Neural Networks (GNN)
Tools: Git, Docker, Linux, Windows, Visual Studio Code, Jupyter Notebook, Command-line tools

Leadership Activities

- **Google Developer Groups (GDG)** — Mentor
- **Placement Coordinator** — CSE, **IIT Bhilai**
- **Department Postgraduate Committee (DPGC) Member** — CSE, **IIT Bhilai**