






# Prateek Jain

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## EDUCATION

### PhD in Computer Science, CGPA: 4.0

Specializing in transport layer protocols and network performance optimization.

Boston University, MA

Jan 2024 – present

### MS in Computer Science, CGPA: 3.96

Specialization in Cyber Security

Boston University, MA

Sept 2022 – Dec 2024

### Bachelor of Engineering, 73.45%

Information Technology

Delhi College of Engineering (DTU), India

Aug 2006 – July 2010

## SKILLS

C/C++, Java, Python, JavaScript, SQL, MongoDB, ELK Stack, MEAN Stack, Nessus, Wireshark, iperf3, Burp Suite, Flink

## EXPERIENCE

### Doctoral Student

Boston University, Jan 2024 – present

- Analyzing the **UDP-based QUIC protocol**, with a focus on **connection migration** to enhance data communication reliability in poor connectivity environment using quic-go and ns-3 emulation.
- Conducted advanced research to optimize the Recursive Inter Network Architecture (RINA)-based **Multi-Layer Error Detection (MLED)** model, reducing the **probability of undetected errors in large-scale file transfers**.
- Designed and implemented a **C++ application** to run **MLED** on the **FABRIC** and **Chameleon testbed**, demonstrating its potential in ensuring **data integrity across large-scale data transfers**.
- Mentored a senior undergraduate student** to develop a **React-based GUI** webpage to simplify the creation of configuration files for running the MLED model, enhancing user experience and accessibility. [Link](#)

### Research Intern

Google, May 2025 – Present

- Collaborating with the networking team at Google to evaluate the impact of **connection and port migration** on QUIC protocol performance under varying network conditions.
- Analyzing latency, throughput, and connection stability using Google's **QUICHE (Chromium's QUIC library)** and simulating scenarios with **quic-go** and **ns-3**.
- Contributing to experimental evaluations on the **FABRIC testbed** to help inform and improve real-world QUIC deployments.

### Assistant Commandant (Technical)

Central Reserve Police Force, Feb 2014 – Mar 2022

- Led the development of **Android and web applications**, streamlining data collection, management, integration, and analysis processes, which **reduced operational time from several days to a few hours**, improving efficiency and productivity.

## PROJECTS

### Connection Migration in QUIC – Google Research Internship

May 2025 – Present

Google

- Collaborating with **Google** to analyse the **QUIC protocol** to evaluate the impact of its features such as **connection migration** and **port migration** on **latency** and **network performance** in **varied connectivity conditions**.
- Understanding Google's open-source **chromium implementation using QUICHE** to analyze QUIC's advanced features, including connection migration.
- Conducting real-world performance evaluations using the **ns-3 simulator** and **quic-go** on the **FABRIC testbed**, focusing on latency, stability, and efficiency across varying network conditions.

### Heterogeneity-Aware Dynamic Operator Placement at Edge Devices

Jan 2025 – Present

Research Project

- Developed a heterogeneity-aware operator placement algorithm for **stream processing**, dynamically **offloading tasks** between servers and edge devices to optimize **real-time data processing**.
- Improved **query performance** under **varying network conditions** such as **latency** and **bandwidth constraints**, achieving enhanced throughput with virtually **zero downtime**.

### Multi-Layer Error Detection Model

May 2023 – April 2025

NSF-Funded Project

- Contributed to the **NSF-funded project** "A New Architecture for Petabyte-Scale File Transfer" by developing a **high-performance C/C++ application** that implements a configurable MLED architecture using coroutines and multi-threading.
- Evaluated the performance of the **MLED architecture** under **varying network conditions** simulated using **iperf3**.
- Enhanced **reliability** by reducing the **probability of undetected errors** to the order of  $10^{-100}$ , significantly **improving data integrity** in **large-scale file transfers**.

## ACHIEVEMENTS

- Received the **best poster presentation award** at **KNIT7 (2023)**, Ohio for presenting the work on the **MLED**.
- Recognized as the **runner-up** in **poster presentation** at **MERIF (2024)**, Kansas City.