

# ROHAN CHHABRA

Stony Brook, NY | +1 (631) 609-5522 | rochhabra@cs.stonybrook.edu | [linkedin.com/in/rohan23chhabra/](https://www.linkedin.com/in/rohan23chhabra/) | [github.com/rohan23chhabra](https://github.com/rohan23chhabra)

## WORK EXPERIENCE

### File Systems/Storage Intern – HPE Nimble Storage

San Jose, CA May 2022 - Aug 2022

- Designed a memory efficient Trie Index in C++ for S3 object keys which have variable length and common prefixes.
- Evaluated existing research on 3 papers - [Prefix B+ trees](#), [Adaptive Radix Trees](#) and [Generalised Prefix Trees](#).
- Reduced memory allocation by around 33% for 1K sized keys as compared to B+ trees.
- Reduced lookup time by around 20% as compared to B+ trees for around 350K keys.

### Software Engineer – Visa Inc

Bangalore, KA, India July 2019 - July 2021

- Improved the performance of [ISO8583](#) Parser by reducing heap allocations by 81% and CPU time by 65%. Used knowledge of how Golang garbage collects objects and lifecycle of objects in the heap including escape analysis.
- Decoupled a tight dependency between ISO8583 parser and its in memory representation using Domain Specific Languages which enabled the team to reduce production bugs by 90%.
- Optimised disk usage in BoltDB to tackle absent proto-buffer fields to just 6%. Used a bitmap driven approach to mask attributes as bits and stored the bitmap in BoltDB.
- Architected the low level design and development of a batching client for Cassandra, UMF Proprietary protocol and PII secure encryption for the Data Integration microservice. Worked on Kafka for event based communication between these microservices.
- Implemented a TCP Client Pool which reduced instantiation latency by 3500 ns for every client lookup. Incorporated Golang channels to write concurrency driven and timing sensitive code. These client pools led to efficient RESTful HTTP APIs.

### Software Engineer Intern – Visa Inc

Bangalore, KA, India May 2018 - July 2018

- Provisioned a real-time log forwarding pipeline using Fluentd and Docker to collect application logs in Splunk in active-active mode of servers which enabled the team to reduce manual log analysis time by 40%.

## EDUCATION

### MS, Computer Science – Stony Brook University, Stony Brook, NY

CGPA: 3.79

Aug 2021 - Dec 2022

- **Coursework:** Distributed Systems, Operating Systems, Networking, Analysis of Algorithms, Computer Vision
- **Grader Assistant:** Analysis of Algorithms | **Teaching Assistant:** Data Structures in Java.

### Bachelor of Technology, Computer Science – NIT Allahabad, India

CGPA: 9.0

July 2015 - May 2019

## PROJECTS AND RESEARCH WORK

- **File Systems Lab (Dr. Zadok) F3 Project:** Provisioned FUSE based volume mounts for serverless applications. Evaluated two kernel patches on FUSE which improved writeback cache performance. Worked on k8s, and FUSE linux patches.
- **WINGS Lab:** Led the development of a service that monitored network dataplane traffic using Openflow based switches and Linux Netfilter using IPTables over Mininet. Proposed a tree data structure to capture conflicts/redundancies in network policies.
- **Diem-BFT:** Implemented the Diem-BFT protocol for consensus on a Diem blockchain as specified in [this paper](#).
- **Trash Bin File System:** Implemented a file system to manage deleted resources that exposed APIs like temporal and permanent file deletion, access control, restoring files, user specific encryption keys, background cleaning etc.
- **Kernel queuing system:** Designed a kernel in-queuing system that processed userspace jobs asynchronously. Exposed APIs like GetStatus(), SubmitJob(), Poll() etc. Highly efficient system courtesy a smart Job id design and efficient locking primitives.
- **NetSys Lab IPFS Research:** Researching on file popularity within the [IPFS project](#) by measuring metrics like hop distance taken to retrieve the file from IPFS peers. Also, exploring a lot of P2P storage solutions similar to IPFS like Storj and Filecoin.
- **SysCryptocopy:** A simple system call implementation via a kernel module that encrypts input files and writes encrypted data to output files. Keys and cipher modes can be easily customised via the command line.

## TECHNICAL SKILLS

**Languages & DBs:** Java (2 years), Golang (2 years), C/C++ (1 year), Python, SQL, MySQL, BoltDB, Cassandra

**Tools, Frameworks and Paradigms:** Git, Mercurial, Kafka, Docker, Kubernetes, Kernel programming, Mininet, SDN, JavaFX, Android, XText, SpringBoot, GoogleTest, Scapy, Dpkt, FUSE, Splunk, Fluentd, POX, OpenFlow, Linux Netfilter

## EXTRA CURRICULAR ACTIVITIES

- **ACM ICPC:** [Represented Stony Brook University](#) & obtained [19th rank](#) in the prestigious ACM ICPC Greater NY regionals.
- **Public Speaking & Leadership:** Administered the annual hackathon Hack36, technical and cultural festivals “Avishkar” and “Culrav” & Computer Club during my final year at NIT Allahabad.
- **Blogging:** Published [22 articles on GeeksForGeeks](#) on number theory and Maths algorithms while maintaining [my own blog](#).
- **Pedagogy:** Taught Java, C++, Git & Competitive Programming to juniors while being a senior at NIT Allahabad.