Arnav Gupta

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Education

BITS Pilani, K.K. Birla Goa Campus Oct 2021 – Aug 2025 | India
B.E. (Hons.) Computer Science
Relevant coursework: Data Storage Technologies and Networks, Operating Systems, Data Structures and Algorithms, Computer Networks, Database Systems, Object Oriented Programming, Microprocessors and Interfacing

Narayana Co-Kaveri Bhavan 2019 – 2021 | India
High School | 95.6% in CBSE XII Boards

Professional Experience

Flamingoes Technologies Inc. May 2023 – Jul 2023 | Bangalore, India
Full-Stack Developer Internship | TypeScript, NestJS, MongoDB, React, React-Redux, SwaggerUI
- Developed an efficient admin **authentication & authorization API** using **JWT**, ensuring secure access to sensitive data and functionalities, and also created a **user-friendly UI** for the same
- Significantly enhanced **search functionality** by implementing **data structures**, leading to a remarkable **40%** boost in **search query performance**, which positively impacted **user experience**
- Implemented **real-time data integration** that reduced the time to update the admin dashboard by **50%** to provide **up-to-the-minute insights** and **live updates**, enhancing decision-making processes
- **Documenting** and managing **70+ APIs**, optimizing **communication** between **frontend** and **backend** teams.

Research Experience

Data, Systems & High Performance Computing (DaSH) Lab Dec 2023 – present
Undergraduate Researcher | Asynchronous IO, IO_uring, Rust, kernel
- Working under Dr Arnab K. Paul on **asynchronous IO calls** for **key-value stores** for **high performance computing.**

Confluence Lab May 2023 – Dec 2023
Undergraduate Researcher
- Working under Prof. Kunal Kishore Korgaonkar on **integrating C and Rust** codebases, looking for **performance boosts** and **memory safety guarantees**.

Projects

Data Prefetching for Edge Deep Learning workloads Aug 2023 – Dec 2023
Apache Kafka, Tensorflow, Distributed Deep Learning,
- Implemented **prefetching** mechanism to reduce **I/O overhead** and **overall training time**.
- Optmised **convergence time** of deep learning training workloads on **edge devices**.
- Using **Apache Kafka** to stream data from a **distributed file system** to compute nodes

Analysis of Perfomance and Memory Safety for C - Rust Integrations Aug 2023 – present
C, Rust, Cargo, Cxx
- Performing a case study on the **performance** impact of integrating **RUST** into a **C++** code base using the **GNSS-SDR, attempting to identify possible bottlenecks** that can be solved using **Rust**
- Worked on **integrating Cargo** into the **existing CMake** build system to allow for **RUST integration.**
- Exploring different integration approaches, and utilizing the **cxx crate** and **RUST Foreign Function Interface**.
- Employed **massif**, **sysbench**, and **valgrind** for comprehensive **memory** and **CPU performance benchmarking**.

Distributed Computing Mar 2024
Distributed systems, docker containerization, kubernetes, load balancing, automation
- **Distributed Hash-Table** on **Kubernetes**
  - Implemented a **Distributed Hash Table (DHT)** based in a **Chord** format for **key-value** lookup
  - **Containerized** and deployed the application on a **Kubernetes cluster** provided by **Netapp** with a web interface.
- **Parallel file search** using **Docker**
  - Implemented **single-process** and **parallel processing** approaches to efficiently scan through large files by breaking them into chunks
  - Utilized **Docker containers** to scale processing across multiple instances, reducing search time.

Skills

Languages
C/C++, Rust, TypeScript, MySQL, Node.js

Tools and Frameworks
Git and GitHub, Linux, kubernetes, Docker, Docker-compose, Ansible

Libraries
React, React-Redux, Puppeteer, Tokio