





Arnav Gupta

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Education

BITS Pilani, K.K. Birla Goa Campus

2021 – 2025 | India


B.E. (Hons.) Computer Science

Relevant coursework: Distributed Computing (Masters level course), Data Storage Technologies and Networks, Operating Systems, Data Structures and Algorithms, Computer Networks, Database Systems, Object Oriented Programming,

Professional Experience

e6data


Sep 2024 – present | Remote, India

Performance & Research Engineer Internship | Java, OLAP Databases 

- Working on **spill to disk** capabilities for **Joins**, and **Aggregations** for a data lakehouse.

Greenphard Energy


May 2024 – Aug 2024 | Remote, Japan

Simulation Engineer Intern | Rust, Python, Terraform, Docker, AWS, Fargate 

- Developed optimized software solutions, like **TCPModbus protocol**, in **Rust** for **IoT devices**, which was **25% faster** than the Python implementation.
- Implemented a simulation dashboard using **ECR**, using **fargate containers** to deploy new features before pushing it to the production dashboard used by the customers.
- Implemented **Terraform** scripts to **automate aws deployments** and **task revisions**

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**, and created a **user-friendly UI**.
- Enhanced **search functionality** by implementing **data structures**, leading to a **40% boost in search query performance**, positively impacting **user experience**
- Implemented **real-time data integration** that reduced dashboard update time by **50%** to provide **up-to-the-minute insights** and **live updates**.
- **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 | C, Asynchronous IO, IO_uring, kernel, Performance Monitoring

- Working under Dr. Arnab K. Paul  on **intercepting I/O** calls by developing a framework targeting **High performance Computing (HPC) Workloads**
- "**Studying the effects of Asynchronous I/O on HPC I/O Patterns**" is accepted at REX-IO 2024 @IEEE Cluster 

Projects

Distributed Computing

Mar 2024

C++, 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.

Data Prefetching for Edge Deep Learning workloads

Aug 2023 – Dec 2023

Python, Apache Kafka, Tensorflow, Distributed Deep Learning,

- Implemented **prefetching** mechanism to reduce **I/O overhead** and **overall training time**.
- Optimised **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 Performance and Memory Safety for C - Rust Integrations

Aug 2023 – Apr 2024

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**.

Skills

Languages

C/C++, Python, Rust, Java, MySQL, Node.js

Tools and Frameworks

Git and GitHub, Linux, Kubernetes, Docker, Docker-compose, Terraform

Libraries

React, React-Redux, Puppeteer, Tokio