Aryan Agarwal

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EDUCATION

Indian Institute of Technology Kharagpur   July 2019 – April 2024
Bachelor & Master of Technology (Dual Degree) in Computer Science and Engineering   *9.18/10*

EXPERIENCE

Member Technical | D. E. Shaw India Private Limited   June 2024 – Present
Financial Operations Tech   *Hyderabad, India*
- Work on migration to a generic **Digital Signature** (DSC) app in the firm. This app attaches DSC to PDFs of any format for any team in the firm. Worked on the low level design to make it backwards compatible with existing app.
- Redesigned the **file system & vault** to ensure that no unauthorized person can access other's DSC credentials while keeping it easy for us to add new DSCs or PDF formats in future. Handled the infra tasks, write unit tests.
- Built a new application for the **Profit & Loss Reporting** team to streamline multiple workflows, including Management Fees and Form PF reporting for the SEC working closely with FinOp stakeholders & Arcesium.
- Improved our **uni-temporal** library to support bulk insert; upserts/deletes with $\sim$**40% less time** in SQL Server.
- Built the CI/CD using **Kubernetes** & GitHub Actions; file transfer with **GnuPG & SFTP**; utility for **CSV export** an object as using annotations; **deployment scripts** enhancement; **crawler** for backing up keys; **cron job** setups.
- Built service-layer algorithms for workflows/reports tasks; UI with Redux/Redux Toolkit; DB schema; SQL queries.

Software Engineer Intern | D. E. Shaw India Private Limited   May 2023 – June 2023
Financial Operations Tech   *Hyderabad, India*
- Developed a self-service web portal using React-Redux for admins to manage Tax Statement field configurations, reducing developer dependency and turnaround time from 3 days to near-instant.
- Analyzed requirements, identified backend gaps, redesigned the database schema for backward compatibility, wrote SQL migration scripts & created new POJOs supporting bitemporal queries in a layered architecture.
- Implemented algorithms for tokenization, validation, evaluation, storage of tax field formulas; Live statement preview.

PROJECTS

Road Condition Categorisation & Mapping | *Bachelor & Master Term Project*   Jan' 23 – Apr'24
- Developed a **crowdsourcing** based road anomalies detection and mapping app & deployed on the college network.
- Made a web portal for the admins & an **android** app for the end users to CRUD geo-tagged reports.
- Made **heat maps** and range polygons for reported areas using WMS and OpenStreetMap layers in **GeoServer**.
- Designed a **CNN** using PyTorch to help users in image categorisation and used **on-device ML** for faster inferences.
- Used the **PostGIS** extension for PostgreSQL for storing geo-spatial data, Nginx for reverse proxy, Flask for backend tasks, linux file system for uploading images, JWT for authentication, RBAC for authorization & React for frontend.

Networks Programming | *Computer Networks Course Project*   Jan' 22 – Apr' 22
- Implemented a **simplified file transfer protocol** for transferring any file between a concurrent TCP server and a client as chunks of bytes. Implemented login using password, directory traversal & batch download/upload.
- Developed a version of Linux command **traceroute** using raw sockets and modifying the IP/UDP headers.
- Developed a library for supporting **reliable communication over UDP** using acknowledgement and threads.

Systems Programming | *Operating Systems Course Project*   Jan' 22 – Apr' 22
- Developed a **shell** that runs as an application program on top of Linux kernel. Implemented running of external commands, i/o redirection, pipe mode, history search & filename autocomplete using POSIX system calls.
- Simulated **parallel matrix multiplication** as a producer consumer problem using mutex locks & shared memory.

TECHNICAL SKILLS

Languages: C, C++, Java, SQL, JavaScript, Python, HTML/CSS
Frameworks: C++ STL, Spring Boot, JUnit, React, Redux, Node.js, Firebase, Flask, PyTorch
Developer Tools: Bash, Docker, Kubernetes, Maven, Git, Digital Ocean, Nginx, Postman, GitHub Action

AWARDS & ACHIEVEMENTS

- Qualified for ACM-ICPC 2021 Kanpur Regionals (team - ConvexSkulls)
- Ranked **Top 0.44%** with max rating **2397** on **Leetcode***, a coding platform.   (* handle - aryan57)
- Rated **Expert** with max rating **1856** on **Codeforces*** , max rating of 1680 on **Atcoder*** & 2131 on **Codechef***