Pallai Mayank Kumar

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EDUCATION

Nanyang Technological University, Singapore   Aug 2021 – Jun 2025
- B.E. in *Electrical and Electronic Engineering*
- **Specialization**: Computer Engineering
- **Relevant Modules**: Data Structures and Algorithms, Computer Networks
  Data Science and Artificial Intelligence, Introduction to Programming, Engineering Mathematics

SKILLS

- **Programming**: C++, C, Golang, PostgreSQL, JavaScript, TypeScript, Python, HTML, CSS, Matlab
- **Frameworks/Libraries**: NextJS, ReactJS, Tailwind CSS, Material UI, TensorFlow, PySpark, NumPy, Pandas
- **Technologies:** Git, GitHub, BitBucket, Jira, gRPC (Protobufs), Websockets, REST APIs, Redis, Snowflake, Docker, CI/CD, AWS, Postman, Bash, Testing
- **Languages**: Fluent Proficiency in English and Hindi

INTERNSHIP EXPERIENCE

Bluesheets Singapore Pte Ltd,   Jun 2024 – Aug 2024
Full-Stack Engineer Intern
- Optimized the serverless architecture using **AWS Lambda**, achieving a **15% reduction** in infrastructure costs and a **20% improvement** in application deployment speed for automating expense tracking for SMEs in the MVP. Utilized **Bedrock API** to integrate large language models (**LLMs**) for scalable backend operations.
- Developed dynamic frontend components with **ReactJS** for user demos, enhancing the user satisfaction score by **10%** based on onboarding feedback.
- Designed **Python** unit tests to validate the optical character recognition (**OCR**) feature, achieving a **95% accuracy** rate in data processing for financial documents.

Switcheo Labs Singapore Pte Ltd,   Jan 2024 – May 2024
Software Engineer Intern
- Optimized the trading engine for **500+** markets on the perpetual DEX platform, increasing transaction throughput by **15%** and managing **150+** open positions concurrently.
- Leveraged **Golang** for efficient **algorithm design**, **refactoring**, and rigorous **CI/CD testing**, resulting in significant performance enhancements.
- Developed **CLI** commands for streamlined transactions and queries on the **blockchain** using **gRPCs (Protobufs)** and extensive functions written in Golang.
- Facilitated **PostgreSQL** migrations for frequently accessed data, caching them in **Redis** to enhance query efficiency.

Continental Automotive Singapore Pte Ltd,   May 2023 – Aug 2023
ML and Software Intern

PROJECTS

Limit-Order-Book *GitHub*
- Designed a dynamic Limit Order Book in **C** for real-time financial transactions with a focus on achieving **O(1)** efficiency for add, cancel, and execute operations.
- Implemented a **binary tree** structure for buy and sell orders to streamline market activities, ensuring swift data retrieval, and incorporated balancing strategies for dynamic book updates.
- Leveraged **map-based** tracking for orders and limits, enabling instant access to critical market metrics, including the best bid and offer.

Twitter Clone *GitHub*
- Developed a Twitter-like platform utilizing **Next.js 13, Tailwind CSS, TypeScript, Supabase, PostgreSQL**, and **Drizzle ORM**.
- Engineered key functionalities: user authentication, real-time feeds and posts, likes and replies.
- Demonstrated proficiency in **full-stack** development, seamlessly integrating databases and creating dynamic user interfaces.

Machine Learning Research, URECA *GitHub* *Research Paper*
- Conducted 11-month research in non-blind deconvolution for noisy blurred images, employing **Autoencoder** models and **MATLAB's** image processing tools.

LEADERSHIP

NTU Social Impact Catalyst, *Vice-President* (Executive-Committee)   Aug 2023 – May 2024
IEEE NTU Student Branch, *Welfare Director* (Main-Committee)   Aug 2022 – Jul 2023