Maanav Singh

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Education

University of North Carolina at Chapel Hill — Chapel Hill, NC
Bachelor of Science in Computer Science, Bachelor of Science in Mathematics — *Aug 2021 – May 2024*

- **3.95** GPA + **4.0** Major GPA w/ Dean's List
- Teaching Assistant for **Digital Control Theory**
- Teaching Assistant for **Files and Databases**
- **Coursework:** Algorithms, Data Structures, Operating Systems, Parallel and Distributed Computing, Programming Languages, Computer Organization, Computer Systems, Internet Services and Protocols, Files and Databases, Control Theory, Software Engineering, Machine Learning, Numerical Analysis + **a good bit of math**

Experience

Susquehanna International Group — May 2023 – Aug 2023
Software Engineer Intern — *Bala Cynwyd, PA*

- Incoming @ Options Quoting Team
- Improving low latency trading systems in **C++** and **front-office** trader tools in **C#** and **.NET**

Cash App — Sep 2022 – Jan 2023
Machine Learning Engineer Intern — *San Francisco, CA*

- Worked on Recommendations & Incentives Machine Learning Team (RIML) to provide a recommendation micro-service serving **75M+** customers and **1K+ gRPC** requests per second.
- Architected in-house low-latency distributed Recommendation Store for serving offline recommendations with AWS **SQS, Lambda, ElastiCache**, and **DynamoDB** saving **$200K** annually over legacy store.
- Improved logging performance and quality for service ranking engine by storing and querying metrics concurrently with **Snowflake, Datadog**, and **Kotlin**.

Amazon Web Services — May 2022 – Aug 2022
Software Development Engineer Intern — *Seattle, WA*

- Developed in-production customer-impacting features for **AWS Elastic Beanstalk** and **App Runner**
- Automated console localization workflow with **Python** by automatically merging updates and anticipating parsing failures resulting in **90%** reduced engineer intervention.
- Integrated ML recommendation services with **React** and **Angular.js** to simplify customer experience and reduce avg. search arrival times by **14%**
- Engineered persistent preference caching **Node.js** service with **JavaScript** for **250M+** AWS console users.

Projects

LightningPrice | *C++, Python, Linux, Networking* — Dec 2022 – Present

- Developed a **low latency** pricing API to serve the latest prices for shoes and other retail items
- Built using **Python** for web-scraping and other IO bound tasks
- Interoperated with **multi-threaded C++** service to aggregate and query from efficient data structures
- Tuned **Linux** Kernel to disable unnecessary OS interrupts and **benchmarked** C++ code to ensure excellent CPU **cache** utilization resulting in minimized access latency (**<1ms**) and variance (**<50µs**).

Rucket | *Rust, CPython Interpreter, Networking* — April 2023 – May 2023

- Flexibly and performant reliable data transport library for **Python** over **UDP**
- Implemented congestion control, flow control, and re-transmission to control packet loss with **Rust**
- Provides **24%** reduced latency over Ubuntu's TCP Cubic Algorithm after tuning

Technical Skills

Interests: High Performance Computing, Distributed Systems, Fullstack Engineering
Languages: Python, C++, Rust, Java, Kotlin, SQL (Postgres), Typescript/JavaScript, HTML/CSS, Matlab
Tools and Frameworks: Linux, Cuda, FastAPI, Kubernetes, Spark, Tensorflow, PyTorch, AWS, GCP, Azure