Rohan Gupta

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Education

University of Pennsylvania, Philadelphia, PA

Sep 2020 - May 2024

B.S.E. in Computer Science (NETS program)

GPA: 3.98

Notable Coursework: Program Design (A+), Scalable and Cloud Computing, Advanced Algorithms (A+, 2nd in class), DevOps (A+), Computational Linear Algebra (A+), Discrete Mathematics (A+), Data Structures and Algorithms, Artificial Intelligence (G) (A+), Graph Neural Networks (G), Algorithmic Game Theory (A+, 2^{nd} in class). * $G = Graduate \ Level$

Technical Skills

Languages: Python, Scala, Java, C, JavaScript, SQL, Go, Lisp, LATEX

Technologies/Frameworks: Git, Django, Flask, ML Python stack, Kubernetes, Docker, Emacs, Vim

General: Backend Development, Low Latency Distributed Systems, DevOps/MLOps, Data Engineering, Unix

Experience

Stripe, Seattle, WA

May 2022 – August 2022

Software Engineering Intern

- Develop in pure, functional, and highly concurrent Scala to integrate new, Memcached-backed in-memory key-value store with ML Feature Computation code, created to replace AWS-hosted Redis with a projected annual saving of \$7M
- Single handedly architect previously unscoped, large-scale (500+ LoC) optimisations within 2 days leading to 9x end-to-end latency boost. Improved in-memory request batching after finishing project 3 weeks early.
- Work closely with caching team to reproducibly test latency and consistency at 20k+ RPS and millisecond SLA, devise various locking mechanisms to improve write throughput, as well as proactively find and fix bugs in their Java SDK.

NeuroFlow, Philadelphia, PA

June 2021 - Apr 2022

Data Science/Engineering Associate

- Develop an end-to-end NLP and ML labeling, training and prediction pipeline (spaCy, scikit-learn, Flask, FastAPI) to classify patients' risk for severe anxiety/depression using journal entries.
- Work part-time during the school year, leading transition of data stack to follow modern MLOps/DevOps (Docker, K8s, Redis) practices, with cache/model load optimisation using Redis, horizontal scaling, and automated retraining.
- Propose and implement productionisation of data products using an internal and client-facing API for prediction (FastAPI), serving real time requests in < 100ms. Efforts recognized by CTO and included in long-term plan.

Penn Labs, Philadelphia, PA

Oct 2020 - Present

Co-Director/Team Lead/Backend Engineer

- Lead student organisation of 30+ engineers, designers, and business developers to maintain and develop new products (100k+ unique users) for the Penn community.
- Manage projects, recruiting and organise community events (tech talks/social functions); interface with external stakeholders (Penn Admin, Club Council) and sponsors to keep operations running.
- Work at all levels of the stack for Penn's official club repository (Link: Penn Clubs), including developing the backend API (Django/REST Framework), optimising database/cache queries, and managing K8s infrastructure.

Projects

Distributed Machine Learning Pipeline | dist-ml-pipeline

Nov 2021

- Develop a fully model and parameter agnostic Machine Learning infrastructure system (Docker, Kubernetes, **PyTorch**) to deploy and scale ML models with minimal overhead
- Offer a plug-and-play system with inputs as model class and hyparameters at runtime, continuous training using CronJobs, and automated logging to AWS S3 enabling DevOps-adherent ML engineering.
- Integrate support for distributed training workloads using Kubernetes custom resource PyTorchJob (by Google) integrated with CronJobs.

Computational Neuroscience Research | neurogenesis-research

June 2021 - Aug 2021

- Work with Prof. Vijay Balasubramanian and David Kersen (MD/PhD student) to study adult neurogenesis in the olfactory bulb and its impact on odor perception.
- Develop computational models in MATLAB and Python to simulate the integration of new neurons into existing neural network topologies.
- Investigate multiple modes of neuron placement using metrics in **Graph Theory** and **Biostatistics**, and validate through mutual information and decorrelation between odors.