Aayush Gupta

410 Memorial Drive: 432D, Cambridge, MA 02139

aayushg@mit.edu
408 621 8354
aayushg.com
github.com/Divide-By-0
linkedin.com/in/aayushgupta0

EDUCATION

MIT
Class of 2022, 4.8 GPA
Computer Science BS/MS

Saratoga High School
Class of 2018

RESEARCH

A New ECDSA Nullifier Signature Scheme (slides, 2022)

MIT Masters Thesis

- First anonymous, unique identifier for ECDSA, via a ZK-SNARK proof without a secret key
- Cryptographically proved EUF-CMA, secrecy, and uniqueness of scheme on secp256k1

Novel Interpretable Tissue-Specific and Multi-Tissue Transcriptomic Clocks to Infer Aging Mechanisms (bioRxiv, 2020)

- First work to analyze multi tissue age prediction using gradient boosted trees
- Research in team of 3 under Elvira Kiniza in Manolis Kellis lab

Self-attention for Graph Neural Networks in Computational Chem (2019)

Won MIT Generator award for Best Project 2018

- Replaced message passing with query-key-value attention from NLP, on QM9 dataset.

A Decision-theoretic Approach to Detection-based Target Search with a Drone (2017) (arXiv, first author)

Published + presented at 2017 IEEE/RSJ Int'l Conf on Intelligent Robots and Systems (IROS)

- Improved rescue time by 3.3x with reinforcement learning, modeled as a POMDP.
- Used Julia, SARSOP, and Python to build and test on a custom built drone. Led team of 3.

Dynamic Pricing via RL for Multi-Objective Rideshare Optimization (2017)

Presented at BayLearn 2017

- Showed 12% profit increase using reinforcement learning to produce a Pareto curve.

WORK EXPERIENCE

Genesis Therapeutics: Molecular Machine Learning Team (2021)

- Researched new equivariant model architectures using cross products, for drug prediction

ETH University (2021 Winter, Github, Blog Post)

- Wrote and deployed smart contracts for novel zk-snarks for anonymous group posting

NVIDIA AI Intern: Perception Team (2020)

- Used Tensorflow for metrics + superresolution heads. Sped up model evaluation by 10x.
- Tested model performance in Python to discover model bias.

Lipoker.io Founder (2020)

Created lipoker.io, the first videochat poker site with no signup or downloads. Led team of 4.

- Created backend with Flask, SQLAlchemy, PostgreSQL and frontend in React.
- Led team to deploy on Google Compute Engine with Gunicorn and Nginx.
- Grew to 10,000+ monthly sessions and partnerships with gather.town + others

Copysmith AI CTO/Cofounder (2020)

- Recruited + led team of 6 engineers and designers. Created MVP grown to 100+ users.
- Deployed generative NLP model in Pytorch with AWS and Cortex, scalable up to 100K users.

Scale AI Intern (2019)

- Modeled untrusted labelers for 95% confidence interval on bounding boxes
- Reduced LIDAR labeling errors by 8% with new incentives in React, SQL, TS, Python

Auto-LaTeX Equations Creator (2015-19)

Over **10,000,000** weekly users , 4.0+ star rating.

- Coded and branded a new Google Docs add-on for LaTeX equations.

AWARDS

USA Computing Olympiad National Camp Finalist (2016)
Top 28 pre-college competitive programmers vying for team USA spot. Mastered algorithms like dynamic programming, binary trees, and graph theory in C++.

Putnam Top 500 Math Undergrad (2018)

USA Junior Math Olympiad (2016)
Top 200 of > 70,000 students.

USA Physics Olympiad Silver (2017)
Top 150 physics students in the USA.

Boston Datathon Winner 3rd (2019)

North American Computational Linguistics Olympiad Finalist (2016)
Top 50 in USA.

PROJECTS

Hack Lodge Organizer (2019)

MIT Applied ML Labs Founder ('20)

Research in Sontag Lab (2021)

Zk Message Board (2021)

Securiti.ai Winter Intern (2019)

LANGUAGES

Python, Pytorch, JS, C, C++, Java, Rust, Go, Julia, Solidity, Circom

MIT CS COURSEWORK (4.8 GPA)

Graduate
6.824: Distributed Systems
6.871: ML for Healthcare
6.172: Performance Engineering
6.864: Graduate NLP
6.867: Graduate Machine Learning
6.438: Algorithms for Inference
6.890: Deep Learning + Algorithms
6.857: Cryptography and Security

Undergraduate
6.047: Computational Bio
6.036: Intro to Machine Learning
9.66: Computational Cogsci
6.033: System Design
6.046: Advanced Algorithms
6.041: Probability
18.100B: Real Analysis
8.041: Quantum Physics I
6.03: EECS for Medical Devices
6.UAT: Communication
6.004: Computation/Assembly