Tarushii Goel

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Education

Massachusetts Institute of Technology GPA: 5.0/5.0

Computer Science and Engineering (6-3) Aug 2022 - Jun 2026

Systems & Performance	**Probability and Modeling (Grad Level)**	**Theoretical CS (Grad Level)**
Software Performance Engineering	Bayesian Modeling and Inference	Advanced Algorithms
Distributed Systems	Inference and Information	Theory of Computation
Interpreter Design	Discrete Probability and Stochastic Processes	

Teaching Experience: TA for Compilers (Spring 2024), LA (Learning Assistant) for Computer Architecture (Fall 2023) (also earned 2nd place out of 80+ students in an open-ended project related to HW/SW co-optimization and processor pipeline design while taking this class)

Awards: Battlecode 2024 4th Place (AI Strategy competition), 3rd place TreeHacks 2023 InterSystems IntegratedML Challenge

Thomas Jefferson High School for Science and Technology GPA: 4.58/4.0

Alexandria, VA Aug 2018 - Jun 2022

Awards: Silver Medalist European Girls Olympiad in Informatics, USA Computing Olympiad Camper, USA Physics Olympiad Exam Qualifier

Work Experience

Radix Trading LLC Jun 2025 - Present

Quantitative Technology Intern

- Developed a market-making trading strategy and researched price signals with ML and traditional data analysis.
- Optimized trade execution latency through intelligent caching of hot path code through regularly scheduled warmups. Developed profiling for distributed workloads.

Modal Labs Dec 2024 - Jan 2025

Software Engineer Intern

- Added a security feature to web endpoints, working with Modal's HTTP proxy server and PostgreSQL/Redis database management. Adopted by 70% of users.
- Upgraded the gVisor container runtime to support NVIDIA video capabilities by adding safe implementations of NVIDIA driver syscalls.
- Investigated RDMA technologies such as GPUDirect and HPC networking solutions for multi-node GPU training in the cloud.

NVIDIA Sep 2024 - Nov 2024

Deep Learning Performance Engineer Intern

- Implemented fusions for CUTLASS Blackwell kernels, developed expertise in C++ compile-time optimization, and dicovered/reported suboptimal code compilation.

Reliable Robotics Jun 2024 - Aug 2024

Software Engineering Intern

- **Data Collection:** Provided support for high-rate data logging of actuator control loops with C++ device drivers, raw socket programming, and IPC with ZeroMQ.
- **Performance:** Debugged blocking syscalls and synchronization issues affecting performance.

Windsurf (prev. Codeium) Jun 2023 - Aug 2023

Software Engineer Intern

- **Machine Learning:** Wrote a distributed model training framework for their large language models in PyTorch. Improved inference speed 2x with kernels for accelerated matrix operations (e.g. row normalization, quantized matmul), building on NVIDIA's CUTLASS library.
- **Product Development:** Built a plugin for their code-completions product for Sublime Text with 10k+ downloads
- **Data Processing:** Designed a hashing algorithm to search 4TB of data with minimal latency. Developed Map-Reduce primitives.

Research Experience

MIT CSAIL Lab Feb 2025 - Present

Student Researcher Supervisor: Dr. Yoon Kim

- Collaborated on developing a new state-space model with log-linear time complexity. Wrote efficient training kernels for our novel chunk scan algorithm and performed model evaluations. Our paper was recently released as a preprint.

Joint Quantum Institute Jun 2022 - Aug 2022

Research Intern Supervisor: Dr. Alexey Gorshkov

- Used the Cramer-Rao bound to research the use of photonic sensors for estimating unknown parameters. Paper in Physical Review Research.

Dartmouth-Hitchcock Medical Center Jun 2021 - Aug 2022

Machine Learning Intern Supervisor: Dr. Joshua Levy

- Developed an tool for Mohs Skin Surgery that gives real-time guidance to pathologists in locating cancer
- Implemented Mask-RCNNs and graph neural networks for nuclei segmentation and classification in tissue images
- Produced several technical papers: ArcticAI, Assessing Colorectal Tumors, AI in Pathology

Skills

Programming Languages: C/C++, Python, Rust, Go, Javascript (React.js, Node.js), Bash, Java, Julia, CUDA, VHDL, Mathematica

Technologies: Git/GitHub, PyTorch, Containers (Docker/gVisor), Linux, AWS/GCP/OCI, Perfetto, Apache Arrow/Spark, HTML/CSS, Android Studio, Arduino