

# TARUSHII GOEL

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## EDUCATION

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### Massachusetts Institute of Technology

Computer Science and Engineering (6-3)

GPA: 5.0/5.0  
Aug 2022 - Jun 2026

#### Compilers, Hardware, & Systems

Software Performance Engineering  
Interpreter Design  
Computer Architecture  
Computer Systems Security

#### Applied Probability (Grad Level)

Inference and Information  
Discrete Probability and Stochastic Processes  
Fundamentals of Probability

#### Theoretical CS (Grad Level)

Advanced Algorithms  
Theory of Computation  
**Other**  
Quantum Physics

**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), 1st place iQuHACK 2023 Quantum Challenge, 3rd place TreeHacks 2023 InterSystems IntegratedML Challenge, Prysman Women in STEM Scholarship Winner

### Thomas Jefferson High School for Science and Technology

Alexandria, VA

GPA: 4.58/4.0  
Aug 2018 - Jun 2022

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

## WORK EXPERIENCE

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### NVIDIA

Deep Learning Performance Engineer Intern

Sep 2024 - Present

· Improving the CUTLASS library of high performance kernels for NVIDIA's latest architecture, Blackwell.

### Reliable Robotics

Software Engineering Intern

Jun 2024 - Aug 2024

- **Data Collection:** Wrote device drivers to interface with various sensors gathering flight data. Provided software support for high-rate data logging and analysis for tuning of actuator control loops with low-level C++, raw socket programming, and IPC with ZeroMQ.
- **Performance:** Integrated profiling tooling and debugged blocking syscalls and synchronization issues affecting performance
- **Infrastructure:** Reduced CI speed by 30% by optimizing AWS instance types for specific workloads. Implemented docker image caching.

### Codeium

Software Engineer Intern

Jun 2023 - Aug 2023

- **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), modifying NVIDIA's CUTLASS library.
- **Product Development:** Built a [plugin](#) for their code-completions product for Sublime Text with 7k+ downloads
- **Data Processing:** Designed a hashing algorithm to search 4TB of data with minimal latency. Developed Map-Reduce primitives.

### Quera

Algorithms Intern

Jan 2023 - April 2023

- Tested novel approaches to quantum reservoir computing. Demonstrated quantum advantage in problems in [VLSI](#) and time scheduling.

## RESEARCH EXPERIENCE

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### Joint Quantum Institute

Research Intern

Jun 2022 - Aug 2022  
Supervisor: Dr. Alexey Gorshkov

- Used the Cramer-Rao bound to research the use of photonic sensors for estimating unknown parameters. Paper on [arXiv](#).

### Dartmouth-Hitchcock Medical Center

Machine Learning Intern

Jun 2021 - Aug 2022  
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

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

**Technologies:** Git/GitHub, Docker, Linux, AWS, Apache Arrow/Spark, HTML/CSS, Android Studio, Arduino