

# Prasham Shah

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## Education

### Harvard College

A.B. Computer Science & Mathematics

May 2030

Cambridge, MA

## Experience

### Dorm to Door Student Storage | *React, Firebase, Stripe, Node.js, TypeScript*

2025 – 2026

Software Engineer

Remote

- Architected and shipped full-stack platform for summer-storage startup operating across **17+ campuses** nationwide, owning both the React frontend and Node.js backend, integrating Firebase, Stripe & OAuth
- Engineered delivery-routing infrastructure using **graph-based optimization algorithms** to minimize route cost and coordinate complex, multi-stop pickup/drop-off schedules at scale
- Built out admin systems, real-time database sync, and authentication with an emphasis on accessibility and mobile UX, supporting **live production traffic** across the full 2025 season

## Research

### New Jersey Governor's School in the Sciences | *Scikit-learn, NumPy, SymPy, Pandas, Python*

Summer 2025

Lead Machine Learning Researcher

Madison, NJ

- Led CS research team as **1st author** on IEEE paper, winning **Best Poster at MIT URTC (1st of ~700 submissions)**
- Trained and evaluated deep **neural networks** to recover closed-form, human-interpretable equations from raw, multivariate physics datasets
- Designed a novel **adaptive-alpha** technique for the neural-network symmetry-detection subroutine, reducing false positives by **10x** over prior state-of-the-art system

### Cambridge Open Engage | *Multimodal LLMs, OpenCV, Statistical Analysis, Python, Linux*

2024 – 2025

Independent Machine Learning Researcher

Remote

- Benchmarked 3 LLMs, including a **self-hosted LLaVA model**, across **120 custom prompts** (control, noisy, and classically denoised variants)
- Quantified model robustness to real-world noise types: textual (misspellings) & visual (**Gaussian, salt-and-pepper, speckle**)
- Demonstrated statistically that MLLMs are less noise-resistant than text-only LLMs on text prompts, that **classical denoising pipelines degrade accuracy** on both modalities, and smaller models show disproportionately higher sensitivity

## Projects

### Legal Lieutenant | *Firebase, OAuth, GPT fine-tuning, NLP Pipelines, EJS, Express, JavaScript*

2026

- Led team to develop AI-powered legal assistant targeting U.S. immigrants — **1st place** at Empower Hacks 2.0 (**2,000** international competitors, **\$210K** prize pool)
- Built **custom NLP chunking pipeline** for legal document ingestion, fine-tuned GPT layer for domain-specific Q&A and summarization, and hand-rolled standards-compliant authentication

### SocialScanner | *PyTorch, Computer Vision, NLP, Web Scraping, Parallel Computing, Python*

2025

- Designed privacy-first, ML-powered mental-health screening system for schools — **adopted by Northern Burlington HS** administration and presented at a national TSA conference
- Developed one-model-per-metric architecture to enable granular activation of only desired signals (social media text/images, grades, counselor transcripts, etc.); used **parallel computing** to generate counselor reports in bulk

### Ultra Ball | *WebSockets, SvelteKit, Behavior-Tree AI, TypeScript*

2024

- Crafted real-time multiplayer web game from scratch — grew organically to **200+ daily active users** months post-launch
- Deployed fully custom, client-agnostic **WebSocket server**, resolving complex move interactions, managing **bot AIs** with randomized personalities and behavior trees, and automating lobby lifecycle

## Additional Honors

**Lockheed Martin Code Quest:** 3rd place, Advanced Division, inter-state algorithmic coding competition

**U.S. Presidential Scholar:** 1 of 500 national semifinalists (top 0.01% of eligible students)

**Stamps Scholarship at Georgia Tech:** 1 of 430 national semifinalists (top 1% of applicants)

## Technical Skills

**Languages:** Python, TypeScript, C++, Java, Rust, Go, SQL, HTML/CSS, Bash

**Frameworks & Libraries:** React/Next.js, SvelteKit, Node, Express, PyTorch, Scikit-learn, NumPy, SymPy, OpenCV, Pandas

**Technologies:** GCP/Firebase, AWS (S3 & EC2), OAuth, REST APIs, WebSockets, LLM fine-tuning, Git, Linux

**Concepts:** Parallel computing, graph algorithms, statistical benchmarking, data-driven optimization