

# Soham Jain

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## Education

### Carnegie Mellon University

May 2028

B.S. in Computer Science, Concentration in Machine Learning

Pittsburgh, Pennsylvania

- **Relevant Courses:** Data Structures and Algorithms, Computer Systems, Functional Programming, Discrete Math, Linear Algebra, Multivariable Calculus, Artificial Intelligence, Machine Learning, Computer Vision, Mobile and Web Application Development

## Technical Skills

**Languages and Operating Systems:** Python, Java, C, C++, HTML/CSS, JavaScript, TypeScript, SQL, MATLAB, Linux, Windows, macOS

**Developer Tools:** Git, Docker, Vim, VS Code, AWS EC2, MongoDB, Google Cloud, Firebase, Android Studio, Expo, Figma, PostgreSQL

**Libraries & Frameworks:** React, Vite, Express, Node.js, Next.js, Flask, NumPy, Pandas, TensorFlow, PyTorch, Keras, OpenCV

## Experience

### Vytal.AI

May 2022 – Dec 2024

Software and Machine Learning Engineer

Alexandria, Virginia

- Used **OpenCV** and **React Native** to develop a smartphone AI application that quantifies brain health in just **30 seconds** via novel eye-tracking software at VC-backed startup.
- Optimized **Python** biometric pipelines and deployed ML models on **AWS EC2** to scale testing to **300+ clinical beta users**.
- Created a head-gaze classification algorithm with **YOLOv8** that achieved **15% higher accuracy** than previous models.

### Virginia Tech

April 2024 – May 2025

Computer Science Research Intern

Blacksburg, Virginia

- Spearheaded research with Dr. Atul Mantri on applying Grover's algorithm to solve boolean SAT problems **quadratically faster**.
- Utilized **Python**, **MATLAB**, and **Q#** to build a quantum-classical hybrid algorithm to address the graph coloring problem on a map of the 50 U.S. states, **reducing computation cost by 65%** compared to classical recursive methods.

## Projects

**RoutineRemind** | React, JavaScript, TypeScript, Python, HTML/CSS, Firebase

June 2022 – Present

- Developing **patent-pending** app that uses **NLP** and **audio classification** to create personalized schedules for children with autism.
- Scaling product to over **400 active users** through clinical partnerships and integration in local schools.
- Recognized as **first place in the Congressional App Challenge (top 4%)**; demoed app to Representatives at Capitol Hill.

**CMUEats** | TypeScript, Vite, React, Vanilla CSS, Elysia, Railway

Aug 2025 – Present

- Implementing live API data from Dining Services into a website that streamlines menus and specials for **10,000+ users monthly**.
- Leading the integration of a geospatial routing system using **REST APIs** and **Apple Maps** to sort dining locations by walking distance.

**EyeLS** | JavaScript, HTML/CSS, Python, TensorFlow, OpenCV

Aug 2023 – Sep 2025

- Constructed a gaze-tracking application that maps eye movements to click locations with **92% calibration accuracy**, enabling patients with neurodegenerative disorders like ALS to communicate nonverbally while **saving over \$15,000 annually**.
- Awarded **IEEE Technical Excellence** for using **ridge regression** and **Monte-Carlo Kalman Filtering** to refine gaze predictions.

## Research & Publications

**LapseNet: A Hybrid CNN-LSTM Approach for Accurate and Efficient Vision-Based Fall Detection**

Nov 2024

6th International Conference on Robotics and Computer Vision

- Designed a lightweight neural network with **TensorFlow** and **Keras** to detect indoor falls with **99%+ accuracy across four datasets**.
- Earned the **Best Presentation Award** for exceptional oral and poster demonstration (**top 1.5%** of 500+ participants).

**A Transformer-Based Approach to Diagnose ALS via EEG Analysis**

Feb 2025

17th International Conference on Advanced Computer Theory and Engineering

- Optimized a Transformer-based model on **three A100 GPU instances** to capture spatial-temporal dependencies in EEG recordings, accelerating ALS diagnosis **from 8-15 months to under 2 minutes** while maintaining **98%+ accuracy**.

**RexDash: A Dashboard for Analyzing Replica Exchange Molecular Dynamics Simulations**

Oct 2023

Journal of Student-Scientists' Research (George Mason University Aspiring Scientists Summer Internship)

- Built the first **Flask** and **HTML** dashboard to standardize metrics for analyzing molecular dynamics simulations' performance.