Neiv Gupta

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Education

University of California, Los Angeles — Los Angeles, CA
Bachelor of Science in Computer Science — *Expected June 2027*

- Relevant Coursework: Discrete Structures, Data Structures, Computer Organization, Software Construction
- Activities: Association for Computing Machinery–Artifical Intelligence, Nova–Tech for Good, Glitch UCLA

Projects

CudaFire | *CUDA, C++17, CMake, GDAL, OpenGL* — Dec. 2025 – Present

- Built GPU-accelerated wildfire spread simulator using **CUDA** and the **Rothermel** fire behavior model.
- Processed **8.7 million terrain cells** in parallel using **8-connected cellular automaton** on RTX 3080.
- Optimized CUDA kernels with 16×16 thread blocks, achieving **7,643× real-time** simulation performance.
- Integrated GeoTIFF terrain ingestion via **GDAL** and real-time **OpenGL** 3D visualization pipeline.

BruinMarket | *Go, React, PostgreSQL, WebSockets, Docker, Railway, Vercel, NPM* — Oct. 2025 – Nov. 2025

- Launched full-stack UCLA-exclusive student marketplace with real-time peer-to-peer transactions and messaging.
- Architected backend using **Go** with **PostgreSQL** database and **JWT** authentication and email verification.
- Deployed production app on **Railway** and **Vercel** with custom domain configuration and **CI/CD** pipeline.

YUM | *React Native (Expo), Node.js, Express.js, MongoDB Atlas, REST APIs, NPM* — Mar. 2025 – Jun. 2025

- Developed UCLA mobile dining app providing live dining updates, commenting workflows, and personal profiles.
- Architected full-stack **MERN** mobile app with **JWT**-based authentication and real-time state synchronization.
- Implemented **RESTful API** endpoints with Express.js middleware and **MongoDB** aggregation pipelines.

Stairmasters | *Swift* — Aug 2024 – Dec. 2024

- Developed Swift iOS accessibility app helping UCLA students with disabilities find accessible campus routes.
- Leveraged Apple's MapKit framework with **MKDirections API** for accessible route calculations and navigation.
- Mapped elevator access points using Swift Core Location framework for wheelchair-accessible campus navigation.

Experience

Software Engineering Intern — Apr. 2025 – Sep. 2025
ThinkScan Technologies — *Pleasanton, CA*

- Developed AI Agent integrating **YOLOv11** and **OCR** pipelines for object detection and scene reasoning.
- Improved inference accuracy by **34%** with average latency reduced to **25** ms per frame on Apple M3 Silicon.
- Optimized TinyLlama to scale inference using MLX on Apple M3, reducing latency **22%** and power **14%**.
- Engineered image quality assessment using **Laplacian variance** and bilateral filtering for noise detection.

Computer Vision Researcher — June 2024 – Aug. 2024
Argonne National Laboratory — *Lemont, IL*

- Deployed **TensorFlow/PyTorch** CNN models on ARM Cortex-A78 edge nodes for environmental monitoring.
- Built high-performance **CLIP**-based zero-shot classification achieving **93%** mAP across 12 environmental classes.
- Implemented model optimization techniques including **quantization**, reducing edge deployment time.
- Fine-tuned **OpenCLIP ViT-B/32** models on domain-specific environmental datasets for improved accuracy.

Geographic Information Systems Intern — Apr. 2023 – Aug. 2024
Northern Change Research Laboratory, Brown University — *Providence, RI*

- Executed **ResNet-50** transfer learning with TensorFlow/PyTorch, processing Sentinel-2 multi-spectral imagery.
- Engineered data pipelines using GDAL/Rasterio, creating **15K+** labeled training samples via QGIS digitization.
- Achieved **14%** accuracy improvement using **U-Net** segmentation architecture with focal loss optimization.
- Quantified glacial ice loss contributing to **sea level rise** projections using **geodetic mass balance** calculations.

Student Researcher — Nov. 2021 – Nov. 2023
Doer School of Sustainability, Stanford University — *Palo Alto, CA*

- Implemented **Random Forest** and **XGBoost** learning algorithms for Sierra Nevada tree species classification.
- Achieved **96%** classification accuracy using ensemble methods on **100,000+** labeled forest imagery samples.
- Developed **LSTM RNN** architecture for wildfire progression prediction from multi-spectral satellite imagery.
- Integrated NOOA meteorological APIs and topographical datasets for enhanced feature engineering processes.

Technical Skills

Languages: Java, Python, C, C++, Go, JavaScript, TypeScript, HTML/CSS, XML, JSON, Swift, Bash, SQL
Frameworks: PyTorch, TensorFlow, LangChain, React, React Native, Node.js, Express.js, Gin, Apple MLX
Developer Tools: Git, Github, Docker, Railway, Vercel, REST APIs, WebSockets, MongoDB Atlas, PostgreSQL, NPM
Libraries: NumPy, pandas, Matplotlib, Scikit-learn, OpenCV, CLIP, OpenCLIP, YOLO, XGBoost, Tailwind CSS