

Tarun Upadhyay

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EDUCATION

University of California, San Diego (UCSD)

San Diego, CA

B.S. in Computer Science (GPA: 3.9)

Expected June 2027

- **Honors:** Chancellor's Honor List (2024–2025); Provost Honor List; Dean's Honor List
- **Selected Coursework:** Advanced Data Structures, Design of Operating Systems, Machine Learning: Learning Algorithms, AI: Probabilistic Models, Systems Programming, Computer Networks

EXPERIENCE

Undergraduate Researcher

April 2026 – Present

UCSD – Prof. Prasad Gudem's Lab

- Building a reinforcement learning framework using Large Language Models (LLMs) and netlist verification tools to automate novel circuit invention.
- Engineered Python pipelines interfacing with Cadence CLI to execute automated verification, value checks, and retrieval on generated netlists.

Argano

Aug. 2026 – Sept. 2026

Software Engineering Intern

- Built Boomi AtomSphere integrations (XML, JSON, Flat File, Database) with Branch, Decision, and Route logic using EAI and REST connectors.
- Implemented dynamic routing, document caching, and Groovy transformations to improve pipeline flexibility and throughput.

Transnode AI LLC

March 2026 – May 2026

Software Engineering Intern

- Executed 20+ full-stack features and infrastructure improvements across PostgreSQL and Supabase backends.
- Architected key application workflows, including candidate profile approval systems and employer order verification.
- Integrated Stripe promotional pricing, pay-as-you-go billing APIs, and PostHog analytics for tracking user behavior.

Qualcomm

June 2025 – Aug. 2025

Interim Engineering Intern - SW

- Engineered a real-time Driver Monitoring System using Python, TensorFlow, PyTorch, and GStreamer on an IoT device.
- Implemented vectorized cosine similarity across face datasets for driver identification alongside object detection for drowsiness and distraction detection.

Assistant Research Student

Oct. 2024 – June 2025

UC Riverside – Prof. Hamed Mohsenian-Rad's Lab

- Streamlined GridSweep sensor data ingestion by building MATLAB scripts to automate Google Cloud Platform (GCP) bucket management.

PROJECTS

Seed Counter (Automated Grain Phenotyping Pipeline) | Python, PyTorch, FastAPI, OpenCV, CUDA

- Deployed a multi-service computer vision platform using YOLOv12, SAM2 segmentation, and OpenCV for grain phenotyping with automated metric calibration.
- Packaged independent services behind a unified FastAPI hub featuring CUDA-aware model warmup and real-time REST API inference.

Minecraft Autonomous Agent | Python, Reinforcement Learning, REST APIs

- Trained a model-based RL agent using Value and Policy Iteration to autonomously traverse a complex tech tree without human sub-goals.
- Discretized a high-dimensional REST API observation space and designed multi-stage reward functions with decay exploration.

Pearl Millet QTL Mapping Pipeline | Python, qtl2, Data Analysis

- Built an end-to-end genomic mapping workflow in Python and R to process SNP genotype data and run 1,000 permutation trait scans.
- Identified significant disease-resistance loci ($LOD \approx 7.1$) and generated publication-ready visualization diagnostic reports.

TECHNICAL SKILLS

Languages: Python, C, C++, TypeScript, JavaScript, PL/pgSQL, ARM, x86, MATLAB

Backend & Cloud: REST APIs, Distributed Systems, Stream Processing, Google Cloud Platform (GCP), Linux, Stripe API, Supabase

Developer Tools: Git, GDB, Valgrind, Docker, PyTorch, TensorFlow, OpenCV, Dell Boomi

Certifications: Dell Boomi Professional & Associate Integration Developer