

YUVRAJ SHIV

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EDUCATION & COURSEWORK

UC Berkeley — B.S. Electrical Engineering & Computer Science

Expected May 2028

- Relevant Coursework: Artificial Intelligence & Machine Learning (CS 188), Database Systems (CS 186), Computer Networks (CS 168), Data Structures & Algorithms (CS 61B), Computer Architecture (CS 61C), Structure & Interpretation of Programs (CS 61A), Designing Information Devices & Systems I and II (EECS 16A / 16B); Key Concepts: Machine Learning, Reinforcement Learning, Bayesian Inference, Probabilistic Modeling, Linear Algebra, SQL & Relational Algebra, Signals & Systems

Riverside City College / Norco College — Dual & Concurrent Enrollment

August 2021 – May 2024

- Completed 40+ units of advanced math, computer science, and physics coursework concurrently with high school; maintained 4.0 GPA

EXPERIENCE

Machine Learning Intern, Altametrics — Costa Mesa, CA

March 2025 – Present

- Architected and deployed production ML forecasting pipelines in Python using Random Forest, XGBoost, LightGBM, CatBoost, Prophet, and TimesFM (foundation model) to predict daily sales across 4 major QSR chains — McDonald's, Taco Bell, Jack in the Box, and Chipotle — covering thousands of restaurant locations
- Reduced sales forecast error from 12% to 5% (a ~58% relative improvement), translating into tighter labor scheduling, food-cost control, and reduced overtime spend across production deployments
- Engineered 30+ predictive features from structured and unstructured data sources — weather, zip-code demographics, holidays, seasonality, school calendars, and national events — and integrated macroeconomic indicators (CPI, unemployment) to lift prediction accuracy
- Owned end-to-end model lifecycle — data preprocessing, feature engineering, hyperparameter tuning via cross-validation, back-testing on 2+ years of historical data — and collaborated cross-functionally with operations and data engineering teams to translate forecasts into actionable labor-scheduling recommendations

Software Intern, MAG Services — Costa Mesa, CA

May 2023 – August 2023

- Built Java-based data-analysis tooling that processed 12+ weeks of restaurant sales and labor-cost data to surface scheduling inefficiencies across 20+ locations
- Designed a labor-optimization playbook adopted by operations managers that cut overtime pay and eliminated unprofitable shifts, projected to save thousands in monthly labor cost
- Delivered 15+ analytical reports, dashboards, and stakeholder presentations using SQL and Microsoft Office across 20+ recurring meetings

Semiconductor Research Intern, UC Santa Cruz (COSMOS) — Santa Cruz, CA

July 2023 – August 2023

- Selected for the competitive COSMOS summer research program at the Baskin School of Engineering; researched device physics of LEDs, transistors, solar cells, and memristors, and led a 4-person team to design and prototype a 4-watt solar panel
- Authored and presented a technical project on memristor applications in neuromorphic computing and ML hardware acceleration

PROJECTS

Pac-Man AI Agents — CS 188 Artificial Intelligence (Python, NumPy)

Spring 2026

- Implemented search (DFS, BFS, UCS, A* with custom heuristics), multi-agent adversarial search (minimax, alpha-beta pruning, expectimax), and reinforcement-learning agents using value iteration, Q-learning, and approximate Q-learning with feature-based linear function approximation
- Trained Bayesian networks and Hidden Markov Models for probabilistic ghost localization under noisy sensor observations; implemented a Naive Bayes digit classifier from scratch achieving 80%+ accuracy on held-out test data

RookieDB — Relational Database Management System, CS 186 (Java, SQL)

Fall 2025

- Implemented core RDBMS internals including B+ tree indices, hash joins, sort-merge joins, and grace hash joins in a 10,000+ LOC SQL database engine
- Built a cost-based query optimizer using dynamic programming over join orderings and selectivity estimates; engineered ARIES-style crash recovery (write-ahead logging, ACID-compliant rollback / redo) and multi-granularity 2-phase locking for safe concurrent transactions

Gitlet — Distributed Version Control System, CS 61B (Java)

Spring 2025

- Built a Git-like version control system from scratch (~3,000 LOC) supporting init, add, commit, log, branch, checkout, merge, reset, and remote operations; used SHA-1 content-addressable storage and implemented 3-way merge with conflict detection via lowest-common-ancestor traversal

CS61CPU — 32-bit RISC-V Processor, CS 61C (Logisim, RISC-V Assembly, Bash)

June 2025 – August 2025

- Designed a 32-bit RISC-V CPU in Logisim with an ALU (add, sub, shifts, bitwise, multiply), 32-register file, and immediate generator; built a single-cycle datapath supporting 30+ R/I/S/B/U/J-type instructions via ROM-based control logic
- Automated correctness verification with Bash-driven testbenches against custom RISC-V assembly programs

Treble Boost Guitar Effects Pedal — EECS 16B (Analog Circuit Design, SPICE)

Spring 2026

- Designed an op-amp-based treble-boost guitar pedal: hand-derived the symbolic transfer function for a bandpass topology and selected RC values targeting ~10× voltage gain across a 300 Hz – 15 kHz passband; prototyped on a breadboard with bypass capacitors and soft-clipping diodes for noise rejection, then validated against SPICE simulations and oscilloscope / network analyzer measurements driving a live guitar amplifier

LEADERSHIP & COMMUNITY IMPACT

AP Calculus AB / BC Teaching Assistant — Hillcrest High School, Riverside, CA

August 2022 – June 2023

- Supported instruction and grading for 145 students across two AP Calculus sections; authored solution sets for 20+ unit tests and managed a Google Classroom of daily lecture notes and review materials

President, Hillcrest High School Math Club — Riverside, CA

August 2021 – June 2024

- Founded and grew the club to 60+ active members; organized weekly meetings, curated AMC / AIME-style practice materials, mentored a 3-member exec board, and ran 5+ fundraisers that financed math-textbook donations to under-resourced schools

Volunteer, American Red Cross (Southern California Chapter)

September 2022 – June 2024

- Installed 1,000+ smoke alarms across 250+ homes via the Sound the Alarm program; helped coordinate an ARC Expo for 200+ community members and supported 4+ blood drives

LANGUAGES & TECHNOLOGIES

- **Languages:** Python, Java, C, SQL, JavaScript, HTML / CSS, RISC-V Assembly, R (intro)
- **ML & Data Libraries:** Pandas, NumPy, scikit-learn, XGBoost, LightGBM, CatBoost, Prophet, TimesFM, Matplotlib, Jupyter
- **ML / AI Concepts:** Feature Engineering, Hyperparameter Tuning, Cross-Validation, Time-Series Forecasting, Gradient Boosting, Random Forest, Naive Bayes, k-Means, PCA, Reinforcement Learning (Q-learning), Bayesian Networks, Hidden Markov Models, A* Search, Minimax
- **Developer Tools:** Git, GitHub, Linux / Bash, REST APIs (intro), VS Code, IntelliJ, Logisim, Microsoft Excel
- **Practices:** Agile Collaboration, Code Review, Cross-Functional Communication, Technical Documentation, Test-Driven Development

AWARDS & RECOGNITION

- AP Scholar Award (College Board, 2023) • California Scholarship Federation Lifetime Member • National Honor Society (11th & 12th Grade) • Alvord USD Science Fair Winner (2019) • La Sierra University Robotics Competition Winner (2018)