Aarav Jamdar

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Education

University of California, Berkeley — Berkeley, CA
B.A., Applied Mathematics & Data Science — *Expected Graduation Date: May 2030*
- **Coursework:** Data C8, CS61A, Math 55

Leland High School — San Jose, CA
High School Diploma, GPA: 3.92/4.0 — *Aug 2022 – May 2026*
- **Relevant Coursework:** AP Calculus BC, AP Statistics, Multivariable Calculus (DE), Differential Equations (DE), Linear Algebra (DE)
- **Honors:** NSDA Academic All American; Congressional Award Silver Medal; Ranked 4th/18,000 nationally in Public Forum Debate (3rd at Cal, 7th at NSDA Nationals, 2× Gold TOC)

Research & Technical Experience

University of California, Santa Barbara — Jun 2025 – Jul 2025
Summer Research Academy — *Santa Barbara, CA*
- Designed 3D aerodynamic vehicle models inspired by falcon wing anatomy using computational modeling tools
- Ran CFD simulations that improved drag efficiency by 14% over industry baseline designs; validated simulation results against physical wind-tunnel prototypes
- Co-authored a research paper and presented findings at a capstone seminar to 200+ attendees

Cambridge University — Jun 2024 – Dec 2025
Student Researcher — *Remote*
- Conducted independent research on sustainable transportation systems under the mentorship of Dr. Jordi Ferrer
- Designed computational simulations, collected and analyzed experimental data, and authored a full research manuscript
- Paper accepted and published in the Journal of Emerging Investigators (JEI), a peer-reviewed STEM journal with a ∼30% acceptance rate

Projects

RL Trading Agent | *Python, PyTorch, Alpaca API, GitHub Actions* — Aug 2026 – Present
- Deployed a frozen DQN policy for live, unattended paper trading via Alpaca API on a daily GitHub Actions schedule, with a risk layer (manual + automatic drawdown kill switch, equity-capped position sizing) to prevent uncontrolled losses
- Implemented the underlying Deep Q-Network from scratch (Q-network, experience replay, Polyak-averaged target network), validated on CartPole-v1, then extracted into a reusable, environment-agnostic Agent class
- Trained on a custom SPY trading environment with a strict chronological train/validation split; diagnosed via direct action-distribution inspection that the learned policy converges to a buy-and-hold-equivalent strategy

EquiFace v2 – Facial Recognition Bias Audit | *Python, PyTorch, fastai, pandas* — May 2025 – Jul 2026
- Trained a ResNet18 gender classifier via transfer learning on FairFace (28,000 training images stratified across 7 races × 2 genders), achieving 88.09% accuracy on a 5,600-image non-overlapping held-out set
- Audited the trained model for demographic bias using bootstrap-resampled confidence intervals, per-race TPR/FPR gap analysis, and a statistically significant two-proportion z-test
- Built a custom stratified sampler to guarantee exact per-subgroup image quotas

Statistical Arbitrage Backtester | *Python, pandas, statsmodels, yfinance, pytest* — Jul 2026
- Tested candidate stock pairs for cointegration and derived hedge ratios via OLS regression to construct a market-neutral spread
- Simulated long/short positions from a rolling z-score with look-ahead-bias correction; evaluated via Sharpe ratio, max drawdown, and win rate, against the risk-free rate
- Verified logic with pytest unit tests; documented methodology and limitations in a public README.

Skills

Technical Skills & Tools: Python, PyTorch, pandas, SciKit-Learn, fastai, MATLAB, Git, GitHub, yfinance, pytest
Interests: Quantitative Finance, Machine Learning, Financial Engineering