Rajdeep (Raj) Singh

rlogger | raj-singh.com | rajdeeps@usc.edu | +1.858.252.9633

Education

Planned	Master's Degree (planned) at **Stanford University**	(GPA: 4.0/4.0)
2025 - present	Master's Degree at **University of Southern California**	(GPA: 4.0/4.0)
2022 - 2024	Bachelor's Degree at **University of California, Santa Cruz**	(GPA: 4.0/4.0)
2022	Canyon Crest Academy	(Grades)

Experience

Student Researcher Jan 2024 – Mar 2025
USC Center for Artificial Intelligence (CAIS) *Los Angeles, CA*

- Built anomaly detection pipeline for highway driving scenarios using Waymo Open Dataset, achieving 94% precision in identifying safety-critical events and unusual traffic patterns
- Implemented determinism testing suite for FSD neural networks, validating model reproducibility across KITTI and nuScenes datasets with 99.9% consistency in multi-run inference
- Optimized sensor fusion algorithms for LiDAR-camera perception, reducing inference latency by 40% while maintaining detection mAP above 0.85 for pedestrian and vehicle classes

Founding Engineer Intern July 2024 – Sept 2024, July 2025 – Sept 2025
Forge Rewards (YC W23) *Palo Alto, CA*

- Architected Python/PostgreSQL backend services, reducing API response times by 40% and serving 10K+ daily users
- Shipped 15+ production features across full stack, collaborating with founders on product
- Built automated testing and CI/CD pipelines, increasing deployment frequency by 3x (daily releases)

NSF Research Intern May 2023 – July 2023
Embry-Riddle Aeronautical University *Daytona Beach, FL*

- Researched AI safety for autonomous drone swarms, achieving 92% detection rate for anomalous behaviors (Advisor: Prof. Yongxin Liu)
- Developed novel swarm coordination approaches, improving accuracy by 25% over baseline methods
- Built simulation frameworks for route planning and anomaly detection with 10K+ test scenarios

Hardware Engineering Co-op Fall 2021 – Winter 2022
DRS Daylight Solutions *San Diego, CA*

- Led 6-person intern team building Cable Impedance Tester, managing sub-teams and integrating hardware/software (Supervisor: Dave Snodgrass)
- Optimized SDKs for Quantum Cascade Laser Controllers, improving performance by 35%
- Developed microcontroller interface library with 8b/10b encoding for 10 Mbps data transfer

Publications

Singh*, Rajdeep (2025a). "JAX-HDC: A High-Performance JAX Library for Hyperdimensional Computing and Vector Symbolic Architectures". In: *Journal of Machine Learning Research*. Pending 2025.

– (2025b). "Safety and Performance Assurance for Swarm UAV Operations: A Survey". In: *2025 SecureTrans Workshop at IEEE Symposiums on Security and Privacy*. Accepted as Poster. San Francisco, California, USA.

Projects

JAX-HDC | *JAX, Python* github.com/rlogger/jax-hdc

- High-performance JAX library for Hyperdimensional Computing and Vector Symbolic Architectures with 100x+ speedup over NumPy implementations

Pâro — eater | *SwiftUI, iOS* github.com/rlogger/paro

- iOS app removing decision paralysis when ordering takeout, featuring custom UI components and restaurant API integration

Algorithmic Trading on Small-Cap Securities 2020 – 2024

- Discovered alpha by identifying correlations in overnight gaps of small-cap securities

Comma.AI/Comma10k github.com/commaai/comma10k

- Contributed test/train validation for OpenPilot autonomous driving system, improving lane centering accuracy

Skills

Frameworks & Tools	JAX, TensorFlow, FastAPI, Kubernetes, Git
Platforms & Libraries	Nix, Neovim, GCP, CARLA
Languages	Python, Lean (familiar), C/C++

Awards

- USA Computing Olympiad Gold Rank (top 5%)
- FRC Robotics World Champion ('19)
- Dean's Honors (2022-)

Misc

- D.E Shaw Fellow (2023)
- Jane Street SEE (2023)