Kyle Berkson

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EDUCATION

California Institute of Technology   Pasadena, CA
Bachelor of Science in Applied Computational Math, Minor in CS   **Graduating June 2028**
Clubs/Activities: Division III NCAA Track and Field and Cross Country   **GPA: 4.2**
Relevant Coursework: Data Structures and Algorithms, Analytical Linear Algebra, Computational Methods, Software Design.

WORK EXPERIENCE

Caltech Summer Undergraduate Research Fellowship   Pasadena, CA
Undergraduate Researcher   **Jun 2025 - Present**
- Developed a novel Bayesian uncertainty algorithm for NeRF-based Event Horizon Telescope tomography in JAX/Flax, giving per-voxel confidence maps for black-hole reconstructions in both 2D and 3D scenarios.
- Delivered ensemble-level uncertainty calibration with 100x less GPU time, enabling quick analysis of low-confidence geometry in reconstructions. understand geometric uncertainty in their reconstructions.

Nexa   Pasadena, CA
Co-Founder   **November 2024 - Present**
- Secured $600k+ in pre-seed funding, got accepted into YCombinator (S25) to build a state of the art microchip and software platform for livestock monitoring, acquiring $400k in LOIs from target cattle operations.
- Led a 4-engineer software team: owned architecture and roadmap, ran weekly sprints, set coding/testing standards, and mentored others, shipping MVP in 3 weeks.
- Built real-time disease & estrus detection and classification pipelines blending signal processing with time-series ML, outperforming research baselines by 15% recall + 10% AUROC on internal validation and reduced false alerts by 26%.
- Designed an end-to-end evaluation and testing suite: synthetic data generators, backtests, ablations, shadow-mode trials, and CI with unit/integration/regression tests; added data-drift checks and load tests that simulate bursty device traffic.
- Architected an end-to-end platform—Django + Celery on PostgreSQL/Redis with versioned REST APIs powering a React/Tailwind UI—ingesting 100k+ readings/day and delivering herd/cow analytics with latency < 2 min.

Shiboleth   Pasadena, CA
Machine Learning Engineer   **February 2025 - Jun 2025**
- Cut classification spend by 82% and latency by 200% by leveraging NLP techniques to build an asynchronous FinTech-to-Bank taxonomy mapper that auto-labels thousands of complaints per second, raising flags for mislabels or ambiguous cases to increase accuracy by 10%.
- Developed a RAG library, improving precision@5 by 12% through cross-encoder reranking and configurable cleaning/filtering.
- Wrote a dual-output preprocessing layer that strips PII, generating LLM-ready JSON and normalized token streams for embeddings, enabling transparent audits and downstream analytics.

SKILLS

Programming Languages: Python, C, Java, JavaScript, HTML/CSS

Frameworks: Django, Celery, React, Tailwind

ML/Data: Machine Learning Algorithms, JAX/Flax, Pytorch, LLMs and RAG, Tensorflow, Uncertainty Quantification, Signal Processing.

Hardware: Microcontrollers, I2C communication, Control Theory

Infra/Tools: PostgreSQL, Git, Linux, Docker, AWS, REST APIs, Redis

Soft Skills: Technical writing, Research collaboratio