Theo Teske

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EDUCATION

University of Minnesota   January 2025 - December 2025
- Non-degree student, Computer Science Prerequisite Sequence.
- **GPA:** 4.0.
- **Relevant Coursework:** Theory of Computation, Machine Architecture, Algorithms and Data Structures, Operating Systems, Program Design and Development.

University of California, Los Angeles   September 2020 - June 2024
- B.S., Applied Mathematics and B.S., Economics.
- **Math GPA:** 3.53 (Overall: 3.34).
- **Honors:** William Lowell Putnam Mathematical Competition 2023 (Score: 25/120, Top 600 rank).
- **Relevant Coursework:** Probability Theory, Graph Theory, Combinatorics, Linear Algebra, Real Analysis.

RESEARCH PROJECTS

Unary Context-Free Languages are Regular   October 2025
- Expository paper written under the supervision of Carl Sturtivant.
- Developed a direct and elementary proof establishing that the string-lengths of a unary CFL form semi-linear sets, providing a constructive alternative to the full machinery of Parikh's Theorem.
- Utilized the Pumping Lemma to decompose string lengths into finite unions of arithmetic progressions and applied the Myhill-Nerode Theorem to establish regularity via the finiteness of equivalence classes.

Identifying Auction Fraud with Decision Tree-Based Methods   June 2023
- Capstone of applied machine learning research seminar taught by Randall Rojas.
- Investigated shill bidding detection in eBay auctions by implementing ensemble methods, addressing severe class imbalance through a comparative analysis of synthetic over-sampling (SMOTE) versus algorithmic class weighting.
- Achieved performance exceeding current literature ($F1 > 0.99$) with Weighted XGBoost, identifying "successive outbidding" as the primary fraud predictor through variable importance analysis.

PROFESSIONAL EXPERIENCE

Reality AI / Generative AI Engineer   April 2025 - September 2025
- Designed state-based control flows using LangGraph, modeling user interactions as deterministic transitions within a directed acyclic graph to ensure robustness in probabilistic generative systems.

- Optimized semantic information retrieval by implementing Approximate Nearest Neighbor (ANN) search algorithms within high-dimensional vector spaces using Redis and OpenAI embeddings.
- Deployed containerized microservices via Docker on Google Cloud Platform (GCP), utilizing Log Explorer to monitor system latency and throughput.

Outlier AI / Software Designer - AI Trainer   June 2024 - December 2024
- Executed supervised fine-tuning and reinforcement learning (RLHF) on LLMs, focusing on optimizing model performance on complex mathematical reasoning tasks.
- Enhanced model reasoning capabilities by formalizing logical deduction steps via Chain-of-Thought (CoT) prompting, effectively structuring the generation process into discrete, verifiable computational steps.
- Curated high-fidelity training distributions, applying statistical filtering techniques in Pandas and NumPy to minimize noise and bias in fine-tuning datasets.

UCLA Office of Advanced Research Computing / Young Tech Professional   March 2024 - June 2024
- Co-developed a geo-spatial fitness recommendation application using Python and Flask.
- Architected a multi-index retrieval system, optimizing query complexity for high-dimensional spatial and semantic data using PostgreSQL and pgvector.
- **Award:** "Most Commercially Viable Application" at Innovate@UCLA (Presented to industry leaders).

SKILLS

- **Languages:** Python, C/C++, JavaScript/TypeScript, SQL, LaTeX.
- **Frameworks & Libraries:** LangChain, LlamaIndex, FastAPI, Flask, NumPy, Pandas, PyTorch, LangGraph.
- **Tools & Platforms:** Docker, Google Cloud Platform (GCP), AWS, Git, Redis, PostgreSQL.