Yourui Shao

youruishao115022@gmail.com | github.com/iuruoy-shao

Education

California Institute of Technology, B.S. in Computer Science — Sep 2025 – Jun 2029

BASIS Independent Silicon Valley, 4.0 UW GPA — Aug 2021 – May 2025

- **Courses:** Linear Algebra, Differential Equations, AP Calculus BC, AP Statistics, AP Computer Science A, AP Computer Science Principles, Modern Physics, AP Physics C, Honors Biology, Honors Chemistry

Brain-Inspired Computing @ CA State Summer School for Math & Science (COSMOS) — Jul 2024 – Aug 2024

- Under UCLA Prof. Hugh Tad Blair, investigated mechanical parallels between human neurological pathways and mathematical foundations for AI neural networks.
- Reverse-engineered models (e.g. AlexNet) to solve traditional tasks (e.g. MNIST). Mastered use of PyTorch.

Projects & Experiences

Word Embeddings Research @ San Jose State University — Aug 2024 – Present

- Working with Prof. William Andreopoulos to develop low-cost methods for word embeddings using bit arrays as alternative to existing neural network-based generation.
- Iteratively improved algorithms via analyzing underlying mathematical and NLP techniques.

Reinforcement Learning for *Fish* (Senior Research Project) — Jan 2025 – May 2025

- Studying social dynamics in reinforcement learning via deception in the multiplayer card game *Fish*.
- Designed and optimized Q-learning and hand prediction neural networks. Programmed collection and state conversion of real-world and simulated gameplay data.

Pavyl, pavyl.com — Jan 2025 – Mar 2025

- Helped build low-cost AI assistant with infinite cross-conversational memory.
- Led UI/UX design, implementing front and backend utilities with React and Supabase in TypeScript.

AMC Problems Trainer, problemstrainer.app — Feb 2023 – Oct 2024

- Trained DistilBERT on web-scraped AMC (American Mathematics Competitions) problems for multi-label classification with 94% accuracy. Paper presented at IEEE BigDataService.
- Designed and built with Flask practice-based, adaptive learning system for competition math.

Acceptify AI, acceptifyai.com — Jul 2024 – Aug 2024

- At COSMOS, developed Random Forest model and interactive web app accurately predicting post-secondary education outcomes at 85-92% accuracy. Paper presented at IEEE FMLDS.
- Generated 21,000+ data points from unstructured Reddit post content via feature extraction with LLMs.

Publications

Predicting College Admission Results with Machine Learning on Unstructured Online Data, 2024 IEEE FMLDS — Nov 2024

An Accurate Classification and Recommendation Method of Competitive Math Problems, 2024 IEEE BigDataService — Jul 2024

Awards

Math Prize for Girls Qualification, x2 — 2023 & 2024

- Placed nationally within top 100 of pre-collegiate female-identifying math contestants.

American Invitational Mathematics Examination (AIME) Qualification, x4 — 2021 – 2025

Berkeley Math Tournament Distinguished Honor Roll x2, Honor Roll x3 — 2022 – 2025

Bay Area Math Olympiad (BAMO-12) 11th place — 2023