

YASHNIL MOHANTY

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Education

Stanford University

Sep. 2026 – Jun. 2030

B.S. in Computer Science (Intended)

Stanford, CA

Relevant Coursework: CS 106B: Programming Abstractions, MATH 51: Linear Algebra and Multivariable Calculus

Technical Skills

Languages: Python, JavaScript, Java, C++

ML Frameworks: PyTorch, TensorFlow/Keras, scikit-learn, XGBoost

Scientific Computing: NumPy, pandas, SciPy, AnnData, xarray

Experience

University of California, Santa Cruz

Feb. 2025 – Apr. 2026

Research Intern

Santa Cruz, CA

- Built a PyTorch FlowMap autoencoder with a 192-dimensional latent representation to emulate FastChem equilibrium chemistry across 4.8M simulations and 33 chemical species.
- Optimized training with AdamW and train-only normalization, cutting Log MAE by 71 percent to 0.0039 dex with Log $R^2 = 0.9999$.
- Achieved up to $1,500\times$ GPU and $250\times$ CPU inference throughput relative to FastChem; released the model as the open-source `chemcalculations` Python package.

National Center for Atmospheric Research

Sep. 2024 – Aug. 2025

Research Intern

Boulder, CO

- Designed a three-stage distribution-shift study using Random Forest, MLP, and LSTM models on 15 years of satellite and hydrometeorological data.
- Found that models trained only on unburned landscapes dropped from $R^2 = 0.86$ to 0.72–0.79 in heavily burned regions; adding burned training samples recovered performance more effectively than adding burn fraction as a feature.
- Analyzed model bias and feature importance across burn severity, elevation, and land cover; first-authored the resulting research paper.

Future Speakers Initiative

Feb. 2025 – May 2026

Founder and President

- Founded a nonprofit expanding public speaking and debate access for underserved students; built curriculum and led a volunteer teaching network reaching 500+ students.

Projects

Zero-Shot Virtual Cell Modeling | Python, PyTorch, AnnData

Sep. 2026 – Present

- Built a zero-shot CRISPRi response-prediction pipeline for unseen cellular contexts using leave-one-context-out evaluation and response decomposition.
- Quantified context-specific interaction effects at approximately 21 percent of response signal and developed a transfer-focused model centered on conserved perturbation effects.
- Engineered reproducible single-cell data and evaluation pipelines using sparse count matrices, integrity checks, and automated testing across 18,533 genes.

Physics-Guided Harmful Algal Bloom Forecasting | Python, PyTorch

Jun. 2025 – Sep. 2025

- Built and compared ConvLSTM, Temporal Fusion Transformer, and physics-informed ConvLSTM models using 18.6 years of satellite, ocean, and atmospheric data.
- Integrated a 2-D advection–diffusion constraint into training, improving validation RMSE by 8.3 percent and maintaining < 3% skill degradation during the 2019 marine heatwave.

Sidequest, an AI Travel Planning Engine | TypeScript, React, Next.js

Jul. 2026 – Present

- Built a full-stack travel planning engine combining AI-assisted discovery with deterministic scheduling across routing, opening hours, weather, daylight, transit, and access constraints.
- Engineered constraint validation, persistent trip state, and dependency-aware replanning so itinerary edits preserve unaffected plans while recomputing impacted activities.

Awards

Regeneron Science Talent Search Scholar (Top 300), 2026

USA Computing Olympiad (USACO) Gold Division, 2025

3× American Invitational Mathematics Examination (AIME) Qualifier, 2023 – 2025