

GOBIND PUNIANI

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EDUCATION

DOMINICAN UNIVERSITY OF CALIFORNIA

Graduated May 2022

B.S. in Applied Computer Science, Data Science Concentration

- *Relevant Curriculum:* Data Structures & Algorithms, Machine Learning, Deep Learning, NLP, Core Applications of AI, Product Development
- *Activities & Societies:* Data Science Club (VP), Mathematics Club (President), Future Entrepreneurs Student Group, Peer Mentorship
- *Teaching:* Senior Teaching Assistant for the Data Science Concentration

CALIFORNIA STATE UNIVERSITY, FRESNO

Graduated May 2020

B.S. in Applied Mathematics, Mn. Physics — **Magna Cum Laude**

President's Honors Scholarship, Smittcamp Family Honors College

- *Relevant Curriculum:* Calculus I-III, Linear Algebra, Statistics, Partial Differential Equations, Mathematical Modeling, Numerical Analysis
- *Activities & Societies:* Laval Entrepreneurship Mentor Program, Society of Industrial & Applied Mathematics Club, Peer Mentor, Phi Kappa Phi
- *Teaching:* Instructional Student Assistant for the Department of Mathematics

EXPERIENCE

SYMBOLICA AI

Apr. 2023 – Feb. 2024

Founding Machine Learning Research Scientist

- Led the company research direction by designing and running robust experiments in pursuit of a novel application of hypergraph rewriting for foundation-level machine learning, including implementing highly optimized, production-grade ML algorithms (traditional and novel) in **Rust** for rigorous benchmark comparisons.
- Devised a production-ready solution using group theory and specialized math software libraries (such as **GAP** and **nauty**) for a variant of the subgraph isomorphism problem (generally NP-hard).
- Improved the compute efficiency for training VAEs by ~30% using pre-trained latent features. Designed and tested diffusion-based computer vision models from **Hugging Face** on adversarial robustness with noised CIFAR-10 and ImageNet datasets (preprocessed via **NumPy**). Conducted other large-scale experiments on GPU clusters using **ClearML** with diffusion-based and Transformer-based language models implemented using **PyTorch**.
- Conducted frequent literature review, drawing insights from SOTA results in addition to underexplored avenues. Wrote a provisional patent for our hypergraph rewriting-based language model. Created pitch demo visualization using **Gradio** with ChatGPT API integration.

SCALETRADE

June 2022 – Feb. 2023

Machine Learning Researcher

- Researched, trained, and fine-tuned machine learning algorithms for profitable day trading based on technical analysis using standard **Python** data science libraries such as **NumPy**, **Pandas**, **scikit-learn**, and **Matplotlib** in addition to specialized finance libraries like **TA-Lib**.
- Developed and deployed (through **Alpaca**) models that achieved >98% accuracy in predicting profitable trades in paper trading and backtesting.

OMNITRACS

June 2021 – Aug. 2021

Data Science Intern | Data Science & AI Team

- Generated insights for improving efficiency of commercial long-haul truck movement through 15 major seaports by analyzing proprietary data and developing visualizations using **SQL**, **Snowflake**, **Looker**, and **Confluence**.
- Initiated new planning procedures for cargo truck pick-ups at seaports after presenting a comprehensive project report to the Data Science team, including the Director of AI and the Chief Data & AI Officer of Omnitrac.

PROJECTS

EXPLORING THE ROLE OF ACTIVATION FUNCTIONS IN DEEP LEARNING

Aug. 2019 – Aug. 2020

Lead Student Researcher

- Investigated the role of activation functions in the performance of artificial neural networks in image classification, graph neural networks, and natural language processing in relation to numerous model architectures and hyper-parameters.
- Conducted literature review and carried out benchmark comparisons with bespoke activation functions against frequently-used ones in **PyTorch** on a GPU server. Created loss and accuracy plots with **Chartify**.
- Awarded 3rd place in the Undergraduate Oral Presentation division at the 2020 College of Science & Mathematics Virtual Research Showcase.