Armeet Singh Jatyani

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Education

California Institute of Technology (Caltech) Expected June 2026

B.S. in Computer Science, Applied and Computational Mathematics *GPA: 4.0/4.0*

Coursework: Large Language and Vision Models, Machine Learning and Data Mining, Probability and Inferential Statistics, Computer Vision, Algorithms, Theory of Computation, Data Structures, Functional Programming, Operating Systems, Object Oriented Software Design

Experience

Research Fellow November 2023 - Current

Professor Anima Anandkumar, Dr. Jiayun Wang *Anima AI + Science Lab, Caltech*

Accelerated MRI/CT/PACT Reconstruction

- Developed novel neural operator architecture for zero-shot mask invariant accelerated MRI.
- Implemented Graph Neural Operator (GNO) and Fourier Neural Operator (FNO) from scratch
- Beat state of the art (E2E-Varnet) on reconstruction metrics and generalization experiments.

Lung Ultrasound Reconstruction

- Implemented 2D/3D U-Nets to reconstruct lung images from ultrasound data.
- Improved inference depth from 32 mm to 96 mm.

Research Fellow June 2023 - October 2023

Professor Robert W. Clayton, Dr. Ettore Biondi *Seismo Lab, Caltech*

- Implemented virtual source method to image Long Beach fault lines.
- Engineered data processing pipeline to analyze 170 TB of seismic data from 5000 sensors.
- Leveraged PyCUDA and parallelization to cut compute time from 27 hours to 2.5 hours.

Research Intern July 2022 - September 2022

Professor Lu Wei *Wei Bio-Imaging Lab, Caltech*

- Prepared food samples, captured Raman spectra, compiled training dataset focused on 10 analytes.
- Trained CNNs to detect molecules from Raman spectra with 80% accuracy.

Projects

Paper Implementations

- Recreated ViT, GPT, Transformer, DDPM, SDE score-based diffusion, and ResNet papers in PyTorch.
- Recreated 40+ pages of rigorous paper derivations.

Automatic Differentiation Engine & Neural Network Library github.com/armeetj/autograd

- Developed scalar auto-differentiation engine and tiny neural MLP neural network library.
- Wrote 3 demos training neural networks built with my library on common datasets.

Returning Customer Prediction Competition

- Trained gradient boosting models using `catboost` to identify customer phone plan renewal.
- Ensembled 7 models and placed 6th out of 50 teams in Kaggle competition.

Publications & Awards

[1] **Armeet S. Jatyani***, Jiayun Wang*, Anima Anandkumar. "NeuralOp-VarNet: Zero-Shot, Multi-Resolution Solvers for Accelerated MRI Reconstruction." *Manuscript in preparation for submission to peer-reviewed journal.*

[2] **Armeet S. Jatyani**. "Fourier Neural Operators and Global Spectral Convolutions" *Notes in preparation.*

[3] **Armeet S. Jatyani**. "Imaging Hidden Faults in Long Beach." [preprint].

[4] **Armeet S. Jatyani**. "Bias in Industry Leading Facial Recognition Services." *IJIRMF*, vol. 7, 2021.

[5] NVIDIA DLI Certification

Skills

Machine Learning: NVIDIA PyTorch, Lightning, TensorFlow, PyCUDA, W&B, NumPy, Pandas, Scipy, Langchain
Languages: Python, C, C++, Java, JavaScript, OCaml, x86 Assembly
Other: Git, React, Next.js, Express, Axum (rust), OpenAI, AWS, GCP, Heroku, Vercel