Dikshant Sagar

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Summary

Machine Learning Engineer and Researcher with 5+ years of experience building, optimizing, and deploying advanced deep learning models, now pursuing a PhD at UC Irvine (Advisor: Pierre Baldi). Demonstrated expertise in healthcare, drug discovery, physics and scientific AI applications with **9+** peer-reviewed publications. Skilled in designing scalable ML pipelines, fine-tuning LLMs and vision–language models, and accelerating training on distributed GPU clusters. Strong track record of translating research into real-world applications and collaborating across disciplines to integrate AI into impactful solutions.

Skills

Programming: Python, Javascript, C/C++, Java, SQL
ML/DL: PyTorch, TensorFlow, WandB, PyTorch Lightning, Hugging Face, Scikit-Learn, Keras, OpenCV
Distributed/Systems: CUDA, DeepSpeed, Accelerate, Docker, MPI, Slurm, HPC
Cloud: AWS (EC2, S3, and Lambda), GCP (Vertex AI, BigQuery, and Kubernetes Engine)
Other: Git, Linux, Bash/Zsh, LaTeX, Tableau, NumPy, Pandas

Education

University of California, Irvine 2024–Present
Ph.D. in Computer Science (GPA: 4.0) | Advisor: Dr. Pierre Baldi
Research Areas: Machine Learning, Deep Learning, AI for Healthcare, Biomedicine, and Physics.

California State University, Los Angeles 2022–2024
M.S. in Computer Science (GPA: 4.0) | Advisor: Dr. Navid Amini
Thesis: Deep Reconstruction Model for Exposing Low-Concentration Metabolites in Edited-MRS Brain Scans.

Indraprastha Institute of Information Technology, Delhi 2017–2021
B.Tech in Computer Science (Upper GPA: 3.2) | Advisor: Dr. Anubha Gupta
Thesis: Multiple Myeloma Cancer Cell Instance Segmentation.

Research Experience

Graduate Research Assistant, Baldi Lab, UC Irvine 2024–Present

- Fine-tuned **LLaMA 3.2-11B Vision-Instruct** LLM with QLoRA for neutrino event classification and explanation; improved baseline accuracy by *28%*.
- Developed **Sparsity invariant frame interpolation** for tilt series generation in Scanning/Transmission electron microscopy; improved PSNR by *6.6%* and SSIM by *3.3%* over the baseline.
- Implemented **Scalable Deep Learning based Signal Processing of LArTPC** for efficient neutrino track segmentation inference on CPU; improved memory usage by *84%* and time usage by *87%* while maintaining accuracy.
- Optimized and Improved **RNA-Seq differential analysis pipeline** using HISAT, Cufflinks and CyberT, achieving *10×* performance boost.
- Created a **Deep learning model for multi-slice melanocyte segmentation and PRAME index prediction**, reducing PRAME IHC orders by *30%*, cutting TAT by *3.5 min/case*, and saving around *$28K/1K* cases annually at fixed sensitivity.

Graduate Research Assistant, Computational Molecular Biology Lab, CSULA 2023–2024

- Built **Physics-guided deep generative models** for conditional de novo structure based drug discovery; *CSBW (ACM-BCB) 2023 Best Paper Finalist*; Improving average binding affinities by *13.4%* from previous state of the art method.

Graduate Research Assistant, Machine Learning and Sensing Lab, CSULA 2023–2024

- Proposed dual-encoder self-attention model for **GABA Edited-MRS reconstruction**; achieved *95%* lower MSE and *450%* higher SNR vs. baseline (simulated raw MRS data).

Research Associate, SBI Lab, IIIT Delhi 2021–2022

- Created multi-head self attention based **Representation learning for unsupervised clustering of flow cytometry data**; Improving by 14% on average on six benchmark datasets over the previous state of the art.
- Developed **Hybrid GCN (GCRS)** for multiple myeloma risk stratification; published in *Computers in Biology and Medicine* (IF 7.7).

Undergraduate Researcher, MIDAS Lab, IIIT Delhi 2020–2020

- Built **Deep Learning-based attribute-wise user preference matching** and learning using Bayesian Personalized Ranking obtained an AUC of 0.8502, increasing it by *2%* more than the best previous work.

Publications (Published / Accepted)

- Robles E., **Sagar D.**, et al. *Heterogeneous Point Set Transformers for Segmentation of Multiple View Particle Detectors* Accepted to NeurIPS 2025 Workshop - Machine Learning for the Physical Sciences.
- **Sagar D.**, et al. *Angular Sparsity Invariant Tilt Series Generation in Scanning/Transmission Electron Microscopy* Accepted to NeurIPS 2025 Workshop - Machine Learning for the Physical Sciences.
- **Sagar D.**, et al. *Scalable Inference for LArTPC Signal Processing with MobileU-Net and Overlap–Tile Chunking* Accepted to NeurIPS 2025 Workshop - Machine Learning for the Physical Sciences.
- Gupta A., Hooda R., Motwani S., **Sagar D.**, et al. *MuSARCyto: Multi-Head Self-Attention for Cytometry Data Clustering.* Cytometry A, 2025.
- **Sagar D.**, Jasko A., Forouzesh N. *Enhancing Drug Discovery via Physics-Guided Deep Generative Models.* Comp. Struct. Bioinformatics Workshop, 2024.
- Chatterjee R., **Sagar D.**, et al. *Deep Residual Distilled CNNs for Stroke Detection.* International Journal of Semantic Computing, 2024.
- **Sagar D.**, Risheh A., Sheikh N., Forouzesh N. *Physics-Guided Deep Generative Model for Ligand Discovery.* ACM-BCB, 2023. **Best Paper Finalist**.
- **Sagar D.**, Aggarwal P., Farswan A., Gupta R., Gupta A. *GCRS: Hybrid Graph Convolutional Network for Risk Stratification in Multiple Myeloma.* Computers in Biology and Medicine, 2022.
- See full list on Google Scholar: https://scholar.google.com/citations?user=6FOyM3IAAAAJ&hl=en

Publications (Under Review)

- **Sagar D.**, et al. *Adapting Vision-Language Models for Neutrino Event Analysis in High-Energy Physics* Under review in Nature Communications, August 2025.

Awards & Honors

- UCI Computer Science Department Research Fellowship (2024).
- Outstanding Graduate Student Award, CSULA (2024).
- Outstanding Oral Presentation, RSCA (2024).
- Best Paper Finalist, ACM-BCB (2023).
- CSUBIOTECH Graduate Scholarships & Travel Grants (2022–2024).

Teaching

- Teaching Assistant, COMPSCI 171 – Introduction to Artificial Intelligence, UC Irvine (Winter 2025, Spring 2025).
- Teaching Assistant, CS4550 – Computer Graphics, CSULA (Fall 2023).
- Teaching Assistant, CS4540 – Data Visualization, CSULA (Fall 2022).
- Instructor, Intro to Deep Learning (Lab short course), CSULA (Summers 2023, 2024).

Academic Service

Reviewer

- Neural Networks Journal (2024).
- NeurIPS ML4PS Workshop (2025).