N A Adarsh Pritam

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Portfolio: adarsh-crafts.github.io Scholar: Google Scholar

OVERVIEW

I am currently a Master's student (2024–26) at Alliance University, working on generative and multimodal machine learning for NeuroAI & Healthcare. My research focuses on representation learning, particularly brain-to-latent alignment in generative models (Brain2VLM), and, synthetic data generation for biomedical imaging, under the supervision of Dr. Jeba Shiney and Sanyam Jain. Some of my other work and projects also determine my interest in Deep Learning for Computer Vision, NLP and Explainable AI. In my Master's, I studied Classical ML, Computer Vision, Natural Language Processing, and Deep Learning taught by Dr. Jeba Shiney, Dr. Vijayalakshmi Nanjappan, and Dr. Raj Dash. Conversely, I was a research intern in the i2cs lab at the Indian Institute of Information Technology (IIIT) Kottayam, where my focus was to provide deep learning edge to the team for Plant Disease Detection and Diagnosis. I belong to the south part of India, from a city called Bangalore which lies in Karnataka.

EDUCATION

2024 – 2026
Master of Science, Data Science
Deep Learning, ML for Image Processing, Natural Language Processing, Machine Learning, MLOps, Data Science, Research Methodology.
Alliance University
Bangalore, India
8.9/10 SGPA (Sem 3)
(Currently in sem 4)

2021 – 2024
Bachelor of Science, Mathematics and Statistics
Mathematical Statistics, Probability, Applied Mathematics.
Bengaluru City University
Bangalore, India
(CGPA: 6.5/10)

RELEVANT EXPERIENCE

08.2025 – Present
Graduate Research Student
(1) Developed **Brain2VLM**, decoding fMRI activity into diffusion latents and CLIP embeddings, revealing distinct linear and nonlinear alignment regimes ($\Delta \approx 0.47$) and improving reconstruction performance (CLIP $\approx 85\%$).
(2) Developed **SkinGenBench**, a generative benchmark on dermoscopic data (14K+ images), showing GAN-based models outperform diffusion, achieving ROC-AUC 0.98 and 8–15% gains.
Alliance University, Bangalore
Supervisor: Dr. Jeba Shiney

05.2025 – 09.2025
Summer ML Research Intern
Developed multimodal plant disease detection system using CLIP (ViT-L) + InternLM2. Designed projection module for aligning vision and language representations. Implemented scalable training pipelines and contributed to research manuscript.
Indian Institute of Information Technology (IIIT) Kottayam
Supervisor: Dr. Kala S (Head @ i2CS Research Group)

Glimpse of MSc. Thesis

Title: Learning Structured Representations: From Brain-to-Latent Alignment to Generative Modeling in Biomedical Imaging
Supervisor: Prof Jeba Shiney
Abstract: Investigates hierarchical brain-to-latent alignment and generative modeling in two complementary works.

(1) **Brain2VLM** studies hierarchical brain-to-latent alignment by decoding fMRI activity into diffusion latents and CLIP embedding spaces using linear (ridge) and nonlinear (residual MLP) decoders. On the Natural Scenes Dataset, results show that linear mappings suffice for structural latents ($\Delta \approx 0.05$–0.06), while nonlinear decoding substantially improves semantic alignment ($\Delta \approx 0.47$, MMD 0.042 vs 0.358), leading to stronger reconstruction performance (PixCorr ≈ 0.33, CLIP $\approx 85\%$) and exposing a trade-off between alignment accuracy and generative compatibility. Preprint: https://doi.org/10.13140/RG.2.2.26951.05288, Code: https://github.com/adarsh-crafts/Brain2VLM

(2) **SkinGenBench** introduces a systematic biomedical imaging benchmark analyzing the interplay between preprocessing complexity and generative model choice for synthetic dermoscopic augmentation. Across 14,116 images from HAM10000 and MILK10K, we show that generative architecture dominates preprocessing, with StyleGAN2-ADA achieving superior fidelity (FID ≈ 65.5, KID ≈ 0.05) and delivering 8–15% gains in melanoma F1-score (ViT-B/16 F1 ≈ 0.88, ROC-AUC ≈ 0.98). Preprint: https://arxiv.org/abs/2512.17585, Code: https://github.com/adarsh-crafts/SkinGenBench

ONGOING RESEARCH PAPERS AND PROJECTS

- **List of Publications:** https://scholar.google.com/citations?user=Sm8_hWgAAAAJ&hl=en
- **(preprint)** Brain2VLM: Hierarchical Alignment Between Cortical Representations and Vision-Language Latent Spaces. Available at: https://doi.org/10.13140/RG.2.2.26951.05288
- **(preprint)** SkinGenBench: Generative Model and Preprocessing Effects for Synthetic Dermoscopic Augmentation in Melanoma Diagnosis. Available at: https://arxiv.org/abs/2512.17585
- **IEEE - ETCC 2025:** American-Sign-Language to Fluent-English Detection and Translation Using T5. Available at: https://ieeexplore.ieee.org/document/11108641/
- **Project LLaMA LLM Reimplementation:** Built an LLM from scratch to mimic communication style using personal chat logs. Implemented tokenizer, transformer, and QLoRA-based fine-tuning. Available at: https://github.com/adarsh-crafts/llama-llm-from-scratch and Medium Blog
- **(Open-Source Contribution) PyTorch Classification Extended:** Extended the bearpaw PyTorch image classification framework with Grad-CAM visualization and expanded support to more architectures. Available at: https://github.com/adarsh-crafts/pytorch-classification-extended
- **Project Life Expectancy Modeling:** Built an end-to-end ML pipeline on WHO data to model global life expectancy, incorporating preprocessing, multicollinearity analysis, and interpretable regression (Linear Regression, Decision Trees) with standard evaluation. deployed via Streamlit for interactive analysis. https://github.com/adarsh-crafts/life-expectancy-modeling

SKILLS

Core: Deep Learning, Multimodal Learning, Generative Models, Representation Learning
Frameworks: PyTorch, Transformers, OpenCV, Scikit-learn
Generative AI: Diffusion Models (Stable Diffusion), GANs, CLIP
Engineering: Docker, MLFlow, AWS, Git
Data: NumPy, pandas, SQL
Languages: English, Telugu, Hindi
Hobbies: Guitar, Trekking

CERTIFICATIONS & COURSES

- AWS Certified AI Practitioner, AIF-C01 (2024)

- Ethics in Data Science – University of Michigan (Coursera) (2026)
- The Data Scientist's Toolbox – John Hopkins University (Coursera) (2025)
- NVIDIA Fundamentals of Deep Learning (2025)
- Mathematics for Machine Learning and Data Science – DeepLearning.AI (2024)
- Google Data Business Intelligence Specialization (2023)
- Google Data Analytics Professional Certificate (2023)

AWARDS & ACHIEVEMENTS

- Invited to deliver seminars on machine learning research methodology for MSc Data Science students.
- Project Lead, Academic Review Papers and projects for courseworks
- Won multiple Battle of the bands (Musical Competitions) in and outside the university.
- High Achiever's Award, Distinction in Grade 4 Rock Guitar Examinations (London College of Music)

REFERENCES

1. Dr. Jeba Shiney (jeba.shiney@alliance.edu.in), Professor,
   Alliance School of Advanced Computing, Alliance University.
2. Dr. Vijayalakshmi Nanjappan (vijayalakshmi.n@alliance.edu.in), Associate Professor,
   Alliance School of Advanced Computing, Alliance University.
3. Dr. Kala S (kala@iiitkottayam.ac.in), Head of i2CS Research Group at Indian Institute of Information Technology (IIIT) Kottayam.