

Divya Rajparia

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Objective

To secure a job that will allow me to gain real-world experience while leveraging the strong academic skills I have acquired through my undergraduate program.

Education Details

Indian Institute of Technology, Hyderabad

Oct 2022 - Present

BTech in Engineering Science with Specialization in Computer Science

- **GPA: 9.33/10**
- **Ranked 2nd in my department**

PACE Junior Science College, Mumbai

May 2020 - Aug 2022

High School Diploma in Math, Science, and Computer Science

- JEE Mains 2022: scored **99.90 percentile** among over **1 million** students
- Secured **91.50%** in High School (12th Grade)

Lokhandwala Foundation School, Mumbai

June 2009 - May 2020

High School Diploma in Math, Science, and Computer Science

- Completed 10th standard with **98.17%**
- Silver Medalist, Dr. Homi Bhabha Young Scientist Competition. Amongst top **0.45%** of the participants
- Senior Diploma Holder in Music (Keyboard)

Experience

Enhancing tumor segmentation using Synthetic Data

Los Angeles, USA

University of Southern California

June 2025 - Present

Currently working as a research intern at the Laboratory for Machine Learning, Health, and Biomedicine, where we're focused on improving and automating the challenging task of **tumor segmentation** in breast and lung cancer. Annotating images manually takes up a lot of time of clinicians, and automating this would greatly improve productivity. Existing models often struggle when applied across different datasets due to their domain-specific nature. Our goal is to address this by **generating synthetic data** to handle domain shifts and develop a more **robust** and generalizable segmentation model.

DES: A Smarter Way to Grow Machine Learning Models Over Time

Hyderabad, India

Machine Learning and Vision Lab, IIT Hyderabad

Jan 2025 - May 2025

Continual Learning is a Machine Learning paradigm where the goal is to train models on tasks that arrive over time - like how humans learn - without forgetting past knowledge. Most existing methods rely on unrealistic assumptions (balanced data, access to old samples), which limit their use in real-world settings with privacy concerns or skewed data. We addressed this gap with a more practical approach.

- Proposed a new learning setup called AFCIL (**A**ssumption-**F**ree **C**lass-**I**ncremental **L**earning) that removes these assumptions - no need for stored data, works with imbalanced data, and supports pre-trained models like CLIP.
- Designed and implemented a novel method, **Dynamic Expert Saturation** (DES), which splits learning into two simple stages. The first stage focuses on learning the common (head) classes, and the second stage incrementally (dynamically) saturates the model to the rare (tail) classes. This avoids catastrophic forgetting and handles class imbalance naturally.
- Used **PyTorch** and **CLIP** backbone with lightweight adapters (MLPs), allowing efficient training without changing the base model. Final predictions were made by combining (weighting) the expert outputs.
- Achieved state-of-the-art results on CIFAR100-LT and ImageNet-LT, outperforming all existing methods including DualPrompt, CODA, and MoE-Adapter by up to 6% in accuracy.

Making Vision Transformers More Human Like: Learning from Parts

Hyderabad, India

Lab for Vision and Image Analysis, IIT Hyderabad (Submitted to Neurips 2025)

June 2024 – May 2025

Vision Transformers (ViTs) are a cutting-edge approach to image recognition that adapt transformer models (from language processing) to visual data. We investigated how Vision Transformers (ViTs) **understand complex images** by studying how they combine visual parts to form complete representations. This was driven by the need to make **ViTs more interpretable** and explainable, especially as they're increasingly used across computer vision tasks.

- Designed a framework using wavelet transforms to break images into meaningful pieces (frequency sub-bands) and tested whether ViTs could linearly combine and reconstruct the original from these parts.
- Built and trained models in PyTorch, ran large-scale experiments on ImageNet, and analyzed how well ViTs retain compositional information.
- We demonstrated that ViTs, which are highly non-linear, do **exhibit compositional behavior** at deeper layers. Simple linear combinations of wavelet primitives can closely approximate the original representations.
- We also tested our model under **real-world distortions**, such as additive noise and image compression, and found out that our framework persists even under such conditions.

Skills and Courses

- Fundamental Sciences: Life Sciences, Cognitive Science, Psychopathology, Biological Engineering
- Programming in Python, C/C++, MATLAB, HTML/CSS, JavaScript
- ML frameworks: Scikit-Learn, TensorFlow, and PyTorch
- Advanced Mathematics: Calculus, Linear Algebra, Statistics, Probability
- Computer Science: Computer Networks, Computer Architecture, Operating Systems, Compilers

Societies and Associations

Ideation Head, Entrepreneurship Cell IIT Hyderabad

May 2023 - Sept 2024

As the Head of Ideation at E-Cell, I was involved in hosting various entrepreneurial events. We brainstormed the execution plan of the E-Summit, convinced eminent speakers to attend our events, and hosted networking sessions for aspiring entrepreneurs. As the head, I was also tasked with **interviewing** new team members.

Head, Vibes – the music club of IIT Hyderabad

May 2023 - May 2024

As the head of the Music Club, I had the responsibility of managing the club and promoting a culture of Music on our campus. I oversaw all aspects of the club like **finances, events, and media relations**. I also **interviewed candidates** for induction to the club. This experience enhanced my **communication skills** and **ability to work with teams**.

Team Member, IIT Hyderabad Athletics Team

Personal Details

- Country of Citizenship – United States of America (USA)