

Anand Patel

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Research Focus

I work on reliable and scalable learning in Vision–Language Models (VLMs), with a focus on continual learning and geometric deep learning. My current research investigates how large multimodal models can continually acquire new tasks without catastrophic forgetting or architectural growth.

Research Areas: Continual Learning, Vision–Language Models, Computer Vision, Natural Language Processing.

Education

Indian Institute of Technology Bombay July 2024 – June 2027
MS by Research in Computer Science & Engineering

Thakur College of Engineering & Technology July 2020 – June 2024
BE in Computer Engineering CGPA: 8.94

Publications and Journals

SCoT: Similarity-guided Conflict-aware Task-vector Consolidation for Continual VQA

Accepted at ECCV 2026 | Aug 2025 - March 2026

- Proposed **SCoT**, a similarity-guided and conflict-aware continual learning framework that consolidates task vectors layer-wise in parameter space to balance stability and plasticity for continual VQA.
- Achieved near-zero catastrophic forgetting and strong positive backward transfer on VQAv2 and NExT-QA, outperforming continual learning and task-vector/model-merging baselines without architectural expansion.

Course Projects

Unified Multi-Task Framework for Image Denoising and Deblurring July 2025 - Nov 2025

- Designed a task-conditional multi-task image restoration framework using frozen DINOv3 ViT with LoRA adapters to jointly perform denoising and deblurring, improving robustness and generalization across diverse image domains.
- Reduced negative transfer from task-specific models and enhanced reliability by leveraging multi-task learning as an implicit regularizer for stable image restoration.

Generating High-Resolution Zoom-In for Images Jan 2025 - May 2025

- Developed a deep learning-based pipeline to generate high-quality super-resolved zoom-in regions from low-resolution inputs in real time.
- Built an interactive Streamlit-based interface for controlled zoom generation, improving usability and practical deployment of image enhancement systems.

Suspicious Person Identification & Tracking Aug 2024 - Dec 2024

- Contributed to a surveillance system under the Maharashtra Drone Mission, focusing on real-time suspicious person detection and tracking in aerial video streams.
- Implemented a deep learning-based Human Action Recognition (HAR) model to classify behavioral patterns for threat assessment.

Hybrid Movie Recommendation System Aug 2024 – Nov 2024

- Implemented a hybrid recommender system combining content-based similarity (cosine similarity) and collaborative filtering (SVD) to model user–item interactions and generate personalized recommendations.
- Conducted preprocessing and exploratory data analysis to improve recommendation relevance and scalability based on user interaction patterns.

Training and Workshops

Python 3.4.3 Training

April 2021 - May 2021

Spoken Tutorial - IIT-Bombay

Essential Mathematics for Machine Learning

July 2021 - Oct 2021

NPTEL - IIT-Roorkee

Machine Learning Training

Dec 2021 - Feb 2022

Internshala

Academic Service & Community

- **Student Volunteer:** IJCNLP-AACL 2025 (IIT-Bombay)
- **Teaching Assistant or Supervisions**
 - Data Analysis and Interpretation
 - Computer Programming and Utilization
 - Data Structures and Algorithms
 - Software Lab

Technical Skills and Interests

Languages: C, C++, Python, HTML & CSS, Bash Scripting

Tools: VS Code, Jupyter Notebook, Git, LaTeX, Heroku

Framework/Libraries: TensorFlow, PyTorch, Streamlit, Flask, Numpy, Pandas, Matplotlib

Areas of Interest: Programming & DSA, Mathematics, Machine Learning, Deep Learning, VLMs

Hobbies: Exercise & Meditation, Cycling, Basketball, Audiobooks

Selected Coursework

- CS 725: Foundations of Machine Learning
- IE 643: Deep Learning - Theory & Practice
- CS 726: Advanced Machine Learning
- GNR 650: Advanced Deep Learning for Image Analysis
- IE 624: Generative and Agentic AI
- CS 601: Algorithm and Complexity

Awards and Achievements

- Elite + Silver Medal in Essential Mathematics for Machine Learning (NPTEL Course) **Nov 2021**
- Hostel Food Waste Optimization idea selected among Top 10 Great Ideas for Campus Sustainability **May 2025**