

Abhinav Mahajan

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EDUCATION

Carnegie Mellon University

Master of Science in Computer Vision | GPA: 4.33/4.0

Pittsburgh, PA

December 2026

International Institute of Information Technology (IIIT Bangalore)

(Dual Degree) Master and Bachelor of Technology in Electronics and Communication Engineering

GPA: 3.63/4.00; Dean's Merit List; TA for Machine Learning (AI 511), Visual Recognition (AI 825)

Bangalore, India

July 2025

SKILLS

Programming Languages/Tools: Python, C++, Java, C, Javascript, MATLAB, SQL, AWS, Docker, PySpark

Libraries: PyTorch, NumPy, Pandas, Diffusers, OpenCV, Transformers, OpenGL, Simulation: Drake and Genesis

ML/CV Topics: Diffusion Models, LLMs, VLMs, Scene Understanding, Neural Radiance Fields, Gaussian Splatting

PROFESSIONAL EXPERIENCE

Amazon

Applied Scientist Intern [Advisors: Arindam Sarkar, Dr. Prakash Mandayam Comar]

Bangalore, India
January 2025 - June 2025

- Achieved **3.2x top-K recall gain** in next-purchase prediction with **novel exposure mitigation strategy for LLMs**.
- Refined adaptive compression for **10x token reduction** in user-history representation, with no performance loss.
- Distilled propensity-aligned LLM embeddings into a scoring model for customer-category (bi-directional) ranking.
- Deployed for personalized ad targeting with **+0.26% avg. lift** across 3 merchandising campaigns in **A/B tests**.
- Paper under review at KDD 2026; **Received full-time offer** for Applied Scientist-1 in the IML team, Bangalore.

Adobe Research

Research Intern [Advisors: Dr. KJ Joseph, Dr. Balaji Vasanth Srinivasan]

Bangalore, India
May 2024 - July 2024

- Developed pipeline using **VLMs and Diffusion models** to convert disjoint design assets into harmonized designs.
- Designed training-free composition method with CA/SA matrix manipulation improving **identity retention by 44%**.
- Introduced grounding based 2-stage LMM finetuning for typography prediction, with **0.69 MSE improvement**.
- Generated harmonized designs scored 20% higher on GPT-4V with **71% pairwise preference** over best baseline.
- US Patent no. **19/395,524**; Under review at **CVPR(CVEU) 26'**; **Received full-time offer** for MLE-1 in Firefly team.

Adobe Research

Research Intern [Advisors: Dr. KJ Joseph, Dr. Balaji Vasanth Srinivasan]

Bangalore, India
May 2023 - August 2023

- Trained **self-supervised Siamese network** to score graphic design aesthetics, removing human-annotation bias.
- Outperformed **GPT-4o** (68.84%), **LLaVA-NeXT** (34.17%) in design ranking, **achieving 94.97% rank accuracy**.
- Developed a **novel Genetic Algorithm** for layout refinement, achieving SoTA T-mIOU (**+4.38** over best baseline).
- System deployed in **Adobe Express**; Paper presented at **WACV 2025** (Round 1). **Received return-intern offer**.

PUBLICATIONS

- Jakobsson*, **Abhinav Mahajan*** et al. *Wiggle and Go! Deformable Object Rapid Motor Adaptation* **Under Review**
- Abhinav Mahajan*** et al. *MERIT: Mitigating Exposure Bias in Generative XMC for User Propensity*, **Under Review**
- Abhinav Mahajan*** et al. *Towards Design Generation from its Components*, **USPTO-19/395,524, Under Review**
- Goyal*, **Abhinav Mahajan*** et al. *Design-o-meter: Towards Evaluating and Refining Graphic Designs*, **WACV 2025**
- Ali Abedi*, Tracey Colella*, **Abhinav Mahajan** et al. *AVA: AI-driven Virtual Rehabilitation Assistant*, **WCISVR 2023**

RESEARCH EXPERIENCE

Research Intern - Human Sensing Lab, CMU [Advisor: Prof. Fernando De La Torre]

January 2026 – Present

- Developing **compression algorithms of 4D Gaussian Splatting** reconstructions for bandwidth-aware streaming.

Research Intern - Momentum Lab, CMU [Advisor: Prof. Jeff Ichnowski]

October 2025 – January 2026

- Built **sim2real** rope system identification model enabling zero-shot manipulation across multiple tasks on **xArm7**;
Achieved **3.55 cm accuracy** on 3D target striking (**4x better** than baseline); Paper under review at **RSS 2026**.

MITACS Fellowship - Ontario Tech University [Advisor: Prof. Pooria Madani]

August 2024 – October 2024

- One of ~100 fellows selected from **17,000+ applicants**; Analyzed user activity via **hierarchical screenshot parsing** with **VLMs** on a self-curated dataset and explored **active learning** for personalized UI models.

SELECTED PROJECTS

Flow Matching for 3D Shape Completion: Reformulated **depth estimation** as iterative refinement via learned **velocity fields** and LoRA adaptation for novel object categories, Improving **Chamfer Distance by 9.3%** on RaySt3R.

Pothole Detection and Severity Estimation: Won **SDAIA Smartathon Hackathon** (Road Safety Track) among **1,000+ submissions** by training Mask R-CNN (82% acc.) and **3D reconstruction** pipeline for severity assessment.