

ATHARV GOEL

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Education

Carnegie Mellon University

Master of Science in Machine Learning

Dec 2027

Pittsburgh, PA

Relevant Coursework: 11-868 (LLM Systems), 10-715 (Advanced Topics in ML), 36-700 (Mathematical Statistics)

Indraprastha Institute of Information Technology (IIIT) Delhi

Bachelor of Technology in Computer Science & Engineering | **GPA: 3.8/4.0**

May 2025

New Delhi, India

Relevant Coursework: Reinforcement Learning, Meta-Learning, Computer Vision, Statistical Machine Learning, Explainable AI

Experience

Spyne AI

Applied AI Researcher

Feb 2026 – May 2026

Gurugram, India

- Built an automated visual QC pipeline for dealership images using VLM foundation models (CLIP, DINOv3, SAM3), processing 100K+ images/day and cutting manual review by **~60%**.
- Engineered a blob-based segmentation quality checker (local texture estimation + morphological filtering) to auto-flag noisy masks before downstream validation, improving pipeline reliability at scale.

tbo.com

Software Engineer

Jun 2025 – Jan 2026

Gurugram, India

- Redesigned hotel-search API architecture across S3, DynamoDB, and Aerospike, cutting end-to-end latency **~5x (20s → 4s)**.

Research Experience

Infosys Centre for AI, IIIT Delhi – Advisor: Prof. Saket Anand

Undergraduate Thesis – Computer Vision

Dec 2023 – Jul 2025

New Delhi, India

- Formulated CMAP [1], an active-learning criterion by connecting classifier weight correlation with Neural Collapse geometry; scored samples by their predicted perturbation of the learned class geometry.
- Achieved **20% fewer labels on ImageNet** while improving out-of-distribution generalization; validated across OOD detection, long-tail imbalance, transfer learning, and novel-class discovery.

Datalab @ IIIT-Delhi – Advisor: Prof. Gautam Shroff

Research Assistant – Reinforcement Learning

Jan 2025 – Jun 2025

New Delhi, India

- Trained PPO agents with a custom CNN policy on a curriculum of grid-world manipulation tasks, bootstrapped via imitation learning from a BFS planner.
- Found that agents learned task-specific mappings but failed to transfer latent task structure across environments; joint online RL and offline distillation improved within-task convergence but not cross-task generalization.

Publications

- [1] **Reliable Active Learning from Unreliable Labels via Neural Collapse Geometry.** Atharv Goel*, Sharat Agarwal*, Saket Anand, Chetan Arora. *NeurIPS 2025 Workshop on Reliable ML*.
- [2] **Just Add Geometry: Gradient-Free Open-Vocabulary 3D Detection Without Human-in-the-Loop.** Atharv Goel, Mehar Khurana. *arXiv, 2025*.

Projects

Neural Analogical Reasoning for ARC-AGI

[Report](#)

- Built a reasoning system achieving **41% accuracy** on ARC-AGI (near-SOTA ~51% at the time) via neurosymbolic program synthesis and test-time adaptation, fine-tuning the meta-learned base LLM with **QLoRA** on symbolically-augmented task instances.
- Designed a custom DFS decoding strategy over candidate token sequences (vs. greedy sampling), with pruning heuristics preserving greedy's time complexity

OV3D: Open-Vocabulary 3D Object Detection Without 3D Supervision

[Paper](#) | [Code](#)

- Developed a zero-shot 3D object detector [2] by lifting 2D foundation-model predictions to 3D via camera geometry and LiDAR.
- Designed and produced a weather/sensor-noise robustness benchmark grounded in physics-based fog simulation (exponential transmittance) and unreliable LiDAR, exposing severe failures under sensor and distribution shift.

Technical Skills

Languages: Python, C++, C, JavaScript/TypeScript, SQL

ML/AI & Systems: PyTorch, Transformers, OpenCV, NumPy, Scikit-learn, CUDA, Linux, Docker, Git, AWS, GCP

Awards

- Best Teaching Assistant Award, IIIT Delhi:** led 6 TAs for Computer Vision (150+ students) and conducted office hours.
- Distinguished Academic Excellence Award (IIITD):** 3 A+ grades in graduate AI courses (Computer Vision, Meta-Learning, Explainable AI) | **Dean's List** (2024–25)