Ayush Chaudhary

ayushch1183@gmail.com | linkedin.com/in/ayush1183 | github.com/Ayush-Chaudhary | College Park, MD

Education

University of Maryland — College Park, MD
Masters of Science in Applied Machine Learning **(GPA: 4.0)** — Expected Graduation: May 2025

Indian Institute of Technology — New Delhi, India
B.Tech in Electrical Engineering with Minor in Computer Science **(GPA 9.1/10)** — May 2023

Technical Skills

Languages	**Proficient:** Python(5 yrs), C++(4 yrs), MATLAB, **Familiar:** C, Java, Java Script, Dart
Tools & Libraries	**MLOps:** PyTorch, TensorFlow, Docker, Kubernetes **Cloud Computing:** AWS **Databases:** SQL **Other Tools:** Matplotlib, Tableau, GitHub, HTML, LaTeX, Flutter
Interests	Computer Vision, Language Learning Models, Reinforcement Learning, Gen AI, Backend Web Development, Software Development, Statistical Analysis, Pattern Recognition

Industry Experience

Mirage Lab, UMD — College Park, MD
Machine Learning Researcher — June 2024 - Present

- Traditional metrology required manual measurement extraction, repeated for each part design using Hough Transforms.
- The new pipeline uses **LSD**, **ElDet** models, and a **fine-tuned LLM (GPT-4)** to automate dimension analysis from grayscale images, generalizing for any design with linear, elliptical, and circular features.
- This method achieves a **95%** reduction in measurement time per part, decreases manual programming time from **6 hours to 8 minutes** per design, and improves measurement uncertainty from **120 μm to 40 μm.**

Mastercard — Gurgaon, India
Machine Learning Engineer — June 2022 - July 2022

- Launched a **robust pipeline** of aggregate functions on **100k** data points, increasing the report generation speed by **80%**.
- Integrated Large Language Models such as Copynet and **GPT2** to train the extracted features, resulting in improved accuracy and efficiency in **identifying potential money laundering activities** by **30%**.
- Model deployment **automates manual tasks** performed by analysts, saving approximately **1800** man hours annually.

Research Experience

Transformer-based 3D motion estimation — College Park, MD
Research Assistant at Teli's Lab — Nov 2023 - May 2024

- Developed a robust framework for 3D motion estimation in videos by integrating FlowFormer++ for **optical flow**, YOLOv8 for **object detection**, and GLPN for **monocular depth estimation**, achieving high accuracy and efficiency.
- Demonstrated exceptional **motion detection accuracy** (MDA) of **94.61%** and minimal **flow direction perturbance** (FDP) of **0.127** across diverse video datasets, showcasing the framework's effectiveness in real-world scenarios.
- Enhanced autonomous navigation, augmented and virtual reality, surveillance, sports analytics, and healthcare by providing detailed object motion analysis, contributing to improved operational effectiveness and user experiences.

Handling Distribution change in Multiarm Bandits — IIT Delhi, India
Research Assistant with Prof. Gourab Ghatak — Aug 2022 - Nov 2022

- Created an innovative algorithm using **Dynamic Multiarm Bandits** to optimize portfolio performance by **20%**.
- Remodelled a novel approach to make the exploratory MAB algorithm resilient to changes in the distribution.
- Performed extensive research and analysis to derive an upper bound on the probability of eliminating an arm with a **modified mean probability distribution**, ensuring the algorithm's effectiveness in various scenarios.

SEMG-based Gesture Recognition using 3D CNN — IIT Delhi, India
Research Assistant with Prof. Lalan Kumar — May 2021 - July 2021

- Devised a **gesture recognition CNN** using isometric and isotonic finger gestures from 18 subjects.
- Adapted a 3D-CNN architecture to better capture **spatial and temporal dependencies**, improving system robustness.
- Compared 2D and 3D convolution approaches, achieving an **accuracy boost: 97.1% to 98.6%** with the 3D method.