Sarah Pendhari

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EDUCATION

Carnegie Mellon University   **Pittsburgh, PA**
Master of Science, Computer Vision, School of Computer Science GPA: 3.33/4.0   *Dec. 2026*
Coursework: Visual Learning and Recognition, Adv Computer Vision, ML, Adv DL (PhD), Robot Localization & Mapping

University of Mumbai   **Mumbai, India**
Bachelor of Engineering, Computer Engineering GPA: 9.22/10.0 | Principal's Excellence Award (top 0.03%).   *Jul. 2025*

SKILLS

Programming Languages: Python, C, C++
Tools and Frameworks: PyTorch, Tensorflow, NumPy, Pandas, SciPy, OpenCV, Keras, Git, Linux, Docker, AWS (EC2), SQL
AI Related Tech Stack: NLP**,** LLMs, VLMs, RAG, Diffusion, Fine-tuning, Multi-modal, Image/Video Generation

EXPERIENCE

Team Chiron – The AIRLab at CMU| Prof. John Galeotti (Capstone Project)   **Pittsburgh, PA**
Research Assistant   *Jan. 2026-Present*
- Developing a VLM for UAV RGB video as part of the **DARPA Triage Challenge** (U.S. federal-funded), enabling person tracking, re-identification, and temporally grounded event understanding in complex, real-world scenes.
- Leading large-scale data pipeline and annotation setup (Label Studio) for **UAV video**, supporting robust evaluation of multimodal perception and long-horizon reasoning.

CMU Tepper School of Business | Prof. Mohsen Foroughifar   **Pittsburgh, PA**
Research Assistant   *Nov. 2025-Jan. 2026*
- Built a predictive video narrative model combining VLMs, LLM-based future hypothesis generation, and probabilistic uncertainty estimation, scaled on the Pittsburgh Supercomputing Center (PSC) to quantify anticipation (suspense) and prediction error (surprise) in video.

Carnegie Mellon University – Xu Lab | Prof. Min Xu   **Pittsburgh, PA**
Research Assistant   *Oct. 2025-Present*
- **ModelFabric (ICML 2026, submitted):** Proposed an explainability-guided selective shielding framework for **VLA models on edge robots**, enabling secure, low-latency deployment via optimized partial TEE execution (up to **4.7× faster** than full secure inference).

University Of Mumbai | Prof. Nazneen Pendhari   **Mumbai, India**
Research Intern   *Jan. 2022 – Mar. 2025*
- *Project 1 – ColourViTGAN*: Investigated data-efficient visual representation learning, developing a ViT-CycleGAN hybrid that improves semantic colorization quality **(+2.2 PSNR, 0.982 SSIM)** for **240K+ images**, enabling low-latency deployment. Best Paper IEEE ICUIS Link
- *Project 2 – Retinal Diagnosis via FSL*: Designed attention-based Few Shot Learning models for medical imaging, achieving **0.947 AUC** with only **5% labeled data**, scaling efficiently via **mixed-precision multi-GPU training** (V100). Best Paper IEEE IATMSI Link

IIT Bombay | Prof. Surya Durbha   **Mumbai, India**
Summer Intern   *Jun. 2024 – Aug. 2024*
- **Programmed embedded C/C++ firmware on ESP32**, optimizing LoRa connectivity for real-time streaming of 10K+ daily sensor signals.
- Built a **low-latency** forecasting model for environmental signals, achieving +**32.3%** over baseline via adv signal processing and ensemble learning, worked in a team of 5.

Wondrlab India Pvt. Ltd   **Mumbai, India**
Software Developer Intern   *Jun. 2023 – Sep. 2023*
- Optimized Airflow-based ML data pipelines, boosting ETL throughput by **9.2%** with parallel orchestration and feature reduction.
- Built a high-concurrency scraping + MongoDB ingestion system enabling **real-time analytics dashboards** for cross-team insights.

ACADEMIC PROJECTS

CardioCare: AI for Cardiac Risk, Final Year Thesis | University of Mumbai   *Sep. 2024 – Jun. 2025*
- Built a multimodal cardiac diagnosis assistant using **RAG on patient records** for information retrieval **+ ECG + medical text**, achieving **76.8% EM and 0.83 F1**, outperforming GPT-3.5 by **15%** on clinical benchmarks.
- Fine-tuned an **LSTM arrhythmia classifier (48 MIT-BIH classes)** with chain-of-thought prompting, reaching **0.875 AUC** and leading a **4-member team** from model design to validation.

PUBLICATIONS

- ModelFabric: Explainability-Guided Selective Shielding for Secure Vision-Language-Action Models on Edge Robots, ICML '26 Submitted
- Attention-Enhanced Prototypical Networks for Few-Shot Microaneurysm Detection in Diabetic Retinopathy Images, IEEE, May 2025
- ColorViTAN: A hybridised approach using Vision Transformers and CycleGAN to add color to greyscale images, IEEE, Jan 2025
- Benchmarking Deep Learning Models for Automated MRI-based Brain Tumor Detection: In-Depth Analysis of CNN, VGG16, VGG19, ResNet-50, MobileNet, and InceptionV3 – IJCA, Nov 2024
- Advanced Neural Network-Based Color Transformation for Enhanced Visual Perception in Tritanopia Using Deep Learning Algorithms Taylor and Francis, Submitted Jan 2025