Ishaan Singh

sing1775@purdue.edu | LinkedIn: linkedin.com/in/isingh-boilermaker | GitHub: github.com/ishaan-59

EDUCATION

Purdue University - Elmore Family School of Electrical and Computer Engineering — **West Lafayette, IN**
B.S. Computer Engineering, Concentration in Artificial Intelligence and Machine Learning — Expected May 2028
- Dean's List: Fall 2024 – Spring 2026 — GPA: 3.54/4.00

PROJECTS

Cross-Dataset Pedestrian Detection and Edge Deployment — **Mar 2026 – Present**
Computer Vision and Edge AI Project – YOLOv8m, Kaggle, NVIDIA Jetson

- Trained **six YOLOv8m detectors** across Caltech, CityPersons, and CrowdHuman; executed a **6-model × 4-domain evaluation matrix (24 evaluations)** using precision, recall, mAP50, and mAP50–95.
- Identified CrowdHuman-only as the strongest external-domain model on **10,000 BDD100K images**, reaching **0.246 mAP50–95** and revealing direction-dependent transfer behavior.
- Deployed YOLOv8m on an **NVIDIA Jetson Orin Nano** with Docker and TensorRT; FP16 reduced 512×512 inference latency from **34.4 ms to 9.6 ms (~3.6× faster)** while preserving **0.211 mAP50–95**.

Mammography Cancer Classification and Lesion Analysis — **Jun 2026 – Oct 2026**
Independent Deep Learning Project - PyTorch, ResNet-50, OpenCV, pydicom

- Built an end-to-end **CBIS-DDSM mammography pipeline** on **2,687 images at 1024×640** with patient-level train/validation/test splits, combining ResNet-50 classification, lesion segmentation, Grad-CAM, and integrated inference.
- Achieved **0.823 validation / 0.698 test ROC-AUC** with fine-tuned ResNet-50.
- Improved segmentation Dice **0.153→0.357** via **ResNet50-U-Net** transfer learning; **0.369 test Dice**.

Geofence Go-Kart Safety System — **Aug 2025 – Dec 2025**
Purdue EPICS – Raspberry Pi Pico, GPS, IMU

- Built a Raspberry Pi Pico geofencing prototype integrating **GPS and IMU data** with a web-based map for boundary definition, CSV coordinate export, and on-device real-time vehicle-position monitoring.

RESEARCH

Research Assistant - Political Deepfakes Incident Database (PDID) — **Feb 2026 – Present**
Governance & Responsible AI Lab (GRAIL), Purdue University

- Developed modular **Python media-enrichment tooling** for image, video, and audio, integrating **Qwen2.5-VL**, OCR, audiovisual metadata extraction, and multimodal LLM/VLM processing for structured database ingestion.
- Mapped a **53-field Airtable schema** into automated research workflows, including **22 LLM/VLM-generated fields** for visual descriptions, targets, harms, communication goals, framing, and policy narratives.

LEADERSHIP & TEACHING

Supplemental Instruction Leader — **Aug 2026 – Present**
Purdue Academic Success Center

- Lead collaborative Supplemental Instruction sessions for Multivariable Calculus (MA 261), designing review activities and facilitating peer-based problem solving to reinforce challenging course concepts.

Treasurer — **Jan 2026 – Aug 2026**
Delta Chi - Purdue Chapter

- Managed financial operations for chapter with a **$60,000 annual budget serving 50+ members**.

Undergraduate Teaching Assistant — **Aug 2025 – May 2026**
Purdue First-Year Engineering Program

- Supported **100+ ENGR 131/132 students** in prototyping, Excel analysis, MATLAB modeling, and TI hardware troubleshooting. Graded **100+ technical assignments per month** with structured feedback.

TECHNICAL SKILLS

Languages | Python, C, MATLAB, SQL
Machine Learning & Computer Vision | PyTorch, torchvision, TensorFlow, Ultralytics YOLO, OpenCV, scikit-learn
Systems & Deployment | Linux, Docker, NVIDIA Jetson, CUDA, TensorRT, Raspberry Pi Pico
Data & Tools | Git, GitHub, pydicom, Tesseract, Kaggle, NumPy, pandas, Matplotlib