Yug Patel

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Education

Missouri University of Science and Technology — Rolla, MO
*Bachelor of Science in Computer Science; GPA: **3.8*** — *Aug 2022 – Dec 2026*

Experience

Software Engineering/Data Science Co-op — May 2025 – Jan 2026
Hunter Engineering Company — *Bridgeton, MO*

- Developing in-house license plate recognition system projected to save estimated **$2M+ annually** by replacing third-party vendors across **5,000+** nationwide service centers.
- Boosted model accuracy from **78%** to **97%** on **1k+** plate designs by optimizing computer vision pipeline through iterative refinement, data augmentation, custom tuning, and edge-case optimization.
- Reduced manual labeling by **75%** for **3M+ images** via active learning and pseudolabeling pipelines.
- Engineered a web annotation tool with **REST APIs**, achieving **3**× faster labeling and automating model training.
- Built **real-time** inference pipeline processing **10k+ plates/hr** using multi-threading and parallel processing.

ML/Data Engineering Contractor — Jan 2025 – Aug 2025
U.S. Geological Survey (USGS) — *Remote*

- Processed **100+ TB** of geospatial data using distributed processing for nationwide water resource analysis.
- Built **ETL pipelines** extracting geospatial features for downstream water resource modeling.
- Automated waterbody detection at **92% accuracy** across U.S. using supervised learning and clustering.
- Optimized **HPC** workflows in **C++/Python** reducing compute time by **70%** for large-scale data processing.
- Created Python library and CLI tools used by **10+ researchers** to analyze hydrographic data.

AI Research Intern — May 2024 – Aug 2024
National Science Foundation — *Rolla, MO*

- Developed testbed achieving **sub-ms** sensor synchronization, enabling high-fidelity cognitive workload analysis.
- Created **Spiking Neural Network** models for real-time cognitive workload detection on edge devices.
- Conducted systematic literature review of **30+** papers on neuromorphic computing for biosignal processing.
- First-authored paper on reconfigurable testbed design published in **ASEE conference proceedings**.

Undergraduate Research Assistant — Aug 2023 – May 2024
CS & Biology Departments, Missouri S&T — *Rolla, MO*

- Developed disaster tweet classifier with **89% F1-score** on **47K+** tweets, outperforming baselines by **15%**.
- Built biological simulations for researchers to model population dynamics of **100K+** microscopic organisms.
- Automated lifecycle detection using YOLOv8 on **5K+** microscopy images, reducing manual classification by **90%**.

Projects

FlightNet – Spatiotemporal Flight Delay Prediction | PyTorch Geometric, XGBoost, Streamlit — Aug 2024

- Modeled **3M+ flights/300 airports** as a temporal graph with FAA schedules and NOAA weather data.
- Achieved **82% accuracy** for 3-hour delay forecasts with **Graph Attention Networks** and time-decayed edges.
- Outperformed XGBoost baseline by **25%**, validating graph neural networks for real-world delay prediction.

HomeLab | Docker, Linux, LLaMA, OpenWebUI, Jellyfin, Navidrome, Gitea, Nextcloud — Jan 2024

- Built a personal server on Linux with Docker-managed services for media, cloud, and development.
- Deployed tools like Jellyfin (media), Navidrome (music), Gitea (code hosting), and Nextcloud (cloud).
- Hosted **LLMs (LLaMA)** and **RAG pipelines**, integrating personal notes/Wikipedia into local AI assistants.

PiEAH – Raspberry Pi Edge Automation Hub | Raspberry Pi, Home Assistant, Pi-hole, Grafana — Mar 2024

- Configured a **Raspberry Pi hub** with **Home Assistant** to automate IoT devices and sensors.
- Deployed **Pi-hole** for DNS-level filtering and integrated **Grafana** dashboards for network monitoring.

Technical Skills

Languages: Python, Java, C/C++, JavaScript, MATLAB, R
Frameworks & Libraries: PyTorch, TensorFlow, React, Node, FastAPI, Spring Boot, Pandas, OpenCV
Tools & Platforms: Docker, Git, Linux, CUDA, AWS, Azure, Spark, PostgreSQL, Redis