Yug Patel

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Education

Missouri University of Science and Technology Rolla, MO
Bachelor of Science in Computer Science; Minor in Mathematics and Statistics; GPA: 3.8 *Aug. 2022 – Dec. 2025*

Experience

Computer Vision/Data Science Co-op May. 2025 – Present
Hunter Engineering Company *Bridgeton, MO*

- Led technical enhancements of Hunter's Automatic Number Plate Recognition (ANPR) system, a core component of its vehicle servicing products, to handle thousands of diverse and evolving plate designs.
- Created a two-stage recognition model that boosted system accuracy by 10%; this involved fine-tuning the primary YOLOv9 detector and adding a Vision Transformer (ViT) to handle character recognition on novel plate types.
- Developed a data pipeline with active learning and pseudo-labeling to automatically identify high-impact training data, cutting manual annotation needs by 75% across a 150,000+ image library.
- Improved the manual annotation process by building a set of custom web applications for data labeling and review, which increased annotation throughput by nearly 3x.

Machine Learning Programmer (Student Contractor) Jan. 2025 – Present
U.S. Geological Survey (USGS) *Remote*

- Developed automated ML workflows for large-scale geospatial analysis, reducing the processing time for the USGS's national map updates from weeks to hours.
- Engineered a feature extraction pipeline (e.g., calculating zonal statistics, geometric attributes) to process and harmonize terabytes of diverse hydrographic data, creating analysis-ready datasets using GeoPandas and Rasterio.
- Applied machine learning models to the extracted features for critical hydrographic analysis, including performing unsupervised clustering (K-Means, DBSCAN) for density assessments and classifying water body characteristics.

CS Research Intern May. 2024 – Aug. 2024
National Science Foundation *Rolla, MO*

- Designed and constructed a multi-modal data acquisition platform for cognitive load analysis, achieving sub-millisecond synchronization of high-frequency EEG and PPG sensor streams via Lab Streaming Layer (LSL).
- Developed a low-latency, real-time data processing pipeline in Python, applying digital band-pass filters to reduce signal noise by 40% and extract high-fidelity features for model ingestion.
- Enabled on-device cognitive workload classification by implementing a power-efficient Convolutional Spiking Neural Network (CSNN) in snnTorch.

Undergraduate Research Assistant Aug. 2023 – May. 2024
Depts. of Computer Science & Biological Sciences, Missouri S&T *Rolla, MO*

- Developed a multi-task deep learning model to classify 47,000+ disaster-related tweets for event-type, relevance, and urgency. The model's architecture, combining a transformer base (RoBERTa), a Conv1D layer, and a custom attention mechanism, achieved an 89% F1-score, outperforming baseline models by 33%.
- Led development of computational simulations to model *C. elegans* reproductive cycles and separately designed a YOLOv8 object detection model to automate the classification of the dauer larval stage from microscope imagery.

Projects

FlightNet | *PyTorch Geometric, Pandas, Scikit-Learn, Streamlit* August. 2025

- Developed a graph-based deep learning system to model and predict flight delay propagation across the U.S. aviation network by integrating millions of flight records with hourly weather data.
- Implemented a Graph Attention Network (GAT) with advanced features like multi-hop aggregation and time-decayed edge weights, achieving a 10x lower prediction error (MSE) than a strong XGBoost baseline.

Technical Skills

Languages: Python, Java, C++, JavaScript, SQL, R
Libraries: PyTorch, TensorFlow, Scikit-Learn, Pandas, OpenCV, Rasterio, GeoPandas, snnTorch
Frameworks & DBs: React.js, Node.js, FastAPI, Spring Boot, PostgreSQL, MS SQL Server, NoSQL
Tools & Cloud: Git, Docker, CI/CD, Linux, Excel, Office, VS Code, CUDA, AWS, Azure