Yug Patel

224-830-5776 | ybpkrk@mst.edu | www.linkedin.com/in/patel-yug | github.com/pateyu | pateyu.com | US Citizen

Education

Missouri University of Science and Technology — Rolla, MO
Bachelor of Science in Computer Science; GPA: 3.74 — *Aug. 2022 – Present (Expected: Dec 2025)*

Experience

NSF-REU Research Intern — May 2024 – Aug 2024
Missouri University of Science and Technology — *Rolla, MO*

- Engineered a testbed to assess cognitive load using real-time EEG (brain activity) via `MATLAB` and PPG (heart rate) sensor data via `bleak`, with precise synchronization of wearable devices to ensure high accuracy in data collection.
- Led the development of two cognitive tasks, handling both frontend and backend components.
- Developed a third Aerial Drone Navigation task by integrating `ArduPilot SITL` with the RealFlight simulator, using `pymavlink` to execute custom scripts for drone control.
- Designed and implemented a Convolutional Spiking Neural Network (CSNN) using `snntorch` to assess cognitive workload, streaming real-time EEG and PPG data via `Apache Kafka` for instantaneous predictions.

Undergraduate Research Assistant — Oct 2023 – Present
Department of Biology, Missouri University of Science and Technology — *Rolla, MO*

- Developed a comprehensive simulation program to model complex life cycles and behaviors of microorganisms, primarily generating time-series data, in collaboration with a team of biologists, ensuring biological accuracy.
- Designed and implemented an automated `ETL` pipeline using `R` and `PySpark` for real-time processing, transformation, and storage of time-series simulation data in a `PostgreSQL` database.
- Built a dynamic web application using `Django` and `WebSockets` to visualize time-series simulation data in real-time, allowing users to interact with and analyze multiple simulations concurrently.

Undergraduate Researcher — Jan 2024 – Present
Department of Computer Science, Missouri University of Science and Technology — *Rolla, MO*

- Web scraped and annotated over 27,000 disaster-related tweets with metadata applying text normalization and handling imbalanced data to build a high-quality dataset for first responder classification.
- Developed and fine-tuned a RoBERTa-based deep learning model, achieving 98% accuracy in classifying first responders across various crisis events, and built an interactive web application to visualize datasets and model predictions using `PyTorch` for training and `ONNX.js` for real-time, client-side inference in the browser.
- Scraped over 50,000 tweets, manually annotated 12,000, to develop a sentiment analysis model using BERT to automate the annotation of political ideologies, leveraging emotion detection to predict users' political leanings.

Web Developer — Jun 2023 – Aug 2023
Infosoft Systems Inc. — *Overland Park, KS*

- Collaborated closely with the design team to create visually appealing and user-friendly interfaces.
- Developed responsive web pages using `HTML`, `CSS`, `Javascript`, and `jQuery` ensuring mobile responsiveness and optimized load times.

Projects

Global Food Library | *Python, Flask, SQLAlchemy, PostgreSQL, TailwindCSS* — September 2023

- Developed a dynamic culinary platform with personalized recipe management, advanced search capabilities, and interactive tools like ratings, custom cookbooks, and dietary filters.
- Engineered a secure and scalable database infrastructure using `SQLAlchemy` with `PostgreSQL`, implementing admin controls, user authentication, and role-based access.
- Integrated `RESTful APIs` to facilitate real-time interactions between the user interface and backend, enabling seamless recipe uploads and retrievals.
- Styled the front-end using `TailwindCSS`, ensuring a consistent and user-friendly design across the application.

Technical Skills

Languages: Java, Python, C, C++, SQL, JavaScript, TypeScript, C#, Rust, MATLAB, R, Swift
Frameworks & Libraries: React, Node, Express, Flask, Django, Spring Boot, TailwindCSS, Bootstrap
Developer Tools: Git, Docker, AWS, Linux, Kafka, Snowflake, ML Flow, Excel/Office, Tableau
Libraries: Pandas, Matplotlib, XGBoost, Scikit-Learn, D3.js, PyTorch, TensorFlow, Selenium, PySpark, ONNX.js