

SAYOJYA PATIL

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SUMMARY

Full stack engineer with 2.5+ years building React and TypeScript frontends, from interactive 3D interfaces to JWT/OAuth2-secured REST APIs and CI/CD. Strong in Next.js, FastAPI, PostgreSQL, and Docker, owning features from design to production in agile, cross-functional teams.

PROFESSIONAL EXPERIENCE

Student Researcher | HBK World, Michigan, USA

Jun 2025 – Present

- Shipped a guided React and Three.js frontend with interactive 3D visualization, sensor placement, and live result streaming.
- Delivered a configurable module running real-time sensor analysis on any bridge geometry and sensor layout without code changes.
- Converted research algorithms locked in single-use scripts into production software for their structural health monitoring platform.
- Exposed MLRun analysis functions through a configuration REST API so engineers run analyses without touching research code.
- Cut experimentation overhead by **40%** by deploying **20+** independent MLRun serverless functions on Kubernetes, packaged with Docker.
- Kept **20+** functions independently releasable through GitHub Actions CI/CD, with code review, automated testing, and deployment validation.

Research Assistant | University of Michigan-Dearborn, Michigan, USA

Jun 2025 – Present

- Architected a Python ingestion platform unifying **4** incompatible public APIs (USGS, PRISM, GridMET, GeoGLOWS).
- Built asynchronous ingestion with schema validation, retry logic, and rate-limit handling, resilient to upstream API failures.
- Enabled model training on **40+ years** of daily readings from **100+** sites, migrating storage from InfluxDB to MLRun workflows.
- Contributed to a two-stage ML pipeline (TensorFlow, PyTorch) supporting an **88%** RMSE reduction over physics-only baselines.
- Added KGE-based drift detection that scores live model output, flags degradation against baseline, and triggers automatic retraining runs.

Software Engineer | IDS Technologies, Karnataka, India

Jun 2023 – Jul 2024

- Cut report generation time by **30%** for **100+** daily users by shipping a Kotlin Android PLC batch reporting module for industrial automation systems.
- Reduced average complaint resolution time by **20%** with a complaint management module handling **500+** monthly cases end to end.
- Designed reusable networking, validation, and exception-handling components adopted across three modules, cutting integration defects.
- Maintained a **99%** crash-free rate by root-causing recurring UI, local storage, and backend sync defects that drove repeat support escalations.

Backend Engineer Intern | Vayavya Labs Pvt. Ltd., Karnataka, India

Sep 2022 – May 2023

- Built Dockerized Flask microservices and JWT-secured REST APIs powering the DDGen driver-generation platform used by partner hardware teams.
- Reduced manual device configuration effort by **50%** through automated generation workflows, shortening new-device onboarding.
- Profiled and optimized backend processing pipelines, cutting execution time **18%** and driver generation effort **40%** for end users.
- Designed input validation and structured exception handling adopted platform-wide, cutting integration failures across partner teams.

PROJECTS

Chicago Food Safety BI Platform

Python, FastAPI, PostgreSQL, React, Recharts, Vite

- Built an end-to-end web platform: Python ETL ingesting 50K+ inspection records from a public Socrata API into normalized PostgreSQL.
- Served aggregated metrics through FastAPI REST endpoints to a React and Recharts frontend with trend analysis and failure maps.
- Separated ETL, REST API, and visualization layers behind clear interfaces for independent iteration across the stack.

AI-Powered Loan Management Platform

Django, DRF, PostgreSQL, Redis, Celery, Docker, OpenAI API

- Replaced manual loan document review with agentic processing and approval workflows orchestrated on Celery and Redis task queues.
- Integrated the OpenAI API for document summarization and decision support, returning structured recommendations to reviewers instead of raw text.
- Designed DRF REST APIs and a normalized PostgreSQL schema with optimized indexes to support concurrent, AI-driven loan workflows.
- Containerized API, worker, and database services with Docker for reproducible development and consistent deployment.

Clinical AI Note Summarizer

FastAPI, GPT-4o Vision, PydanticAI, SQLAlchemy, PostgreSQL

- Built a FastAPI pipeline that extracts, summarizes, and structures handwritten and scanned clinical records end to end using GPT-4o Vision.
- Secured API endpoints with JWT/OAuth2 authentication and covered auth, extraction, and storage paths with PyTest suites.
- Validated model output against PydanticAI schemas before persisting to PostgreSQL through SQLAlchemy.
- Deployed to Railway with automated build and release pipelines.

EDUCATION

M.S. in Computer and Information Science

University of Michigan-Dearborn, USA

Apr 2026

GPA: 3.77/4.0

Relevant Coursework: AI, Trustworthy AI, Big Data, Operating Systems, Computer Networks, Algorithm Analysis & Design

B.E. in Computer Science and Engineering

Visvesvaraya Technological University, India

Jun 2023

GPA: 3.50/4.0

SKILLS

Languages: Python, TypeScript, JavaScript, Java, Kotlin (Android), Go, SQL

Frontend: React, Next.js, Vite, Three.js, Tailwind CSS, HTML, CSS

Backend: FastAPI, Flask, Django, REST APIs, SQLAlchemy, Redis, Celery, JWT/OAuth2, PyTest

Cloud & DevOps: AWS, GCP, Firebase, Docker, Kubernetes, CI/CD (GitHub Actions, GitLab CI), Linux

Databases: PostgreSQL, MySQL, SQL Server, MongoDB, InfluxDB

AI/ML & Data: PyTorch, TensorFlow, scikit-learn, pandas, NumPy, OpenAI API, GPT-4o Vision, PydanticAI, Agentic AI, MLRun

Software Engineering: Distributed Systems, Microservices, System Design, Event-Driven Architecture, OOP, Design Patterns, Data Structures & Algorithms, SDLC, Agile, Git, Code Review

AI-Assisted Development: Claude Code, GitHub Copilot, ChatGPT