Mohammed Elshrief

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TECHNICAL SKILLS

Languages: Python, R, SQL, Go, C, C++, JavaScript/TypeScript
Libraries: NumPy, Pandas, Flask, FastAPI, Django, Pydantic, Pytorch, Scikit-learn, LightGBM, React, Next.js, Svelte
Tools: Git, Docker, Bash, Postman, PostgreSQL, MongoDB, Jenkins, Jira, AWS, GCP, Power BI, Tableau, Excel

EXPERIENCE

Software Engineer
May 2025 – August 2025
LiftWerx
Cambridge, ON

- Spearheaded the end-to-end development of an internal tooling suite, architecting a full-stack solution with a **FastAPI** backend, **MongoDB** database, and a reactive **Svelte** frontend to automate critical sales team workflows
- Engineered a predictive analytics service by integrating a **LightGBM** model with weather forecast APIs, creating a **FastAPI** endpoint to forecast operational delays; improving delay accuracy and future project resource allocation
- Architected a centralized quoting system with **Pydantic** data validation in **MongoDB**, slashing quote generation time from hours to minutes and eliminating **100%** of data inconsistency errors by establishing a single source of truth

ML Project Developer
May 2025 – August 2025
University of Toronto Machine Intelligence Student Team
Toronto, ON

- Engineered a full-stack, human-in-the-loop data annotation tool to accelerate active learning by implementing sample ranking algorithms (uncertainty, diversity sampling) in **PyTorch** that guide annotators to the most informative data.
- Developed the frontend interface in **React** to visualize model uncertainty and render prioritized data queues, collaborating directly with stakeholders at **ThemisAI** to translate company requirements into product features.

Research & Data Analyst
September 2025 – Present
Tech+ UW
Waterloo, ON

- Developing a data analysis pipeline in **Python** (**Pandas, SciPy**) to process and model quantitative and qualitative survey data, uncovering key drivers of student engagement and retention.
- Synthesized analytical findings into data-driven reports and visualizations for leadership, directly influencing the organization's strategic roadmap and informing new program development.

AI Trainer
Sept 2024 – Present
Outlier AI
Remote

- Enhanced large language model performance by creating targeted instruction-tuning datasets and analyzing output logs to diagnose logical errors and hallucinations, resulting in a **20%** reduction in error rates and false-positives

PROJECTS

↪ Urban Sentinel – Municipal Decay Prediction | *FastAPI, React, TypeScript, LightGBM, Docker, Mapbox*

- Architected and deployed an end-to-end urban intelligence platform using **Docker**, serving a **React/TS** frontend and a **Python/FastAPI** backend to create labeled & ML-driven map predictions for urban decay hotspots in Toronto
- Engineered a performant data pipeline and API that processes geospatial data and serves a **LightGBM** model with **94.4% accuracy**; optimized frontend rendering to visualize **10,000+** data points at **30fps**

↪ SentimentMD – Telemedicine Intelligence Platform | *Next.js, Express.js, WebSockets, Hume AI, Twilio*

- Developed a real-time telemedicine platform using **Next.js/TypeScript** and **Express.js**, building a resilient **WebSocket** architecture to stream live audio/video to Hume AI for sub-second emotional analysis
- Integrated Google's **Gemini API** to automate clinical report generation and engineered a synchronized data pipeline to overcome latency, ensuring real-time alignment of video, audio, and AI insights

↪ Scam-Mah – Conversational AI Scammer Honeypot | *Python, Flask, HTML/CSS/JS, Gemini API*

- Achieved **3rd place** among **100+ competing teams** at UofT's NewHacks by architecting a full-stack solution integrating **Google's Gemini API**, **ElevenLabs TTS**, and a **Flask** backend that wastes phone scammers' time
- Engineered the core spam detection model using **StandardScaler** and **IsolationForest** algorithms to analyze call patterns, achieving **90% accuracy** in identifying and flagging potential scams.

↪ Paybridge Technologies – Fintech Transaction System | *Python, React, PostgreSQL, Docker*

- Architected a secure, full-stack payment platform with a **React** frontend and a **Python/PostgreSQL** backend to facilitate secure cross-platform (Venmo, PayPal, Cash App) financial transactions
- Launched a successful beta, onboarding **50+ users** and processing over **$1,000** in transactions, validating the platform's core payment processing and security model

EDUCATION

🎓 University of Waterloo
Sep. 2024 -
Bachelor of Applied Science in Management Engineering, Option in Artificial Intelligence
Waterloo, ON