Hassan Khurram

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Education

University of Toronto Toronto, Ontario
BASc in Engineering Science, Machine Intelligence Major *April 2025*

cGPA: 3.53/4.00
Thesis: Scalable Near-optimal Linear Predictive Clustering in Non-separable Spaces via Mixed Integer Programming

Technical Skills

AI & Analytics: GenAI (RAG, prompt-engineering), ML Ops, Predictive Modelling, Clustering, Agentic AI, AI Governance & Ethical-AI
Languages & Tools: Python, SQL, R, scikit-learn, PyTorch, TensorFlow, Hugging Face, PowerPoint, Excel
Cloud & Data: GCP (BigQuery, Vertex AI), Azure Synapse, Apache Airflow, dbt, Docker, CI/CD, ETL/ELT
Collaboration: Workshop Facilitation, Storytelling Decks, Agile, Jira, Confluence, KPI Dashboards

Work Experience

Scotiabank May 2023 – Aug 2024
Data Scientist Intern *Toronto, Ontario*

- Engineered and deployed ML models (K-means and XGBoost) for churn, product-propensity, and customer-segmentation on over 10 million banking records; tuned for class imbalance and lifted weighted F1 by 15%, driving a 12% lift in campaign response.
- Built and productionized automated data and model pipelines using Apache Airflow DAGs, cutting model training, evaluation, explanation, and monitoring time by half in collaboration with cross-functional teams.
- Developed cloud-native ML workflows using Google Cloud (Vertex AI, BigQuery), reducing latency and operational costs while supporting enterprise-scale AI deployment and model monitoring strategies.
- Built and presented visual storytelling decks to senior leadership and conducted live coaching demos for business and analyst teams, showcasing model performance, interpretability, and governance alignment with regulatory standards.

Data-Driven Decision Making Lab, University of Toronto May 2022 – Aug 2022
Undergraduate Research Assistant *Toronto, Ontario*

- Researched and developed a scalable novel clustering algorithm leveraging a mixed-integer program for large operational datasets of over 1 million data points, enabling predictive insights and actionable data relationships.
- Contributed to academic and industry knowledge dissemination by co-authoring a paper accepted at AAAI 2023, "Scalable and Globally Optimal Generalized L1 K-center Clustering via Constraint Generation in Mixed Integer Linear Programming", one of the leading global conferences in AI research.
- Coordinated with a master's student and a Vector Institute affiliate professor to optimize approaches and create sophisticated data visualizations.

Projects

HomeAI: Interior Design Image Augmentation Tool Jan 2025 – Present

- Deployed an Angular frontend and Docker in the backend using ChatGPT API and custom CNN image-augmentation models to generate furniture and layout suggestions on user photos, with automated prompt-pipeline error handling.
- Won first place at the AMD Canada-wide Innovation Showcase.

Capstone: RAG Chatbot for Engineering Consulting Reports Sep 2024 – Dec 2024

- Architected a containerized RAG chatbot incorporating OpenAI embeddings and vector DB with custom prompt templates to index and query 200+ reports, achieving a few-second response.
- Built Python/TypeScript microservices and interactive UI for secure generative chat; embedded proprietary summarization IP, handled hallucination edge cases with retry logic, and presented Azure cloud deployment strategy to senior leaders.