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Mariam Walaa

MSc Applied Mathematics

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EDUCATION

Master of Science in Applied Mathematics (cGPA 4.13/4.33), *Toronto Metropolitan University* 09/2023 — 04/2025
Thesis: Analysis & Predictability of Centrality Measures in Competition Networks (published in WAW'25)

Honours Bachelor of Science in Mathematics, *University of Toronto* 09/2018 — 04/2023
Minors & Courses: Statistics, GIS, Computer Science

TECHNICAL SKILLS

Languages & Tools	Python, SQL, R, Git, Jupyter, PowerBI, Anaconda, \LaTeX
Cloud & MLOps	Azure (Azure ML, Databricks), AWS (S3, SageMaker, Lambda), GCP (BigQuery, Airflow), Docker
Software Packages	pandas, NumPy, Matplotlib, Scikit-Learn, xgboost, PyTorch, statsmodels, spaCy, PySpark, Tidyverse

INDUSTRY EXPERIENCE

AI Researcher 05/2024 — 05/2025
Unilever
Toronto, Ontario

- Applied a heterogeneous Graph Neural Network in PyTorch Geometric to learn embeddings and recommend sustainable substitutions for 27k+ ingredients, boosting greenhouse gas emissions reduction by over 400%.
- Built Azure ML pipeline with GPT-4 Turbo to validate 427 GNN recommendations against nutritional and environmental constraints, improving evaluation precision by 20% through iterative few-shot prompt optimization.

Data Science Analyst 01/2022 — 08/2022
Loblaw Companies Limited
Brampton, Ontario

- Enhanced Joe Fresh Markdown Optimization adoption rate by over 20%, by turning business requests into actionable features.
- Developed a time-series dashboard in PowerBI, a heuristic for Seasonal Product Identification to maximize sell-through, and investigated regression for price elasticity.

Machine Learning Engineer 05/2019 — 08/2021
Altair Engineering
Toronto, Ontario

- Built help documentation recommender engine, and prototypes for question answering, topic modeling, & document classifier.
- Developed novel [Simpson's Paradox automatic detection](#) feature for use in proprietary Altair KnowledgeSTUDIO ML/AI software.
- Led predictive modelling for marketing campaign using Altair KnowledgeSTUDIO, supporting [electric vehicle adoption analytics](#).

TECHNICAL PROJECTS

Open-Source Data Science Projects

Tools: pandas, NumPy, SciPy, Matplotlib, scikit-learn, spaCy, LangChain, FAISS, Streamlit UI, OpenAI API

- Developed a [RAG chatbot](#) with a vector database to retrieve user-specific experience data and generate context-aware responses.
- Developed a [recommendation system](#) GUI for arXiv research papers using NLP machine learning techniques (TF-IDF+Cosine).
- Developed a [stock portfolio optimization tool](#) with visualization capabilities and risk-return criteria selection.

ACADEMIC EXPERIENCE

Graduate Teaching Assistant 09/2023 — 04/2025
Toronto Metropolitan University
Toronto, Ontario

- MTH110/210/314 Discrete Math I & II, MTH140/240 Calculus I & II, MTH141 Linear Algebra I, and MTH380 Probability & Statistics I.

Teaching Assistant 01/2022 — 04/2023
University of Toronto Scarborough
Scarborough, Ontario

- Assisted in running labs and grading MATB61 Linear Programming & Optimization, MATA22 Linear Algebra I, CITC01 City Studies.

Research Assistant 11/2020 — 01/2022
University of Toronto
Toronto, Ontario

- Wrote 15 R tutorials and survey paper on reproducible data science workflows using LearnR, TidyModels, GitHub Actions, Targets.

SCHOLARSHIPS & AWARDS

2023/2025 TMU Graduate Scholarships & Funding	\$39,500
2022 Loblaw Companies Limited National Scholarship	\$2,500
2018 Schulich School of Business Innovative Startups Award	\$1,000
2016 Schulich School of Business Entrance Scholarship	\$2,500
2016 Home Depot Orange Scholars Homer Award	\$2,500
2015 Jr. Economic Club of Canada Scholarship	\$5,000

ACTIVITIES

Data Science Writer, KDnuggets	09-2020 — Present
Member, University of Toronto Data Lab	11-2020 — 01-2022