Madison Buitenhuis
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EDUCATION

University of Liverpool | Liverpool, England
M.Sc. in Data Science and Artificial Intelligence | Sept 2024 - Present

University of Waterloo | Waterloo, ON
B.Sc. in Honours Mathematical Physics | Aug 2023

TECHNICAL SKILLS

Languages: Python, C, SQL, DAX | **Developer Tools:** DBeaver, DBVisualizer, PowerBI, Excel, GitHub |
Libraries: pandas, PyTorch, TensorFlow, Scikit-learn, HuggingFace, OpenCV

WORK EXPERIENCE

ThoughtWire | Toronto, ON
Data Engineer Co-op | Mar 2022 - Aug 2022

- Optimized ETL pipelines to cleanse and transform data, improving customer dashboard performance.
- Designed and integrated robust SQL and M-based data metrics for PowerBI dashboards, enhancing actionable insights.
- Presented complex technical progress and data insights to consulting clients, ensuring clear project alignment and stakeholder understanding.

Scotiabank | Toronto, ON
Data Analyst Co-op | Jan 2021 - April 2021

- Developed an interactive PowerBI dashboard (SQL, Python) to identify and handle data discrepancies across multi-table datasets.
- Executed advanced PostgreSQL queries in Hadoop data lake, providing critical insights for internal team decision-making.
- Conducted in-depth research and presented a comparative study on Hadoop ecosystem vs. modern alternatives (Minio, DremIO, Kubernetes) to improve data workflows and efficiency.

Scotiabank | Toronto, ON
IT Analyst Co-op | Sept 2020 - Dec 2020

- Wrote PostgreSQL queries to manage data quality within a large Hive data lake, primarily focusing on identifying and removing duplicate records.
- Performed data analysis on extensive internal datasets to identify trends and insights, supporting various operational initiatives.

Scotiabank | Toronto, ON
Technical Analyst Co-op | Jan 2020 - April 2020

- Led data migration for internal website using Excel, ensuring data integrity for new enterprise architecture pages.

PROJECTS

Next-Action Planning in Surgical Video Analysis (M.Sc. Project)

- Developed an AI system for real-time surgical action planning and visual guidance (LMMs, diffusion models).
- Applied advanced ML techniques including feature engineering, LMM fine-tuning (Qwen), optical flow prediction, and style transfer (ControlNet) on medical video datasets.

Deep Learning Model

- Classified binary black hole mergers using a fine-tuned Bayesian neural network model (PyTorch, TensorFlow).