

Michael Furlano

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Summary

Undergraduate Industrial Engineering student (BASc '26) with a Minor in Artificial Intelligence, proficient at architecting scalable back-end services using Python, Flask, REST APIs and SQL/NoSQL databases, and crafting responsive front-end interfaces with HTML, CSS, JavaScript and React. I have end-to-end data science and ML engineering experience, building, training and deploying pipelines in TensorFlow, PyTorch and scikit-learn, and I've applied AI/ML methods in supply-chain analytics, discrete-event simulation, deep learning and graph algorithms to deliver robust, data-driven solutions within cross-functional teams.

Education

University of Toronto

Bachelor of Applied Science in Industrial Engineering

Toronto, ON

Expected Graduation, April 2026

Minor: Artificial Intelligence

Relevant Coursework: Operations Research, Data Science, Data Structures and Algorithms, Data Modelling, Engineering Economics, Systems Modelling and Simulation, Machine Learning, Artificial Intelligence, Deep Learning, Operations and Supply Chain Management

Work Experience

Forest Hill Construction and Landscaping

Construction and Landscaping Operations Intern

Bolton, ON

April 2023- Present

- Designed and rolled out a centralized digital job-scheduling system, cutting scheduling errors by **70%** and boosting on-time assignments by **30%**.
- Developed an automated Excel-based inventory tracker that reduced tool loss by **40%** and improved inventory accuracy to **98%**.
- Partnered with crews and management to map pain points and refine communication workflows, driving a measurable uptick in operational clarity.

UTSCIM | University of Toronto Supply Chain and Intelligence Management

Project Manager

Toronto, ON

September 2024- Present

- Led the design of a Python-based ML model to forecast supply-chain bottlenecks, trimming lead times by **12%**.
- Organized and led **5** hands-on workshops for **50+** students on applied ML in supply-chain optimization.
- Developed a Tableau dashboard to visualize real-time performance metrics, enabling data-driven decisions.

Noble Corporation

Credit Support Intern

Concord, ON

April 2022 - August 2022

- Automated Excel account allocation flows and verified customer account accuracy
- Analyzed payment trends using Excel and Python because this helped in identifying key trends and patterns, thus enabling the team to make informed decisions.

Projects Projects and Technical Experience

Multi-Output Audio Feature Regression Pipeline | *Audio Preprocessing, Feature Engineering, Regression Modeling*

- Designed a multi-output regression pipeline to quantify 11 musical attributes using a Random Forest baseline (**MSE 83.68**) and a GRU-based RNN (**MSE 3.97**).
- Built an end-to-end audio preprocessing framework: scraped full-length tracks via YouTube, extracted MFCCs, chroma, spectral contrast, tonnetz, and zero-crossing rate with Librosa, and structured inputs for PyTorch.

- Implemented checkpointing on Google Colab GPUs, ran hyperparameter sweeps (hidden sizes **256/512**, **dropout 0.3–0.5**, **learning rates 0.0005–0.001**), and analyzed **per-feature MSE heatmaps** to drive model refinements.

Hospital Simulation Model: Reducing Patient Waiting Times | *Simio, Python, R*

- Developed a discrete-event simulation in Simio to model patient flows through acute (Medicine, Neuro/MSK) and rehabilitation wards, fitting arrival, treatment, and rehab time distributions (Weibull, Lognormal, Gamma, Exponential) via Python.
- Designed experiments (warm-up ~1,230 days; run length 12,300 days) and evaluated **18** prioritization scenarios, finding FCFS outperformed dynamic routing under current capacities.
- Quantified performance: avg. wait times (**Medicine 90.6 days, Neuro/MSK 4.47 days**), ward utilizations (**up to 97.7%**), and blocked-bed proportions (**~50%**), then recommended capacity/routing adjustments.

Project Manager, CRSD Bracelet Design | *University of Toronto, Engineering Strategies & Practices II*

- Led a team of **5** to develop a Conceptual Design Specification for a wearable device measuring circadian rhythm desynchrony via temperature, light exposure, and sweat rate.
- Evaluated **50+** concepts using brainstorming, multi-voting, and Pugh-method matrices; selected an Ergonomic Environment Bracelet (EEB) with IP68 water resistance, long-life batteries (6–12 mo), embedded sensors, and companion app.
- Defined measures of success (**±0.1% sensor accuracy, cost ~\$100 CAD, <30 g, medical-device compliance**) and drafted comprehensive test plans and stakeholder analyses.

Cognitive Safety Literature Review and Research Support | *University of Toronto, Cognitive Safety Research*

- Collaborated with Prof. Mark Chignell on *Improving Cognitive Safety in High-Risk Patients* (2024), contributing to study design, data analysis, and manuscript drafting.
- Conducted a systematic review of **100+** academic papers to identify trends and gaps in cognitive safety practices within healthcare.
- Synthesized findings into actionable recommendations that informed subsequent empirical research and protocol revisions.

Leadership and Community Involvement

Summer Camp Mentor – *St. Paul's Church (Summer 2020)*

- Mentored a group of **15+** children in a summer camp, teaching lessons on faith and moral values in an engaging and age-appropriate way.
- Organized daily activities, including arts, crafts, and team-building games, fostering creativity and collaboration among participants.
- Built strong relationships with campers and parents, receiving positive feedback for creating a supportive and fun environment.

Certifications

Certification: TensorFlow Developer Certificate (2023)

Skills

- Programming Languages:** Python (TensorFlow, scikit-learn, Keras, Pandas, NumPy), Java, C++, R, SQL, MATLAB
- Machine Learning & AI Tools:** TensorFlow, scikit-learn, Keras, OpenCV
- Optimization & Simulation:** Simio, Gurobi, CPLEX, AMPL
- Data Visualization & Analytics:** Tableau, Power BI, SAS, Microsoft Excel (Advanced), Matplotlib
- Web Development:** Flask, HTML, CSS, JavaScript, AppSmith
- Tools & Version Control:** Git, Google Colab, Jupyter, Eclipse/IntelliJ IDEA, VSCode