MATT MACDONALD

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MEng, PEng - *Professional engineer, trained data engineer & scientist, technology enthusiast, tech industry experience.*

EXPERIENCE

Libin Cardiovascular Institute, University of Calgary
Senior Specialist, Data Engineering Sept 2021 - Present

- Architected cloud data lakehouse and data pipeline for medical record data from 400K patients and 10+ sources within Alberta health system for medical researchers. Innovated robust de-identification solutions to protect patient privacy.
- Consulted on predictive modeling research for physicians resulting in multiple academic publications. One such project achieved 95%+ AUC prediction of pacemaker infection post-surgery applying logistic regression to hospital coding data.
- Performed comprehensive data cleaning of messy data sources dating back over a decade. Applied NLP on legacy free text fields.

Baylis Medical
Principal Engineer, R&D Cardiology 2019 - Sept 2021

- Completed early research and development of sensorized surgical catheter for 3D localization, new product line.
- Supervised 5-10 engineers as technical lead from project inception. Filed patents, attended conferences & managed stakeholders.

XOR Labs (now Traferox Technologies)
Senior Engineer, R&D 2016 - 2019

- Developed controller software in C for novel lung transplant organ perfusion machine. Instituted and executed procedures for unit, functional & system testing in real world laboratory and OR environments. Served as interim Director of Engineering.

Pratt & Whitney Canada
Senior Analyst, Control Systems 2014 - 2015

- Developed automated verification analysis tools in Matlab for testing software requirements on aircraft FADEC controllers.
- Analyzed engine logs & real-time sensor data for root cause of bugs encountered in the field. Solved issues deemed unresolvable to customer's delight, such as a faulty thrust reverser deployment bug.

Analyst, Structural Systems 2010 - 2014

- Performed physics-based modeling, mathematical simulations & design optimization using finite element analysis tools for design and fatigue life prediction of fluid tubing systems on aircraft gas turbine engines.

OTHER EXPERIENCE

School of Continuing Studies, University of Toronto
Instructor, Machine Learning (SCS 3253) Fall 2019 - Spring 2022

- Lectured 3 full semesters on ML fundamentals and applications, 80+ students in total. Awarded best new instructor in 2021.
- Curriculum covered supervised/unsupervised learning, feature selection, dimension reduction, SVMs, decision trees, deep learning.

EDUCATION

Fellowship, Insight Data Science Completed 2019

- Developed pipeline for automated anomaly detection on hydraulic plant sensor data. Achieved 15% accuracy improvement over state of the art. Implemented VAE neural network with PyTorch, trained on normal data and deployed for inference on AWS.

Master of Engineering, University of Toronto
Mechanical and Industrial Engineering Completed 2010

- Research position developing campus electricity usage data tools in Matlab for University Sustainability Office.

Bachelor of Applied Science and Engineering, Queen's University
Mechanical and Materials Engineering (Honour's) Completed 2009

SKILLS

Programming	Python (~10 yrs), C, MATLAB, Linux CLI, Git version control, software testing
Data Science	Pandas, Polars, Numpy, Matplotlib, Scikit-learn, PyTorch, Keras/Tensorflow, SQL
Analytical	Data cleaning, supervised modeling, statistical analysis, anomaly detection, time-series
Cloud	AWS (EC2, S3, Redshift, Lambda), dbt (data build tool)