Tyson Mitchell

Data Driven Engineering · MSc, EIT

Experience

Research Council Officer/Data Scientist *Ottawa, Ontario*

Data Analytics Centre – National Research Council Canada, Government of Canada *Oct. 2018 - Present*

- Led research and development contracts for a wide variety of clients at different technology readiness levels.
- Top 2.5% Performer and 'Instant' Award Winner - Fiscal Year 2024.
- Project Examples:
  - Unsupervised learning leveraging autoencoders for image embeddings generation utilizing 30M images. Novel research.
  - Recommender System for nutrition-based phone app powered by engaged users interactions. Increased engagement 20%.
  - Anomaly detection developed for 1000+ unique sensor network in a complex mechanical system using *in-situ* data.
  - Text classification and LLM summaries on invoices of various file formats and page layout. Reduced client API costs by 75%.
  - Image segmentation of GIS-style images for canopy detection. Reduced human effort by 40% per image.
- Contributed to more than $5M in revenue as Technical Lead and/or Project Manager on numerous projects.
- Results delivered to clients as technical reports, REST APIs, source code, and/or docker containers.
- Mentored, guided, and trained junior staff and students through successful projects.
- Committee on Health and Safety: May 2019-May 2024.

Data Scientist *Ottawa, Ontario*

Expenditure Analysis – Treasury Board of Canada Secretariat, Government of Canada *Oct. 2016 - Oct. 2018*

- Executing data procurements and transformations to increase government transparency through numerous projects.
- Results from the above contribute to the GC Infobase website.
- Led Machine Learning research and implementation to predict governmental spending.
- Directing introduction to Python Coding, Machine Learning, and Deep Learning Tutorials.
- Leader and organizer of a monthly technical seminar series and key participating member of Data Science cloud infrastructure pilots.

Field Application Engineer *Ottawa, Ontario*

Westboro Photonics *Jan. 2016 - Sept. 2016*

- Details upon request.

Technical Skills

Programming:	Python: 30k lines+; Matlab & Java: 5k lines+; C, R, SQL & Bash: 2k lines+; Docker: Exposure.
Python Stack:	Numpy, Pandas, Scikit-Learn, OpenCV, Scikit-Image, Pytorch, Tensorflow, Nltk, SpaCy, Matplotlib, Plotly/Dash.
Data Science:	Machine Learning, Neural Networks, Deep Learning, Natural Language Processing, Machine Vision.
Math/Stats:	Information Theory, Stochastic Systems, Frequency Analysis, Inference, Control.

Education

Master of Science, Applied Mathematics *Kingston, Ontario*

Queen's University *Jun. 2015*

Bachelor of Engineering and Applied Science, Mathematics and Engineering *Kingston, Ontario*

Queen's University *Jun. 2013*

Honours & Awards

2024	**Merit Promotion: Top 2.5% Performer**, National Research Council - Promotion Review Board	*Ottawa, Ontario*
2023	**"Instant" Award Winner**, National Research Council	*Ottawa, Ontario*
2020	**Go to Market Product Award**, National Research Council - Digital Technologies Awards.	*Ottawa, Ontario*
2018	**"Instant" Award Winner**, Treasury Board of Canada Secretariat	*Ottawa, Ontario*
2013	**Keyser Prize Winner**, outstanding undergraduate thesis, Queen's University.	*Kingston, Ontario*
2013	**Dean's Scholar**, outstanding academic achievement, Queen's University.	*Kingston, Ontario*

Presentations

Latent Representations for Hydrometeor Image Clustering *Virtual*

Federal Data Science Hub Sessions *April 2024*

- On the use of deep autoencoders for image feature extraction and hierarchical clustering.

Vessel Health Monitoring Workshop with Royal Canadian Navy *St. Lauren, Quebec*

Methodology and Results Showcase *March 2019*

- On the use of Piecewise Linear Approximations for Anomaly Detection and Early Detection of System and Sub-system Failures.

Society for Information Display (SID): Display Week 2016 *San Francisco, California*

Exhibitors' Forum: OLEDs and Quantum Dots (Session 3) *May 2016*

- High Resolution, High Accuracy, Display Measurements using the WP690SF Combination Imaging Colorimeter and Spectroradiometer.

Publications

[1] **B. Spencer, B. Khaddaj, S. Luong, T. Mitchell and Z. Erdenebaatar**, "PECAN: Pipeline for Auto-Encoder and Causal Analysis for the Royal Canadian Navy," NATO Operations Research and Analysis Conference, Oct. 2022.

[2] **T. Mitchell, M. Fee, J.D. Caron and B. Khaddaj**, "On the use of the Integrated Platform Management System (IPMS) data to develop predictive models," Defence Research and Development Canada Scientific Letter, DRDC-RDDC-2019-L124, May 2019.

[3] **T. Mitchell, F. Alajaji and T. Linder**, "Binary Signaling of Correlated Sources over Orthogonal Multiple Access Channels," IEEE Wireless Communications Letters, Vol. 4, No. 5, pp. 501-504, Oct. 2015.