THOMAS FORTIN

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# TECHNICAL SKILLS SUMMARY

Python: {PyTorch, Tensorflow, Pandas, Numpy, Scikit-Learn, SciPy} |5 years

Machine Learning: NLP, Transformers, CNN, LSTM, {Classical Methods, Supervised Learning, Unsupervised Learning, Clustering} |4 years

Other languages and technologies: Docker {C#, C++, Java, Linux, REST API, AWS, SQL, MATLAB}

# PROJECTS

## Compute Optimal Training for Biosignal Transformers

MASc Thesis | May 2023 – Apr 2024

* Developed a scaling law to predict the optimal balance of training tokens vs model size for a Biosignal Transformer given a fixed compute budget resulting in better performance for smaller compute budgets.
* Implemented maximal update parameterization (MuP) for the Biosignal Transformer (BIOT) architecture to allow for hyperparameter transfer across various model sizes during testing using Python (PyTorch).
* Identified appropriate datasets, applied preprocessing, and designed an optimal storage solution to minimize memory usage and significantly reduce data loading time during training using Python (NumPy, Pandas) and Linux

## Automated Medical Imaging Report Filling with NLP

Capstone Design Project | Sep 2021 – Apr 2022

* Designed a system which tags scans of medical imaging reports with pertinent labels such as patient name, body part, and imaging modality in order to relieve physician documentation burden.
* Developed a process to integrate data from multiple sources into useful training data for the project in order to increase training set size from 20 samples to 1000s of samples and avoid use of private health information using Python (Pandas, NumPy).
* Developed, trained, and tested a BERT model for a report classification task using Python (PyTorch), AWS SageMaker, and Linux.

# EXPERIENCE

## University of Waterloo + Smile Digital Health

MASc Student + Industry Partner | May 2022 – May 2024

* Developed, trained, and tested classical ML models to improve the record linkage algorithms used by Smile Digital Health resulting in a prototype that will decrease overhead and increase accuracy for clients using Python (scikit-learn).
* Effectively communicated complex machine learning concepts, algorithms, and project progress to both internal teams and external clients, facilitating seamless understanding and collaboration between technical and non-technical stakeholders.

## University of Waterloo (Faculty of Engineering)

Teaching Assistant (Circuits Lab, Systems Modelling) | Sep 2022 – Apr 2024

* Taught complex course concepts to engineering students with varying levels of expertise, honing the ability to support students in their academic growth both individually and in a group setting.

## NuraLogix

Data Science Software Developer (Co-op) | May 2021 – Aug 2021

* Developed, trained, and tested CNNs to predict blood pressure readings from videos of users' faces using Python (PyTorch, scikit-learn).
* Developed and tested a new method for video pre-processing which resulted in a significant increase in regression accuracy using OpenCV.

## Altis Labs

Data Scientist (Co-op) | Jan 2021 – Apr 2021

* Trained and tested CNNs to predict survival probability for lung cancer patients based on chest CT-scans using Python (PyTorch, Pandas) and AWS SageMaker.
* Created an internal tool for automating testing of new models resulting in a significant increase in efficiency for the team’s machine learning workflow.

## IntelliSports

Machine Learning Developer (Co-op) | Apr 2020 – Sep 2020

* Developed, trained, and tested RNNs and CNNs for human activity recognition (HAR) using Python (TensorFlow, Keras, scikit-learn).
* Implemented and optimized solution on production servers using Python, REST API, and Linux.

# EDUCATION

Master of Applied Science, Systems Design Engineering University of Waterloo / May 2024

Bachelor of Applied Science, Biomedical Engineering University of Waterloo / Apr 2022

# AWARDS AND ACKNOWLEDGEMENTS

Engineering Excellence Fellowship / 2022-2024

Dean’s Entrance Award / 2022

University of Waterloo President’s Scholarship of Distinction / 2017-2018

Faculty of Engineering Entrance Scholarship / 2017-2018