Collin A. Joseph

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Summary

- Substantial knowledge of **machine learning** and **digital signal processing** from work and research.
- Substantial knowledge of **optimization** and **algorithm design** from research and coursework.
- Proficient in **Python** and **C++**, with experience using **Tensorflow**, **Keras** and **scikit-learn**.
- Proficient in **Matlab** from work and research.

Education

Coursera **Online**
Deep Learning Specialization *Sept. 2019*
- A 5-course specialization by deeplearning.ai on Coursera.
- Completed **Python**-based assignments using **Tensorflow** and **Keras** to implement deep learning architectures.
- Relevant Coursework: Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models

McGill University **Montreal, Quebec, Canada**
Masters of Engineering in Electrical Engineering (with thesis) *2017–2019*
- Graduation Date: 29th October 2019
- Relevant Coursework: Applied Machine Learning, Optimization, Generalized Linear Models

University of Waterloo **Waterloo, Ontario, Canada**
Bachelor of Applied Science in Electrical Engineering (with co-op) *2012–2017*
- Graduated with distinction.
- Relevant Coursework: Adaptive & Cooperative Algorithms, Algorithm Design & Analysis, Digital Signal Processing

Research Experience

McGill University **Montreal, Quebec, Canada**
Master's Thesis *2017–2019*

Research was focused on statistical analysis, signal processing and development of **machine learning** algorithms for microwave radar breast cancer screening system with McGill RF Breast Cancer Screening Group.

- Implemented **ensemble cost-sensitive SVM** classifier for microwave radar scans using **Python**.
- Reduced ensemble training time using genetic algorithms, particle swarm optimization and simulated annealing.
- Improved predictive performance by proposing new time-frequency decomposition features.

Technology Used: Python (scikit-learn, matplotlib), Matlab, Git, Linux

Work Experience

wrnch AI **Montreal, Quebec, Canada**
Developer, Production Team *Nov. '19 – Mar. '20*
- Expanded functionality of **computer vision** inference server using **C++**.
- Automated data pre-processing pipeline and model benchmarking using **Python**.
- Collected and curated data to improve **computer vision** model performance.

Technology Used: C++, Python, OpenCV, Git, Linux

ON Semiconductor **Waterloo, Ontario, Canada**
Signal Processing Algorithm Developer (co-op) *Sept.'16 – Dec.'16*

- Prototyped an environmental classification algorithm for low-resource digital hearing-aids.
- Optimized an acoustic noise reduction algorithm extensively, improving (decreasing) power consumption by 20%.
- Leveraged fixed point arithmetic operations to maximize algorithm efficiency.

Technology Used: Matlab, Assembly Language, Jira, CVS version control

ON Semiconductor **Waterloo, Ontario, Canada**
Signal Processing Algorithm Developer (co-op) *Jan.'16 – Apr.16'*

- Developed a digital equalizer firmware module in assembly language.
- Simulated and performed experimental analysis on digital equalizer using Matlab.
- Executed and documented extensive test procedures for acoustic feedback cancellation algorithm.
- Documented and presented analysis and test results to firmware and software development team.

Technology Used: Matlab, Assembly Language, Jira, CVS version control

ON Semiconductor **Waterloo, Ontario, Canada**
Signal Processing Algorithm Developer (co-op) *May'15 – Aug.'15*

- Evaluated performance of an static noise reduction algorithms using Matlab.
- Developed functional simulations to evaluate performance of various digital signal processing algorithm configurations.
- Performed experimental analysis on multiple noise estimation methods for enhancement of noise reduction algorithm.
- Developed and executed automated acoustic tests for directional noise reduction algorithm using Matlab & C.

Technology Used: Matlab, Assembly Language, C, Jira, CVS version control

University of Waterloo **Waterloo, Ontario, Canada**
Research Assistant, (4 months full-time, 4 months part-time) *Jan'14–Aug.'14*

- Developed and evaluated a ray tracing simulation tool for radio wave propagation using C++ and Matlab.
- Reduced runtime by over 60% using CUDA parallel computing platform on Nvidia GPU hardware.
- Designed an electromagnetic simulation GUI using Matlab.

Technology Used: C++, Matlab, Windows

Volunteer Experience

Couple Six Inc. **Bridgetown, Barbabdos**
Developer *Jan.'15 – Jul.'15*

- Collaboratively developed adventure game prototype using Unity game engine and C# scripting.
- Coordinated development remotely with project team using Git version control.

Technology Used: C#, Unity, Git, Windows

Awards

Faculty of Engineering, University of Waterloo **Waterloo, Ontario, Canada**
Sandford Fleming Foundation Award, Co-op Proficiency *Jul.'17*
For outstanding performance during co-op work terms.

Faculty of Engineering, University of Waterloo **Waterloo, Ontario, Canada**
Sandford Fleming Foundation Award, Work Report Proficiency *Jul.'16*
For excellence in written communication.

Hobbies & Interests

- Interest in video game design and development
- Athletics and martial arts enthusiast.