

# Collin A. Joseph

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## Summary

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

## Education

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### Coursera

*Deep Learning Specialization*

Online

Sept. 2019

- 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

*Masters of Engineering in Electrical Engineering (with thesis)*

Montreal, Quebec, Canada

2017–2019

- Graduation Date: 29th October 2019
- Relevant Coursework: Applied Machine Learning, Optimization, Generalized Linear Models

### University of Waterloo

*Bachelor of Applied Science in Electrical Engineering (with co-op)*

Waterloo, Ontario, Canada

2012–2017

- Graduated with distinction.
- Relevant Coursework: Adaptive & Cooperative Algorithms, Algorithm Design & Analysis, Digital Signal Processing

## Research Experience

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### McGill University

*Master's Thesis*

Montreal, Quebec, Canada

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

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### wrnch AI

*Developer, Production Team*

Montreal, Quebec, Canada

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

*Signal Processing Algorithm Developer (co-op)*

Waterloo, Ontario, Canada

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

Teaching Assistant, Fundamentals of Programming

Sep.'14–Dec.'14

- Tutored engineering students in C# programming fundamentals.
- Presented course content to students on an individual basis and in classes of up to 100.
- Consistently completed administrative tasks ahead of deadlines.
- Cooperated effectively with teaching team of 18 members to ensure smooth running of the course.

**Technology Used:** C#, Windows

## 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.