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BEng. MASc.

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Current Employment

2018-Present | **Biomedical Machine Learning and Data Science Specialist - FULL-TIME**
Cerebral Diagnostics Canada Inc.

- Develop the patent pending main algorithm of the company to detect predisposition of Fibromyalgia using machine learning and advanced signal processing techniques
- Research, develop and evaluate new analytic tools for data mining, statistical analysis, and machine learning models for other central sensitization disorders
- Develop data visualizations and perform data wrangling to present data in an accessible way that allows anyone to gain insights without having prior knowledge of the subject
- Develop technical drawings and memos to communicate algorithms to a wide variety of academic and non-academic audiences
- Develop and perform clinical data acquisition of patients for various studies
- Create proposals for various grants and ethic boards and ensure they have a high chance of being successfully accepted

python | MATLAB | Java | Visual Basics | C++ | webGL | openGL | plotly | SQL | LaTeX | Java Script

2016-Present | **Chief Technology Officer - PART-TIME**
Headache Sciences Inc.

- Develop the patent pending main algorithm of the company to detect predisposition of migraines using machine learning and advanced signal processing techniques
- Research, implement and evaluate analytical tools and machine learning models for other headache disorders
- Build tools and metrics to monitor and analyze model performance and data accuracy
- Present research and insights to stakeholders, partners, and investors using various data visualization tools such as Plotly, matplotlib, seaborn and three.js and other data wrangling techniques
- Perform clinical data acquisition of patients for various pilot studies
- Manage a team to perform market research and identify medical regulation requirements as well as venues of commercialization of the product
- Create proposals for various grants and ethic boards and ensure they have a high chance of being successfully accepted

python | MATLAB | plotly | SQL | LaTeX | Java Script

Previous Employment

2018-2020 | **Graduate Research Assistant - PART-TIME**
OCAD University PHASE Lab

- Develop algorithms to perform automatic and semi-automatic segmentation from various medical imaging technologies, using marching cube, histogram manipulation, seed based approaches, morphological filters and U-Net deep learning architecture
- Develop and implement a pipeline to generate image ready frame stacks for medical holography from segmented MRI data of rat, monkey, and human brain
- Work with University Health Network to develop segmentation of OCT vascular data for 3D medical holographic visualization

python | Java Script | plotly | Blender | MeshLab | LaTeX

2015-2019 | **Data Scientist - PART-TIME**
Dementia Health

- Develop analytical tools to identify abnormalities in the EEG of Alzheimer's subjects to autonomously differentiate them from a normative group
- Develop novel signal processing techniques to perform feature analysis, reduction and fusion. Modify and identify appropriate existing machine learning techniques to perform pattern classification
- Perform clinical data acquisition of patients for various pilot studies. Create proposals for various grants and ethic boards which were successfully accepted

python | MATLAB | C++ | C | LaTeX | PostgreSQL

2015-2018 | **Biomedical Research Engineer - FULL-TIME**
Cerebral Diagnostics Canada Inc.

- Established a new protocol for visual and laser evoked potentials analysis for pain using EEG and source localization.
- Enhancing proficiency and performance of existing proprietary programs by optimizing code and merging programs
- Programming proprietary robotic arm to test and measure thresholds of pain as it relates to diabetic neuropathy and carpal tunnel syndrome
- Develop a new cap system for easy recording of EEG signals. Developed brain sonification techniques
- Develop pipeline, analysis and program to transform existing brain imaging techniques into holographic print ready images

python | MATLAB | C++ | C | LaTeX

2015-2016 | **Consultant Programmer - PART-TIME**
University Health Network

- Developed mobile apps for android and OS, as well as various web applications
- These included creating a medical adherence app in which patient adherence were tracked and automatic reports were sent to doctors

HTML | CSS | PhoneGap | Java Script

2011-2015 | **Junior Biomedical Research Engineer and Programmer - PART-TIME**
Cerebral Diagnostics Canada Inc.

- Develop various novel analytical tools to characterize and classify a variety of neurological processes
- Created novel K-complex, alpha and delta analysis for sleep medicine using EEG source localization
- Lead a group of mathematicians at the Fields Institute to develop a novel brain synchronization technique to identify brain region connectivity

MATLAB | Java | Visual Basics

2011-2012 | **Instructor - PART-TIME**
Real Programming 4 Kids

- Taught children ages 7-15 about the fundamentals and good programming practices of computer programming using C++, C#, Java and Visual Basics
- Help students develop computer games based on the knowledge gained in the course
- Communicated effectively by using simple and clear terminology to explain complex terms

C++ | C# | Visual Basics | Java

2011-2012 | **Research Assistant - PART-TIME**
Ryerson University

- Used C to acquire data from a device called the i1 pro to obtain colour information of a given colour bar
- Analyzed raw spectrum of colour bar and successfully classified individual colours within a colour bar
- Used C++ to create a graphical user interface(GUI) for pressman operators to maintain standard consistent colours within a printing job based on expected colour bar information and acquired colour bar information
- The GUI communicated to a local and web server via SQL lite, to monitor the progression of a printing job.

C++ | C | Java

2010-2012 | **Graduate Research Assistant - FULL-TIME**
Ryerson Signal Analysis Research Group

- Used MATLAB to analyze spectrum and power densities of various EEG signals. Researched and developed algorithms to efficiently perform analysis
- Used intelligent system classification techniques to group similar EEG signals. Developed a GUI in C# and MATLAB to perform different algorithms on EEG signals
- Presented work and findings in weekly conference meetings

MATLAB | C# | LaTeX

Education

2013 - 2015 **Master of Applied Science in Electrical and Computer Engineering**, Ryerson University,Toronto, Ontario
2007 - 2011 **Bachelor in Electrical and Computer Engineering**, Ryerson University,Toronto, Ontario

Certification

2016 **Independent Ethics Committee - Responsible Conduct of Research**, Collaborative Institutional Training Initiative, University of Miami

Awards

2016 **Won Stages 1, 2 and 3 of the Norman Esch Award for Engineering Innovation and Entrepreneurship**
2015 **Awarded 1 of 5 Ontario Brain Institute Interns in the Province**
2013 **Awarded Best Project in the 2013 International Conference for Up-Coming Engineers**

Technical and Personal Skills

Programming Languages C | C++ | C# | VBA | Python | MATLAB | Arduino | TeX | Java Script | Java | HTML | SQL | CSS

Frameworks and Libraries Numpy | SciPy | Pandas | Keras | SKLearn | TensorFlow | Matplotlib | Seaborn | Plotly | Dash | Django | Flask | Jekyll | BeautifulSoup | Eli5 | Angular | React | Node | webGL | openGL

General Business Skills Excellent verbal and written skills. Self-motivated and punctual. Good presentation skills. Works well in a team. Fast learner and quick problem solver with high attention to detail.

Others Can write well organized and structured reports, memos, grant and ethic proposals, and patent submissions.

Publication and Patents

Conferences

- **A Medical Visualization Framework and Pipeline for Holographic MRI**, The International Society for Optics and Photonics 2020
- **Advances in the Direction Towards an Objective EEG Test for Migraine : A Data Driven Approach for Subtyping Classification of Migraine**, CEPHALALGIA. Vol. 39., ENGLAND : SAGE PUBLICATIONS LTD, 2019
- **Discriminative Analysis of Migraine with Aura using Non-Linear Support Vector Classification**, CEPHALALGIA. Vol. 37., ENGLAND : SAGE PUBLICATIONS LTD, 2017
- **A Non-Linear Support Vector Machine Approach to Testing for Migraine With Aura Using Electroencephalography**, Computational Science and Computational Intelligence, 2017 International Conference on. IEEE, 2017
- **The Novel Application of eLORETA for analysis of Delta Sleep in Humans : Implications for Research**, 10th Annual Congress of The Society for Brain Mapping and Therapeutics 2012

Patents

- **Diagnosis of Migraine Via Expert System**, US20180242919A1
- **Diagnosis of Pain Via Expert System**, CDC-028592 US PRO

Thesis & Book

- **Audio Display And Environmental Sound Analysis Of Diagnostic And Therapeutic Respiratory Sounds**, Ryerson University
- **Atlas of the Electrical Generators of Sleep - Content Contributor**, Xlibris Corporation eBook

Langues

- **English** - Fluent
- **Tagalong** - Native Speaker
- **Illocano** - Native Speaker

Interests

- I frequently participate in machine learning algorithm competitions in order to reinforce my existing knowledge in the area of data analysis and pattern classification, while also learning new algorithms and ways to make them more efficient.
- I am an avid runner, competing in various road and trail races in Toronto.

References

Available on request