Ryan Divigalpitiya

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About Me

I am a Computer Science Master's student specializing in artificial intelligence. My research focuses on **Large Language Models (LLMs),** where my task is to develop interpretability techniques to assess how LLMs capture the meaning of words from highly unique vocabularies, such as slang and jargon found on social media and industry-specific terms found in various industries.

I have co-founded two startups, one of which is a successful company. For my second startup, I built a prototype energy management system powered by a **convolutional neural network** that could reduce the energy consumption of a home by 50%. I thoroughly enjoy solving real-world, industry-related problems, as my extensive startup history demonstrates.

During my time interning at Vector Institute, I helped coordinate a complex AI project involving engineering teams from 6 financial institutions: BMO, CIBC, Scotiabank, TD, RBC, and Manulife. I gained a multitude of experience working with a diverse team of stakeholders, ranging from ML Engineers to Project Managers and Directors.

- Master of Science Student, **Computer Science**
  Specialization in Artificial Intelligence, Vector Institute Accredited.
  Western University, London, Ontario. *Expected Graduation: Sep 2023*
- Post-Graduate Diploma, **Computer Science**
  Western University, London, Ontario. *Graduated, June 2020*
- Bachelor of Science, **Medical Biophysics**
  Western University, London, Ontario. *Graduated, June 2013*

{ } Software Languages, Tools, & Skills

6 Years Experience with:

Python | SQL | MATLAB

Git Version Control | Java | C++

2 Years Experience with:

PyTorch | Keras | TensorFlow

Sci-Kit Learn | Pandas | Numpy

Python A.I. & Data Science Libraries:

Tools & Other Environments:

Terminal | MacOS | Windows | Linux | Hadoop

Agile Development | Microsoft Office | Confluence

Slack | Zoom & Microsoft Teams | Photoshop

Soft Skills:

Excellent Communication + Presentation Skills

Outstanding Self-Sufficiency + Time Management Skills

Ability to Adapt and Learn Quickly

Highlighted Projects

- **MSc Research: Large Language Models and their Ability to Capture Meaning in Unique Vocabularies**
  Social media users tend to utilize memes and slang which constantly evolve as internet culture shifts over time. I've been tasked to develop techniques that explore how well LLMs are capturing the meaning of such unique words found in these unique vocabularies. **Link: www.ryan-div.com/MSc-Research**
- **Startup: Building Convolutional Neural Networks to Power Occupancy Detectors for a Smart Home**
  For my second startup, I built a convolutional neural network paired with thermal sensors that were then used to detect room occupancy in a smart-home. **My early prototype achieved 99% accuracy** in discriminating between false-positive and true-positive signals. **Link: www.ryan-div.com/nexus**
- **Computer Science: CS 2212 Introduction to Software Engineering's Final Project**
  In collaboration with Fitbit© and Western University, I led a team of 8 students to build a Fitbit© desktop application that could help users achieve a weight loss goal. I was **back-end developer** and **project manager**. **My team won 1st place for best app in our class. Link: www.ryan-div.com/CS-2212**

Work Experience

May 2021 — Jan 2022

AI Project Management Internship

Vector Institute, Industry Innovation Team. Toronto, Ontario

- **Co-ordinated and oversaw a complex AI project that was a collaboration between the engineering teams of 6 Canadian financial institutions: BMO, CIBC, Scotiabank, TD, RBC, and Manulife.** The project consisted of building a prototype machine learning model that could flag suspicious transactions and would be cross-trained on the datasets of each bank. My responsibilities included devising weekly and monthly goals for the engineering teams of each bank along with overseeing the progress of each team.
- Co-ordinated with the engineering team and management team of Vector Institute in helping to design a bootcamp that taught machine learning-based privacy enhancing techniques. **Oversaw the successful delivery of the bootcamp to 16 medium and large-sized tech-based companies that were sponsors of Vector Institute. We received overwhelmingly positive feedback from all companies.**

Jan 2021 — April 2021

Graduate Teaching Assistant | CS 3340 Advanced Algorithms & Data Structures

Department of Computer Science, Western University, London, Ontario

- Taught students various topics covered in the course: Recursion, Search, Sorting, & Graph Algorithms, in addition to other topics.

2018 — 2020

Founded Startup, CEO & Lead Engineer

Nexus Labs (www.ryan-div.com/vector-app/nexus)

- After 4 years at Perpetually Innovative Developments (PID), I founded another startup, Nexus Labs, which worked closely with PID.
- Working with my own three-person team at Nexus Labs, **we engineered a prototype smart home system that could reduce energy consumption of a home by 50%**. Our system involved custom-built sensor arrays that could sense occupancy in a room: the arrays were powered by a convolutional neural network that could discriminate between a thermal image of a person versus a thermal image of a false-positive heat source. **A video of me presenting the design of the prototype can be found at**: www.ryan-div.com/vector-app/nexus

2014 — 2018

Co-Founded Startup, Chief Technology Officer

Perpetually Innovative Developments, London ON. (www.ryan-div.com/vector-app/pihomes)

- One of two co-founders responsible for initial set up of operations and logistics of the company.
- **We sold over 2.5 million dollars in homes during my time there.** Our last project I worked on before I left the company, (the Model One - viewable in the link above), set a new standard in energy-efficiency for residential homes, **delivering over 75% energy savings.**

2013 — 2014

Physicist Researcher

3M Canada Inc., London ON

- Worked in a three-person research team that developed graphene-based functional materials and their synthesis methods in an R&D setting.
- **Co-authored 4 invention submissions during my 16 months at 3M Canada.**
- Record of Invention Numbers: NO48716, NO48752, NO49242, NO51476.

2012 — 2014

Biophysicist Researcher (Part-Time)

Gerald C. Baines Centre for Translational Cancer Research Centre, Victoria Hospital, London ON

- Used various machine learning techniques to determine which treatments would result in the largest reduction in brain tumour size.
- Developed 3D image analysis software for patient MRI/CT image data of metastatic brain tumours. Algorithms were developed in MATLAB.
- Collaborated with onsite oncologists, radiologists and patient subjects in real-time in order to rapidly prototype our predictive models.

Awards

March 2017

Won 1st place in section and in overall

Industry Problem Solving Week (IPSW) 2017 (http://ipsw.uwo.ca), Western University, London Ontario

- I led my team to compete and win in IPSW 2017, a competition held by Western University in collaboration with local industry partners.
- My team and I developed a plan to use IBM Cloud's AI technologies to reduce hospital inefficiencies and **won 1st place in all sections.**

April 2016

Won 1st place for best app in class

Computer Science 2212A - Introduction to Software Engineering, Western University, London Ontario (www.ryan-div.com/CS-2212)

- Led a team of 8 students to build a Fitbit desktop application. I was the Project Manager, Back-End Developer, and UI/UX Designer.
- My team and I utilized Agile Methodology to build our application in Java. **We won 1st place for best app in our class.**

References Available Upon Request