Vishnu Akundi

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Education

University of Toronto **Toronto, ON**

BASc. Engineering Science (Machine Intelligence Specialization) + PEY Co-op *September 2019 - April 2024*

- CGPA: 3.7/4.0
- **Relevant Coursework:** Probabilistic Reasoning, Machine Intelligence and Neural Networks, Artificial Intelligence, Introduction to Databases, Systems Software, Data Structures and Algorithms (C), Matrix Algebra and Optimization, Digital and Computer Systems (ARM Assembly and Verilog), Ordinary Differential Equations.
- **Additional Coursework (Coursera):** Deep Learning Specialization, GAN Specialization, NLP Specialization

Experience

Royal Bank of Canada Capital Markets (RBC CM) **Toronto, ON**

Artificial Intelligence Engineer (PEY Co-op) *May 2022 - September 2023*

- Developed and deployed time series models such as RNN's, LSTM's, and HMM's to model financial markets and improve existing **Reinforcement Learning** (RL) based trading algorithms through **Market Regime Analysis**.
- Researched and tested different **reward systems** for RBC's Reinforcement Learning trading algorithm.
- Spearheaded **Momentum Return** prediction model that led to an **improvement of 25%** in VWAP Slippage.
- Created pipeline that allows developers to efficiently test their new models on the existing RL trading algorithm.
- Conducted analysis and generated reports on how new algorithms are performing in the market.
- **Technologies used: Python, NumPy, KDB, Pytorch, SciPy, Hydra.**

Kundur Lab & Centre for Addiction and Mental Health (CAMH) **Toronto, ON**

Undergraduate Researcher *May 2023 - Present*

- Worked with CAMH researchers to use Time Series **(HMM, ARIMA)** and Vanilla networks to predict a patient's risk of relapsing into depression given medical surveys.
- **Technologies used: Python, NumPy, Pytorch, SciPy, Pandas.**

Machine Learning and Computational Healthcare Lab **Toronto, ON**

Undergraduate Researcher *August 2021 - May 2022*

- Theorized and developed algorithms for identifying **Distribution Shifts** that harm the performance of modern ML methods in deployment using the principles of **Causal and Variational Inference**.
- **Technologies used: Python, NumPy, Tensorflow, Pytorch, SciPy.**

Meyer Lab **Toronto, ON**

Undergraduate Researcher *May 2021 - August 2021*

- Performed **3D Vector Analysis** using **OpenCV** to diagnose Ulcerative Colitis in underrepresented communities.
- **Modeled Requirements** and **Optimized** object tracking algorithms by **improving model consistency by 29%**.
- **Technologies used: Python, OpenCV, NumPy, SciPy, MATLAB, Tensorflow.**

Data Science Toronto **Toronto, ON**

Projects Lead *July 2020 - May 2022*

- Developed a Neural Network to predict a patient's risk of Acute Kidney Injury with **89% sensitivity**.
- Helped develop a Machine Learning algorithm using **Random Forest** to predict Greater Toronto Area housing prices.
- Developed an algorithm that uses Short-time Fourier Transform, **RNN**'s, **CNN**'s, and **MFCC** to deconstruct audio signals.
- **Technologies used: Python, MATLAB, python_speech_features, MFCC, SciPy, Pandas, Random Forest, Tensorflow.**

Technical Skills

Programming: Python, Java, C, KDB+/Q, MATLAB, HTML/CSS, JS, SQL, Verilog, ARM Assembly, OpenCV, NumPy, Data Structures, Pandas, OOP, Data Science, Neural Networks, Tensorflow, Pytorch, NLP, GAN's, Variational Autoencoders, Computer Vision, Time Series Analysis, Reinforcement Learning, Reward Design, Web-Scraping.
Design Principles: Requirement Modeling, Framing, Stakeholder Analysis, Simulation, Optimization, Objective Value Functions, Decision Tree Analysis

Awards

Awards: Dean's Honor List, AI4Good Hackathon Winner in the "Data in the Criminal Justice System" category, Engineering Science Research Opportunities Program Award, Faculty of Applied Sciences Admission Scholarship