MARTIN MA

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Internships

Software Engineering Intern
AstraZeneca

June 2022 - Aug 2022 Gaithersburg, US

- **[Patent pending]** Developed a **real-time locating system** (RTLS) prototype to track equipment positions using ultra-wideband (UWB) and integrated with autonomous mobile robots (AMR), in **Arduino C++** and **Python**.
- Implemented a **neural support vector machine** (NSVM) to achieve 78% accuracy in classifying clinical trial properties of monoclonal antibody, using **scikit-learn**.

Machine Learning Intern
Wireless Sensors and Devices Lab - University of Waterloo

Sept 2020 - Dec 2020 Waterloo, Canada

- Developed a **convolutional LSTM** to detect vehicle passengers using multi-input multi-output (MIMO) frequency modulated continuous wave (FMCW) radar, improved accuracy by 20% compared to the previous method, using **Pytorch**.

Machine Learning Intern
Autonomous Vehicle Lab - University of Waterloo

May 2020 - Aug 2020 Waterloo, Canada

- Implemented an active learning framework for LiDAR-based **3D object detection** and improved sample efficiency by 5% through designing uncertainty-based acquisition functions, in **Python**.
- Characterized epistemic and aleatoric uncertainty using **Monte Carlo dropout** and minimized expected calibration error by calibrating network output using temperature scaling, with **Pytorch** and **CUDA**.

Data Analyst Intern
Suncor Energy

Sept 2019 - Dec 2019 Calgary, Canada

- Reduced unreachable underground oil field temperature prediction error by 30% through constructing a **physics-based neural network**, this led to 1.3 million $ annual benefit, using **scikit-learn**.

Awards & Honours

- Full scholarship to MIT through departmental fellowship (2021)
- First-in-class Scholarship (2019, 2020)
- Engineering Faculty Upper Year Scholarship (2019)
- President's Scholarship (2017)

Publications

- **On the Use of Machine Learning and Deep Learning for Radar-Based Passenger Monitoring**
  Hajar Abedi, Martin Ma, Jennifer Yu, James He, Ahmad Ansariyan, George Shaker
  IEEE - AP-S/URSI, 2022

Education

Harvard University
MS - Computational Science and Engineering

2022/09 - 2024/05 Cambridge, USA

- **Relevant Courses**: Stochastic Methods for Data Analysis, Database Systems, Financial Engineering

Massachusetts Institute of Technology
MS - Chemical Engineering

2021/09 - 2022/08 Cambridge, USA

- Cumulative GPA: 5.0 / 5.0
- **Relevant Courses**: Deep Learning, Dynamic Programming & Reinforcement Learning, System Engineering, Numerical Methods

University of Waterloo
BASc - Chemical Engineering

2016/09 - 2021/06 Waterloo, Canada

- Cumulative GPA: 95%
- Option (similar to Minor) in Artificial Intelligence
- **Relevant Courses**: Machine Learning, Optimization, Algorithms & Data Structures, Data Mining, Game Theory.

Technical Skills

Languages
Python C++ Java SQL

Tools
Docker CPLEX ROS MATLAB

ML Libraries
scikit-learn Pytorch Tensorflow Keras Captum

Projects

- Reinforcement Learning Methods for Pricing American-Style Options
- Robust Shortest Path with Stochastic Arc Lengths
- Tetris.ai - github.com/martinzwm/tetris-ai