Martin (Ziwen) Ma

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Education

University of Waterloo — University of Waterloo
BASc Chemical Engineering — Sept 2016 - Apr 2021

- Cumulative GPA: 95%, Rank: 1/50, Dean's Honours List
- Double options in Artificial Intelligence and Management Sciences, Specialization in Process Modelling, Optimization & Control

Awards & Honours

Vice President of Chemical Engineering Student Society (2018-present)
First-in-class Scholarship (2019, 2020)
Engineering Upper year Faculty Scholarship (2019)
President's Scholarship (2017)

Research Internship

University of Waterloo - Professor Krzysztof Czarnecki — Waterloo, Canada
Autonomous Vehicle Engineer — June 2020 - Aug 2020

- Enhanced model robustness and increased performance by 5% through implementing state-of-the-art uncertainty estimation methods in 3D LiDAR object detection neural networks, using Python and PyTorch.
- Developed a visualization tool for users to easily interpret the 3D object detection results and gain confidence in model output, using Captum.

IPEX - Dr. Louis Daigneault — Mississauga, Canada
R&D Engineer — Sept 2017 - Dec 2017

- Composed a new formulation and enhanced smoke resistivity by 30% while maintaining other physical properties through conducting a Design-of-Experiment (DOE).
- Scaled up the proposed formulation in plant-scale trial and troubleshot rheology difficulties.

University of Waterloo - Professor Boxin Zhao — Waterloo, Canada
Research Assistant — Jan 2017 - April 2017

- Improved Electrically Conductive Adhesive (ECA) formulation to achieve 15% increase in conductivity compared to current commercialized products, while maintaining viscosity, mechanical strength, adhesiveness and curing profile.
- Performed Ultraviolet-Ozone surface treatments on various substrates and stencil printed ECA on flexible and stretchable materials.

Industrial Internship

Suncor Energy — Calgary, Canada
Production Engineer — Sept 2019 - Dec 2019

- Reduced the unreachable underground oil field temperature prediction error by 60% through constructing a deep learning network with PyTorch.
- Enabled refinery system malfunction alert 1-3 days in advance with 83% precision using an autoencoder for anomaly detection with Keras.
- Automated tasks of calculating oil sample saturation level from lab pictures, with normalization for different lighting conditions with OpenCV.

Petro-Canada Lubricants — Mississauga, Canada
Process Engineer — Jan 2019 - Apr 2019

- Reduced power consumption by 12% through optimizing parameters in the operating function of the dewaxing unit compressor's anti-surge controller.
- Improved heat exchanger reliability and forecasted degree of fouling by automating heat coefficient calculations through transmitter data and energy balance.

- Performed unit monitoring on critical process parameters in the hydrotreating units, dewaxing unit, H_2 plant, and Sulphur plant.

SABIC Cobourg, Canada
Manufacturing Engineer May 2018 - Aug 2018

- Reduced downtime by 3 hours / week by designing a greedy selection algorithm to predict QC results with 90% accuracy and skip QC waiting time for high success formulation.
- Improved the plant yield by 5% through modifying over 50 high failure formulations and operation conditions.

PROJECTS

Manufacturing Design of Gluten-Free Beer - *Professor Christine Moresoli*
Currently developing a beer production model using fungal peptidase to produce beer with a gluten content < 20 ppm, at a price under the current cost of commercially available GF beer.

Tetris.ai - *Personal Project* github.com/martinzwm/tetris-ai
Trained an RL agent from raw pixels with Double Deep Q-Learning and Prioritized Experience Replay to achieve super-human performance in Tetris.

Lane Detection - *Personal Project* github.com/martinzwm/lane-detection
Pipeline: Gaussian blur, Canny edge detection, RoI identification, Hough transform, lane classification

Technical Skills

Tools:	Macro (VBA), MATLAB, ASPEN, SAP CPLEX, Simulink
Languages:	Python, Java, C++, C, SQL
ML Library:	PyTorch, Tensorflow, Keras, Scikit-Learn, Captum

Extra Curriculars

Champion of intramural hockey
Assistant soccer coach for U15
Intramural basketball
Guitarist in a band
Rock climbing