

# Cheng (Barry) Chen

LinkedIn: [linkedin.com/in/barryatwork](https://www.linkedin.com/in/barryatwork) • Phone: +1 (647) 676 2854 • Email: [barry.chen@mail.utoronto.ca](mailto:barry.chen@mail.utoronto.ca)

Website: [barryf710.github.io](https://barryf710.github.io)

## RESEARCH INTEREST

---

- Data Analytics and Machine Learning
- Advanced Process Control and Optimization
- Biotechnology and Medical Innovation
- Sustainable Energy

## EDUCATION

---

**Master of Engineering, Chemical Engineering & Applied Chemistry** 2023 – Present

University of Toronto, Toronto ON

- Emphasis in analytics

**Bachelor of Engineering & Management, Chemical Engineering & Management (Co-op)** 2017 – 2023

McMaster University, Hamilton ON

- Unique 5-year program designed to provide engineering students with a business aptitude

## RESEARCH EXPERIENCE

---

**Undergraduate Thesis Student, McMaster University, Hamilton ON** 2022 – 2023

Supervisor: *Prof. Prashant Mhaskar*

- Researched offset-free approach for MPC, actor-critic method, and issues with the DDPG algorithm
- Conducted case studies on SISO and MIMO systems and proposed future improvements
- Prepared written term paper and oral presentation for the undergraduate thesis symposium

**Research Assistant, McMaster University, Hamilton ON** 2022 – 2023

Supervisor: *Prof. Shelir Ebrahimi*

- Developed open-access experiential learning modules focusing on design thinking and engineering improvisation
- Designed activity-based learning tools promoting an interactive and engaging learning environment

**Research Assistant, McMaster University, Hamilton ON** 2022

Supervisor: *Prof. Prashant Mhaskar*

- Troubleshoot significant performance discrepancy between MPC controllers in MATLAB m-file and Simulink file
- Solved continuous setpoints tracking issue in the Simulink reinforcement learning environment by integrating SDI data access method into local reset function

## PROFESSIONAL EXPERIENCE

---

**Technical Services Coordinator, Thermo Fisher Scientific, Mississauga ON** 2021 – 2022

- Facilitated manufacturing readiness by reducing group's overdue items by 25% in tight timelines
- Ensured the material specifications align with the latest requirements by communicating with business/project managers and clients in time
- Strived for right first time when maintaining multiple data indices and drafting documents complying with SOP and GMP requirements
- Earned Intensity Achieve, Integrity Inspire, and Involvement Inspire awards (4000+ points) for great teamwork, efficiency, and dedication

## PROJECTS

---

### Optimization Formulation & Solution

2023

- Cooperated in a team of 3 to explore real-world optimization applications in supply chain management
- Designed a dynamic supply chain network and formulated mixed integer linear/nonlinear programming models
- Performed case studies on biodiesel supply and solved the problem using GAMS

### Chemical Engineering Capstone

2022 – 2023

- Collaborated in a group of 4 to develop an optimization tool for Hatch Hydromantis to find the best possible wastewater treatment plant design using GPS-X
- Developed a Python script based on the NSGA-II algorithm to optimize the WWTP design by minimizing economic costs and environmental impact
- Awarded as the Best Industrial Application at the McMaster Engineering Capstone Expo Day

### Engineering & Management Capstone

2021

- Joined a multi-disciplinary team of 6 to tackle the resource allocation problem of Aecon's ESMSA team
- Reviewed the existing status of ESMSA team using business model canvas and researched current market solutions to compare the solutions qualitatively and quantitatively in the integration and cost-benefit aspect
- Maximized added value by proposing to extend the current construction management software license to incorporate the affiliated labour management software

### Machine Learning in Python

2020 – 2021

- Initiated a self-directed learning project about various machine learning topics
- Learned 20+ techniques of regression, classification, clustering, deep neural networks, natural language processing, dimensionality reduction, and decision making
- Coded a stacked LSTM model making one-step and multi-step forecasting to solve the stock price prediction problem in the COMAP math modeling contest

### Big Data Methods & Modelling

2021

- Collaborated in a group of 3 to work on Melbourne rainfall dataset to understand the correlations within variables and create a rainfall prediction model
- Identified positive/negative relationships among variables and lowered the dimensions from 15 to 7 while keeping 90% of the original information using PCA
- Improved prediction accuracy by 48% using logistic regression to predict rainfall likelihood instead of using neural networks to predict the rainfall quantity

### Chemical Process Synthesis & Simulation

2019

- Collaborated in a team of 4 to develop an innovative process that transforms waste plastics into ethylene and other valuable byproducts
- Participated in designing a feasible chemical process and drawing a diagram using Lucidchart
- Achieved 99% ethylene purity while emitting 78% less greenhouse gases than traditional process
- Analyzed the life cycle inventory, supply chain, and the environmental impact using openLCA

## SKILLS

---

### Laboratory

- WHMIS Trained
- Experienced with general chemistry, polymers, wastewater treatment, fluid circuit, distillation column, heated tanks

### Software

- Proficient in Microsoft Office Suite, MATLAB, Simulink
- Experienced with GAMS, Autodesk Inventor, Aspen Plus, Power BI, AutoCAD, openLCA, Minitab

### Programming

- Proficient in MATLAB, Python
- Experienced with GAMS, VBA, HTML, CSS, SQL

## CERTIFICATION

---

- Lean Six Sigma Black Belt

## MEMBERSHIP

---

**Summer Student**, McMaster Advanced Control Consortium, Hamilton ON

**2022**