Lucian Cheng

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Education

McMaster University **Sep 2021 – Exp. Apr 2026**

*Bachelor of Mechatronics and Biomedical Engineering Co-op — **CGPA: 4.0*** *Hamilton, ON*

Coursework: Data Structures and Algorithms Design and Analysis, Software Development and Design, Safety Critical System Design and analysis, Embedded Systems Design, Signals and systems, Analog and Digital Circuits, Software Architecture

Work Experience

Bluewrist Inc. **May 2023 – Aug 2023**

Software Engineering Intern *Markham, ON*

- Independently learnt and implemented the PointNet++ **ML Artificial Intelligence model** in PyTorch and **Python** for part segmentation for computer vision from 3D point cloud data, resulting in a **4-week** time reduction across **10 people**
- Utilized robots for scanned data collection, conducted & supervised ML process, achieving a testing accuracy of >**98%**
- Optimized runtime of a DLL by **86.4% (38.1s)** per **250k** points by producing a **C++** inference program with LibTorch & CMake using CUDA/GPU and CPU memory
- Created a WinForms UI in **VB.NET** to streamline machine learning for other engineers, emphasizing user experience, with a **Python** and **C++** PyTorch back-end to display relevant input/output data and manage >**600** samples
- Conducted regression testing of an SQL database software for product releases, identifying **8** bugs in the process

McMaster University **Sep 2023 – Dec 2023**

Computational Mechanics Teaching Assistant *Hamilton, ON*

- Mentored **8-9** students bi-weekly on challenging statics concepts, elevating their grades to >**90%** through lab tests

Projects

Embedded Systems Design Project | *Demo/Code*

- Utilized the **I2C** communication protocol in **C++** with an EEPROM to achieve non volatile data stores
- Implemented a responsive touchscreen LCD to utilize PWM outputs to control **5** actuators with RTOS
- Used the **SPI** communication protocol to integegrate multiplexing with actuators using an external shift register

Pacemaker Project | *Demo/Code*

- Directed a group of **5** to develop a safety critical system of a pacemaker made with **Simulink** and a **Python** UI through active communication and following the software development life cycle via the agile software development practice
- Designed a UI using Figma and developed it in **Python** using Tkinter while implementing **10** functional pacing modes, encrypted **10** local user data stores, sensor readings from **2** heart chambers, and patient history reports
- Deployed serial communication between UI and device with Pyserial for data transfer of **25** parameters and verification
- Generated technical documentation highlighting requirements and design specifications, the development cycle, verification and validation of requirements through test cases, and safety and hazard analysis using the GSN notation

Cart Centering Genetic Programming | *Demo/Code*

- Created binary trees and stacks in **C++** to represent equations for fitness calculations and algorithms to modify and mutate select trees over generations to implement reinforcement learning for the best result in the **186th generation**
- Reduced the size and depth of the best tree of the example program by **70.4%** and **50%** through mutation optimization

Extracurricular Activities

McMaster EcoCAR EV Challenge **Oct 2022 – Present**

Connected Automated Vehicles Team Member *Hamilton, ON*

- Researched and developed prototype algorithms for lead vehicle identification in **Python** for the CACC feature of ADAS, testing >**100** concurrent generated vehicles along with visualization of simulation and verification of code using Pytest
- Implemented advanced simulation test metrics for vehicle jerk and time-to-collision of lead vehicle with <**3%** error

Technical Skills

Languages: Python, C, C++, Embedded C++, VB.NET, HTML, CSS, Javascript

Technologies: PyTorch, Raspberry Pi, Embedded Systems, .NET, CMake, Pytest, Tkinter, Pyserial, React

Software Skills: AutoDesk Inventor, MATLAB, Simulink, Multisim, Linux, Windows, MacOS, JIRA, Git