# 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*

**Courses**: Data Structures & Algorithms Design & Analysis, Software Architecture & Development, Embedded Systems Design, Signals & Systems, Analog & Digital Circuits, Operating Systems

## Professional Experience

**Bluewrist Inc.** **May 2024 - Present**

*Incoming Software Engineering Intern* *Markham, ON*

- Executed 2D ML Anomaly Detection in **PyTorch** & **Python** for identification of faulty scans with an accuracy of **98%**
- Spearheaded the end-to-end development of a full-stack ML application for 2D & 3D data collection, training, and inferencing for largescale deployment for >**10** major customers with **.NET** and **Flask** for local servers

**Bluewrist Inc.** **May 2023 - Aug 2023**

*Software Engineering Intern* *Markham, ON*

- Implemented the PointNet++ **Deep Learning ML Artificial Intelligence model** in PyTorch for part segmentation of computer vision from 3D point cloud data, resulting in a **4-week** time reduction across **10 people**
- Prepared 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 of >**600** samples
- Conducted regression testing of an SQL database software for product releases, identifying **8** bugs in the process

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

*Connected Automated Vehicles Team Member* *Hamilton, ON*

- Developed 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
- Drafted advanced simulation test metrics for vehicle jerk and time-to-collision of lead vehicle with <**3%** error

## Projects

**Smart Baby Monitor Device** | *Demo/Code*

- Invented a baby monitor prototype to detect cry frequencies and identify issues with a filter circuit between **1k-5k Hz**
- Constructed a back-end database using **MongoDB**, **AWS**, and **Python** for user data stores and continous polling to achieve an identification accuracy of >**99%** and a feedback time of <**1s**

**Pacemaker Project** | *Demo/Code*

- Directed a group of **5** and saw end-to-end creation of a full-stack pacemaker safety critical system design made with **Simulink** and a **Python** UI following the software development life cycle via the agile software development
- Designed using Figma and developed it in **Python** using Tkinter while implementing **10** functional pacing modes, encrypted user data stores, sensor readings from **2** heart chambers, and iterated through prototypes
- Deployed serial communication between UI and device with Pyserial for data transfer of **25** parameters and verification
- Conceptualized technical documentation for requirements and design specifications, verification and validation of requirements through test cases, and safety, risk/hazard analysis using the mitigating **12** hazards

**Cart Centering Genetic Programming** | *Demo/Code*

- Evaluated reinforcement learning in **C++** to conduct code mutations with 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

## Technical Skills

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

**Technologies**: PyTorch, Raspberry Pi, Embedded Systems, .NET, CMake, Pytest, ReactJS, MongoDB, AWS, NumPy

**Software Skills**: Git, Github, Gitlab, Linux, MATLAB, Windows, MacOS/OSX, JIRA, Figma