

# BILL ZHANG

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## PROFESSIONAL EXPERIENCE

### Queen's University

Jan – June 2025

#### Hardware-Software R&D Assistant

- Developed a base station integrating five IoT devices with energy harvesting modules and a Raspberry Pi. Integrated Python-based ML algorithm into the framework to study how fluctuating power availability impacts model inference latency, throughput, and accuracy under real-time constraints.
- Implemented control scripts to manage data transmission between IoT devices and the Raspberry Pi, debugging latency issues with tools like Wireshark and perf, and optimizing I/O throughput.
- Designed and validated two network emulation prototypes using NE-ONE network emulator, simulating diverse network topologies and bandwidth constraints to evaluate communication bottlenecks in distributed ML systems. Configured custom protocols and sub-layer validations to quantify performance trade-offs between the server and IoT devices.

### Salesforce

May - Sep 2024

#### ML/AI Specialist

- Implemented a customized ML algorithm using PyTorch with CUDA acceleration, optimizing GPU memory allocation and compute throughput for large-scale customer preference modeling. Improved training and inference efficiency by tuning batch sizes, memory pinning, and kernel-level operations.
- Developed a two-layer digital transformation strategy for a Canadian bank, integrating Salesforce CRM with ML-driven analytics pipelines to deliver personalized financial advice, credit scoring, and product recommendations.
- Identified existing ML pipeline bottlenecks (low data preprocessing, poor model visualization) and proposed optimizations using power management and compute scheduling.

### AMOREPACIFIC Corporation

Sep 2023 - Apr 2024

#### Hardware Design Specialist

- Led development of a smart mirror system integrating hardware and AI, using SolidWorks for mechanical prototyping and OpenCV for real-time computer vision. Designed and tested electronic circuit bundles including microcontrollers, power regulators, and memory drivers, addressing challenges in data throughput and hardware-software synchronization.
- Integrated ML models from TensorFlow into facial detection devices, enabling the devices to predict facial changes. At the same time, we applied RTL simulation and security verification technologies to conduct multiple rounds of quality testing, ensuring that the instruments can run smoothly in different environments and with different customers.

### FutureCite

Jan – July 2023

#### Cloud Engineer

- Migrated the company's physical storage and operating system to Google Cloud to enhance the company's multi-cloud strategy and system resilience through utilizing open-source frameworks such as PyTorch and TensorFlow and integrating cloud computing via Google Vertex AI into the system.
- Led a team on a project related to Federated Learning and latency and bandwidth optimization, designing hardware systems (end-user devices, network simulators, servers) to demonstrate that latency caused by the physical distance between users and servers can be optimized through Federated Learning.

## EDUCATION

### Queen's University, Canada

May 2023 -Nov 2024

#### M.A.Sc. Electrical and Computer Engineering

- Overall GPA: 4.3/4.3
- Research Direction: Federated Learning, Communication Networks, Communication Optimization, Green Energy Design

### Queen's University, Canada

Sep 2019 – June 2023

#### B.A.Sc. Electrical Engineering

- Overall GPA: 3.65/4.3
- Award: Three times Dean's Scholar Awards (2020-2023), Charles Allan Thompson Award (2022), Queen's University Excellence Scholarship (2019)

## PROJECTS

### Next-Gen Robotic Gripper for Human-Robot Interactions

Sep 2022 – Apr 2023

- Led the team in hardware implementation and fabricated three prototypes of a feasible robotic gripper using three software tools: Cura, Fusion 360, and Blender. Evaluated the differences in physical movements, compatibility with the existing Panda robotic arm, and assembly complexity.
- Conducted extensive research on suitable 3D printing filament materials to enable the gripper to handle solid-state materials such as quartz and magnetite. Integrated OpenCV into the finalized prototype, allowing the gripper to perform dodging operations when it detects potentially harmful objects.