Tianrui Luo

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EDUCATION

Master of Engineering | Electrical and Computer Engineering **Expected December 2025**

University of Toronto *Toronto, Canada*

Bachelor of Applied Science | Major in Electrical and Computer Engineering **June 2024**
Minor in Artificial Intelligence Engineering and Engineering Business

University of Toronto *Toronto, Canada*

- Relevant courses: Machine Learning & Artificial Intelligence, Reinforcement Learning, Probability, Robotic Modelling

PROFESSIONAL EXPERIENCE

Analog Mixed Signal Design Intern **June 2022- June 2023**

Marvell Technology Inc. *San Jose, United States*

- Designed mixed signal co-simulation testbench setup in PCIe design.
- Coordinated with designers to validate and perform netlist functionalities.
- Performed Static Timing Analysis and cell characterization on digital circuits.

Hardware testing Intern **May 2021- Aug 2021**

Roborock Technology Co.Ltd *Beijing, China*

- Collaborated with the hardware testing team to monitor the product testing of Robot Vacuum.
- Analyzed and identified anomalies in sensor reading datasets using Excel.
- Conducted rigorous tests on machines under extreme conditions to validate the effectiveness of protective mechanisms.
- Led monthly LDS radar evaluations and calibration procedures.

PROJECT EXPERIENCE

Machine Learning Approach to Material Selection and Design Optimization **Sep 2023 – Apr 2024**

- Established a comprehensive framework for automated material selection, integrating machine learning techniques with material selection from CAD models.
- Develop a machine learning model to automate material selection, taking CAD assemblies as input and providing data-driven material selection as output.
- Utilized a case study of a wind turbine planetary gear to validate the approach and demonstrate the framework's effectiveness.
- Optimized the design of the wind turbine planetary gear through software simulations and physical prototype creation.

Mask Detection Model Project **Jan 2022 – Apr 2022**

- Implemented a Convolutional Neural Network (CNN) in PyTorch for mask detection.
- Processed and categorized datasets from Kaggle using Pandas and scikit-learn.
- Ensured ethical considerations by balancing racial population in the training data to guarantee diversity and reduce bias.
- Collaborated in a team setting, utilizing tools such as Google Colab for simultaneous editing and version control.

TECHNICAL SKILLS

- **Language:** *Python, C, C++, MATLAB, Hardware Verilog, ARMV7 Assembly*
- **Framework and Library:** *PyTorch, NumPy, Pandas, scikit-learn*
- **Statistical Analytical Ability:** *Simple and Multiple Linear Regression, Logistic Regression, Polynomial Regression*