Mu(Henry) Ha

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TECHNICAL SKILLS

Mechanical Design: SolidWorks, Siemens NX, AutoCAD, ANSYS, GD&T
Manufacturing: DFM/DFA, FEA, SAP, Quality Control, Tolerance Analysis
Automation & Controls: C, C++, MATLAB, Simulink, Python, Arduino, PLCs, Sensors
Data & AI Tools: PyTorch, Scikit-learn, Pandas, NumPy, TensorFlow, SQL
Project Tools: Microsoft Project, Smartsheet, Lean Manufacturing, Six Sigma, Agile

EXPERIENCE

Mechanical Systems Engineer - Brilliant Automation Apr 2025–Jun 2025
- Developed a **predictive maintenance and automation system** to monitor the health of industrial machines using sensor data.
- Built and trained machine learning models (Ridge, Random Forest, LSTM) to **forecast potential failures**, while balancing accuracy and interpretability.
- Created an interactive dashboard for **operations management** to visualize real-time machine health scores, historical trends, and alerts for maintenance.
- Applied **lean manufacturing and six sigma** principles to streamline data workflows and improve system reliability.

Manufacturing Engineer - Weir Sep 2019–Apr 2020
- Estimated production costs and created **BOMs & routings** in SAP to support supply chain and production planning.
- Conducted mechanical testing and quality control, including gasket compression tests, deformation analysis, and root cause analysis (**RCA**) for design deviations.
- Re-engineered the **cost-estimation spreadsheet** to improve workflow efficiency by ≈ 40%, demonstrating process improvement and project management capabilities.
- Ensured compliance with safety standards, and manufacturing best practices.

Design Engineer - Weir Jan 2019–Apr 2019
- Designed and modeled a circular manifold for a chemical plant and retrofitted multiple spool systems.
- Created 30 + professional 3D models and 2D engineering drawings daily, using **Siemens NX** and **SolidWorks** with **GD&T** annotations.
- Coordinated with production and fabrication teams to manage design -for -manufacturing (**DFM**) and design-for-assembly (**DFA**).
- Performed design verification, including material selection, seal geometry, and basic stress checks to ensure compliance with client and industry requirements.

PROJECTS

AI Wall Painting Robot with Wall Segmentation - Python, Pytorch Feb 2024
- Implemented PSPNet for industrial wall segmentation, achieving 92% accuracy and 73% IoU, enabling automated wall-surface detection for robotic painting.
- Preprocessed data by flattening irregular wall segments, resizing images, and applying data augmentation.

UWAFT-Controls - Python, MatLab May 2024
- Designed and implemented control algorithms for an autonomous vehicle within Matlab's simulation environment.
- Derived kinematic and dynamic models to support motion planning and controls.
- Developed an EKF-based sensor fusion module to combine multi-sensor data for improved state estimation and system stability.

Robotic Manipulator System - MATLAB, Arduino Mar 2023
- Designed and implemented a control system for a robotic arm and pick-and-place manipulator, addressing coupling effects and system nonlinearities.
- Developed both manual and automated control modes with optimized trajectory planning for efficient and repeatable motion.
- Designed and fabricated mechanical components with GD&T-compliant tolerances, integrating sensors, wiring, and motor actuation via Arduino.
- Performed system identification, controller design, and hardware-in-the-loop testing to validate control accuracy and robustness.
- Applied Root Cause Analysis (RCA) and parameter tuning to troubleshoot performance deviations and enhance system reliability.

EDUCATION

B.Sc. in Mechanical Engineering
Artificial Intelligence Option
Management Science Option
University of Waterloo
Sep 2018 - Apr 2024

Master of Data Science
University of British Columbia
Sep 2024 - Jul 2025

HONORS & AWARDS

2025 - AWS Cloud Practitioner

2024 - CFA Level I

2024 - Dean's Honours List

2021 - Object Oriented Programming in Java Specialization

2020 - Machine Learning Certificate Deep Learning Specialization

2020 - Data Structure and Algorithms in C/C++ Certificate

OTHER EXPERIENCES

Cloud Engineer - Resolution Life US
Sep 2021–Apr 2022
- Delivered a standardized "golden image" for EC2 servers, streamlining the deployment process with preinstalled essential applications, with an increase of 80% in efficiency.
- Automated the generation of monthly dashboards to visualize RLUS's AWS usage, enhancing decision-making.

Data Scientist Research Assistant - UWaterloo Jan 2021–Apr 2021
- Employed U-Net on satellite images to accurately predict ice concentration and classify land, ice, and water.
- Achieved a validation loss and MSE of 0.026 on egression, along with an 0.9 validation accuracy for classification.
- Tested multiple regression methods and model structures to identify and implement the most effective approach.

HOBBIES & INTERESTS

2020 - Created a game using PyGame

2018 - Learned aviation knowledge in the air cadets program

2018 - Shop experience of car maintenance operations

2018 - First aid training