Adam Fong

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EDUCATION

Integrated Engineering (BASc)

University of British Columbia • Vancouver, BC • May 2025 • 81.7%

- Emphasis in Computer Engineering and Data Science.
- Dean's List: 2019-2020, 2021-2022 | NSERC Undergraduate Research Awards 2020.

SKILLS

Programming Languages: Python, C++, SystemVerilog, R | **Tools:** Git, Docker, SolidWorks, KiCad, ModelSim, Linux, Microsoft Office

EXPERIENCE

Research Assistant / Student Mechatronics Engineer

The Temporal Ecology Lab at UBC **September 2019 - Current, Vancouver, BC**

- Led the software, mechanical, and electrical design of a novel 3-axis microscopy imaging machine.
- Designed an FDM 3D printed repair for a sensor, saving the lab $17,500.
- Optimized an image stitching software package to deploy on RAM-limited computers.
- Rapid prototyping of 3D printed microtome adapter, image annotation scripts, and various data visualizations.

Student Electrical Engineer (R&D)

MacDon Industries **September 2023 - January 2024, Remote**

- Wrote multicore C++ and assembly language firmware for an RP2040 microcontroller to implement a human-machine interface.
- Designed electronics for a CAN node to be integrated into an existing wiring harness (subject to NDA).

Field Engineering Technician / Student Software Engineer

MacDon Industries **May 2022 – April 2023, Winnipeg, MB**

- Designed methods, collected photos for, annotated, and implemented a novel computer vision algorithm in Python (subject to NDA).
- Installed and tested mechanical and electrical prototype designs on agricultural heavy equipment across the USA and Canada.
- Designed a ruggedized logging system to plug into an existing CAN bus and record video / CAN traces.
- Maintained quality customer relationships and gained insight from customers using our prototypes.

PROJECTS

Tree Imaging Machine

The Temporal Ecology Lab • github.com/temporalecologylab/TreeRings • January 2024 - Present

- Designed a novel wood sample scanning machine to digitize tree cores and tree cookies at microscopic scale.
- Implemented automatic control of image focusing using a closed loop PID control of the Z axis.
- Generated G-code for motion planning to traverse a wood sample and capture partially overlapping images of the sample.
- Optimized the memory complexity of a Python package, Stitch2D, to stitch a grid of hundreds of images into a single image.

Perception for Robotic Arm

Advanced Engineering Design Course • github.com/afong3/kinect_publisher/tree/main • September 2023 - May 2024

- Wrote C++ ROS nodes for object segmentation of RGB-D data and to interface an XBOX KinectV2 sensor.
- Developed a method to cast results from a CNN object classifier onto segmented objects in PCL point clouds with image registration.
- Integrated perception results with MoveIt motion planning using coordinate frame transforms.

Deep Neural Network FPGA Hardware Accelerator

- Deployed the weights from a three-layer neural network trained on the MNIST handwritten digit dataset on an FPGA.
- Designed memory mapped hardware modules and C software for a System-on-a-Chip to accelerate deep learning inference.