LEAH HARTWELL

MECHANICAL ENGINEERING STUDENT

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CO-OP WORK EXPERIENCE

Machine Learning & Hardware Engineer → 3DQue Systems MAY 2021 → ONGOING

→ Leading development of a 3D printer monitoring system which detects a variety of common 3D printing failure modes by building temporal object detection models with TensorFlow and PyTorch
→ Automated mass data collection by programming multiple Python scripts that generate random print failure files, and creating Bash scripts to auto upload GCODE to printers and to take timelapses
→ Guided design of custom Pi Camera mount with adjustable arm to get optimal view of nozzle head

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Mechanical Engineering Co-op → entrepreneurship@UBC JUL 2020 → DEC 2020

→ Simultaneously worked at two startups - BIOFORM Technology and Verdi Expeditions - within the e@UBC HATCH Accelerator Program where I designed and built mechanical systems while learning the nuances of entrepreneurship

Mechanical Design Engineer → BIOFORM Technology JUL 2020 → JUN 2021

→ Responsible for designing and prototyping custom multi-layer nozzles, posttreatment and winding systems for production platform which will create stretch wrap and medical tubing for our pilot trial
→ Gained extensive design for manufacturability and assembly knowledge while working closely with senior engineering consultant when iterating through prototypes throughout the year

Machine Learning & Mechanical Test Engineer → Verdi Expeditions SEP 2020 → DEC 2020

→ Working on proprietary sensing unit to be used in new seed-round smart valves to sense flow/no-flow conditions through drip tube using a sensor and background neural network model
→ Designed, built and programmed an automated test jig to rigorously test solenoid valves to choose the best and most economic option to be used within each of the Verdi smart valves

RECENT PROJECTS

UBC Open Robotics Design Team

Mechanical Co-Lead → Pianobot SEP 2020 → DEC 2020

→ Responsible for guiding and leading junior members while overseeing all mechanical aspects of a robot which can read and play the piano at Level 4 RCM
→ Wrote a Python script which calculates force transferred from a linear actuator to the fingertip in order to find optimal dimensions for the finger design to press down piano keys

Mechanical Engineer → RoboCup@Home SEP 2019 → AUG 2020

→ Designed belt-driven differential gear systems for elbow/wrist allowing for compact joints and decreasing material cost for larger carbon-fibre chassis of arms for our autonomous service robot
→ Analyzed components with FEA in Solidworks Simulations to verify that parts could withstand known forces and torques on arm in static and dynamic states

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Kleaner → Personal Project APR 2020

→ Built a cleaning system for reusable Keurig cups which spins an angled cup holder using a stepper motor while water rinses coffee grounds out into a filter
→ Soldered Arduino, water pump, stepper motor driver, button, transistor, resistor, wires to PCB and programmed Arduino to control pump and motor with a button

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STOCKnote → Hack Western 7 (Best Hardware Hack Winner) NOV 2020

→ Won Best Hardware Hack out of 435 participants by individually creating a notification device that tracks real-time fluctuations in stock prices using a Raspi 4, OLED display, button, LEDs and Python
→ Users are able to create a watchlist and scroll through each stock shown on the OLED display
→ Sudden spikes or dips in the stock price are identified through an algorithm and are indicated on both the OLED display in words and by the flashing LEDs (increases/decreases and changes in speed are indicated through colour and flash variations)

EDUCATION

University of British Columbia
BASc in Mechanical Engineering, Biomedical Option
SEP 2019 → EXPECTED MAY 2023
Year 3 | CGPA 3.66
Co-op: Completed 3/4 work terms; Available for 8 months beginning January 2022

Kwantlen Polytechnic University
Engineering First Year Certificate Program
SEP 2018 → MAY 2019
Year 1 | CGPA 3.89
Certificate in Engineering (w/ Distinction)

TECHNICAL SKILLS

Software/Programming:

CAD/FEA/CFD
SolidWorks | OnShape | AutoCAD

Data Analysis
MATLAB | Maple | Excel

Languages
Python | Bash | C/C++ | HTML/CSS/Javascript

Operating Systems
Linux | Windows

Version Control
Git/GitHub

Machine Learning:
TensorFlow | PyTorch | scikit-learn

Hardware:

Machining
3D Printer | Mill | Lathe | Drill | Band Saw | Water Jet | Spot Weld

Microcontrollers
Raspberry Pi | Arduino | Microchip PIC

Actuators/Sensors/Transducers
Pumps | Motors | Infrared Sensors | Flow Rate Sensors | Pressure Transducers

Testing/Validation
Circuit Analysis | Soldering | Oscilloscope

Design:
DFM/DFA | FMEA/FEA/CFD | CAD | GD&T | Prototyping | BOM Specification