LEAH HARTWELL

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CO-OP WORK EXPERIENCE

Software & Mechanical Engineer ‖ Zoox — SF Bay Area, CA — MAY 2022 → SEP 2022
→ Achieved a key safety requirement for Zoox's L5 vehicle by developing a closures object detection model which triggers retraction of doors if an object is hit while automatically opening or closing
→ Decreased tooling cost, removed user misuse case and met studio requirement by modeling new door casting features and forged brackets in CATIA to package hinges inside door frame
→ Eliminated cost of manufacturing entire door assemblies that characterize performance of new door actuators by designing a compact dynamometer that automates variable-load testing

Embedded Systems Software Engineer ‖ BlackBerry — Waterloo, ON — JAN 2022 → APR 2022
→ Validated radar device's control modules by creating robust unit tests for each function within each target module in C/C++ using GoogleTest and Fake Function Framework
→ Improved user experience of radar data parsing application by producing a set of automation scripts in Bash to easily install, run and uninstall tool on Linux systems

ML & Hardware Engineer ‖ 3DQue Systems — Vancouver, BC — MAY 2021 → SEP 2021
→ Founded 3DQue's SpagettiVision™ by leading development of a 3D printer monitoring system that detects a variety of common 3D printing failure modes using TensorFlow and PyTorch
→ Saved countless hours of manual data collection by writing Python scripts that generate random print failure files and Bash scripts that auto-upload GCODE to printers while taking timelapses

Mechanical Design Engineer ‖ BIOFORM Technology — Vancouver, BC — 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

ML & Mechanical Test Engineer ‖ Verdi Expeditions — Vancouver, BC — SEP 2020 → DEC 2020
→ Developed models for proprietary sensing unit to be used in new seed-round smart valves to detect flow/no-flow conditions through drip tube using frequency data
→ Designed, built and programmed a test jig to rigorously test solenoid valves in order to choose the best and most economic option to be used within each of the Verdi smart valves

FEATURED PROJECTS

UBC Open Robotics Design Team

Mechanical Co-Lead ‖ Pianobot — SEP 2020 → DEC 2020
→ Oversaw mechanical aspects of robot and guided junior members in design and spec parts
→ Wrote a Python script that 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 decreased material cost for larger carbon-fiber chassis of arms on 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

STOCKnote ‖ Hack Western 7 — 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 RPI 4, OLED display, button, LEDs and Python
→ 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

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

EDUCATION

University of British Columbia
BASc in Mechanical Engineering, Biomedical Option
SEP 2019 → EXPECTED MAY 2023
Year 4 • CGPA 3.66

Co-op: Completed 5 work terms
Available for full-time roles in May 2023

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
CAD/FEA/CFD
CATIA • SolidWorks • OnShape • AutoCAD

Data Analysis
MATLAB • Maple • Excel

Languages
Python • Bash • C • C++ • C# • HTML/CSS/Javascript

Operating Systems
Linux • Windows

Version Control
Git/GitHub • Gerrit • Subversion

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
Torque Transducer • Postion Sensor • Pumps • Motors • Infrared Sensors • Flow Rate Sensors • Pressure Transducers

Testing/Validation
CANalyzer • Soldering • Oscilloscope

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

⚙️ Leah Hartwell's Technical Project Portfolio

This portfolio features most of the projects I have worked on over the years. I chose to build this collection of technical projects on Notion so that it could work as a kind of "living document" as I add to older projects and start new ones in the future. If any of the projects catch your eye, click on its card below to learn more details. Feel free to connect with me on LinkedIn or shoot me an email if you would like to discuss any projects as well!

⊞ Gallery view ⌄   🔍 Search
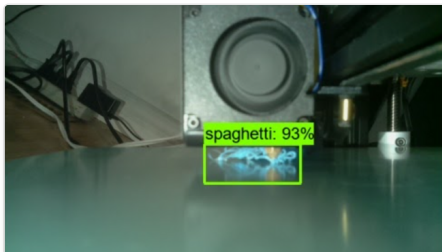
🖥️ 3D Print Checker: Failure Detection System

May 3, 2021 → September 3, 2021

`Leah Hartwell`

`Machine Learning` `TensorFlow` `PyTorch` `Python` `B...`
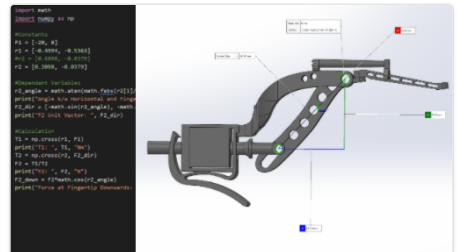
`3DQue Systems Inc.`

🖥️ STOCKnote: Real-Time Stock Notification S...

November 27, 2020 → November 29, 2020

`Leah Hartwell`

`Python` `Raspberry Pi` `GPIO` `LEDs` `OLED Display`

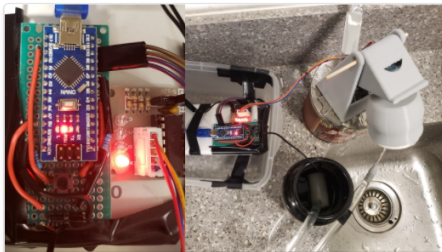`Hack Western 7` `Best Hardware Hack`

🤖 Pianobot: Piano Playing Robot

September 8, 2020 → December 31, 2020

`UBC Open Robotics Design Team`

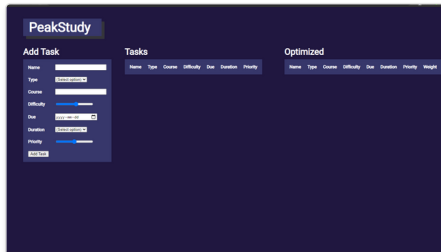`Leadership` `SolidWorks` `Python`

`Mechanical Co-Lead`

🖥️ Kleaner: K-Cup Cleaning System

April 27, 2020 → May 25, 2020

`Leah Hartwell`

`Arduino Nano` `Stepper Motor` `Water Pump` `Transist...`
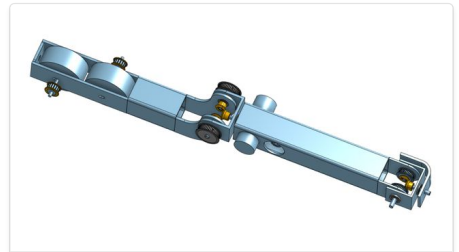

🖥️ PeakStudy: Task Optimization Web App

March 6, 2020 → March 8, 2020

`Leah Hartwell & Joya Lee`

`HTML` `CSS` `Javascript`

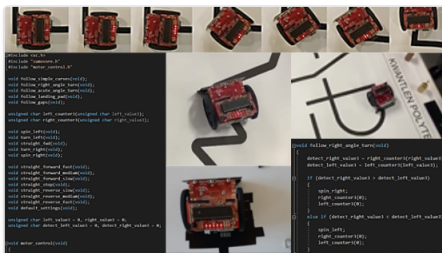`cmd-f 2020 Hackathon` `Top 10`

🤖 Robotic Arm: Autonomous Service Robot

September 8, 2019 → April 30, 2020

`UBC Open Robotics Design Team`

`OnShape` `SolidWorks Simulations (FEA)`

`RoboCup@Home Competition`

🖥️ SOP (Slap-On-Plastic): Line Following Robot

March 4, 2019 → April 8, 2019

`C` `IR Sensors` `Motors`

`APSC 1299 Robotics Contest` `3RD Place`