Magnolia Holzwarth

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Canada

Education

- **University of Calgary, Alberta** — Alberta, AB
  Bachelor of Science, Mechanical Engineer, Mechatronics Minor — *Graduated with a 3.8 GPa in November, 2024*

Experience

- **SOLIS** — Calgary, AB
  Electronics Designer, Contract — *Jul 2024 - Present*
  - **Embedded Development**: Developed firmware for the ESP-IDF and STM32 platforms to drive a CCD sensor, gather image data, and transmit 4K pixel images to a computer running a custom driver, via serial connection.
  - **PCB Design**: Designed, procured, and tested product boards containing microcontrollers, optical sensors, and USB-C connectors. Used KiCAD extensively for product design.
  - **Optical Device Design**: Designed and prototyped a NIR micro-spectrograph using advanced hardware miniaturization techniques and fiber optic techonlogy to save $200k on material and assembly costs. Oversaw E-commerce shop creation for finished product.

- **WSP Canada** — Calgary, AB
  Project Engineering Intern — *Jan 2022 - Jan 2023*
  - **Mechanical Design**: Audited and red-lined piping and instrumentation diagrams for multiple oil & gas capital improvement projects worth over $150 million. Performed piping stress calculations for over 3 kilometers of 42" OD pipeline to ensure compliance with B149 and other applicable standards. Performed heating calculations to facillitate the commissioning of mutliple HVAC units.
  - **Procurement**: Authored quotation requests and oversaw the appraisal and procurement process on over $88 million of oil and gas assets, including piping, valves, pipe fittings, remote buildings, and HVAC units. Communicated with vendors as a consultant on behalf of WSP's client, Enbridge, to fulfill the scope of reqeuirements on time. Navigated inflated lead-times during the tail-end of the pandemic.
  - **Engineering Automation**: Developed scripts to automate the process of comparing current MTO (material takeoff) line-items to exports generated automatically by AutoCAD technicians working on a separate team. This allowed over $20 million in erroneous procurement to be avoided, and additionally saved months of lead time on project delivery.

  Automation Engineering Intern — *Jan 2022 - Jan 2023*
  - **Logic Controller Programming**: Programmed PLC controllers to regulate the duty cycle of pumps in multiple heat exchanger stations for the ESAP federal heating upgrade, contributing to an annual net power savings for the Canadian federal government of over 80 MW. Integrated the PLC into the building's existing SCADA system.
  - **Instrumentation Drafting**: Effectively managed two subordinate draftspeople on the ESAP heating upgrade in Ottawa, and audited final network drawings with respect to internal documentation. Oversaw the authoring of over 200 pages of networking documentation on behalf of the federal government. Developed a software system for auditing and correcting instrument index line items against prior versions, color-coding and raising line-items with changes or discrepencies to aid in engineering review. Saved over 100 hours a week of budgeted engineer hours for the duration of the project.

- **Department of National Defense** — Cold Lake, AB
  Junior Infrastructure Planner, Remote — *May 2021 - Sep 2021*
  - **HVAC Design**: Planned, engineered, and drafted several HVAC systems for 3 mission critical military buildings at CFB Cold Lake, including cooling systems for servers directly governing fighter jet flight operations. Drafted comprehensive and professional Scope of Work (SOWs) and ensured project alignment through consistent follow-ups with contractors throughout the construction quoting process.
  - **Office Automation**: Saved over $156k and multiple weeks of labor hours among senior staff via the design of paperwork automation scripts to go re-format and organize legacy scopes of work into a format easily accessible by military personnel.

Projects

- **Apparel Folding Device**: Mechatronics device capable of rapidly and reliably folding apparel garments such as tee-shirts, sweat-shirts, and hoodies. Developed in collaboration with local calgary business Local Laundry. Video demonstration.

Skills

- **Design Programs**: KiCAD, SOLIDWORKS, OnShape, AutoCAD (and related), ESP-IDF, STM32-IDE, Ladder Logic, Git/Github, Visual Studio Code
- **Languages**: Python, C++, C, C#, SQL, LaTeX, OpenCV, HTML/CSS, Nginx
- **Office Software**: Microsoft Office Suite, Git, Bluebeam

Previous Experience

- **University of Calgary** Calgary, AB
  Schulich Engineering Challenge, Senior Division Director *July 2020 - Sept 2020*
  - **Leadership**: Lead design and delivery of a collegiate engineering competition centered around robotics automation. Winning team went on to win at the regional level at WEC 2020 (Westen Canada Engineering Challenge), and at the national level later on.
  - **STEM Outreach**: Conducted STEM education outreach at town halls and schools, promoting science and engineering to diverse audiences and inspiring the next generation of engineering students.