Andrew Munro-West

(604) 710-3037 | andrewmunrowest@gmail.com | amunwes | amunwes.github.io
linkedin.com/in/andrew-munro-west

Technical Skills

Languages:	Python, C/C++, SQL, HTML, Javascript, Verilog, GDScript
Software:	Docker, AWS, Node.JS, PostgreSQL, Linux, Pandas DSA, OOP, ML, DSP, Git, CI/CD, Multi-Threading, Databases, Operating Systems Microsoft Office, Microsoft Excel, LaTex
General:	Scientific Presentation, Report Writing, Product Development, Scripting & Automation, Data Exploration, Rapid-Prototyping, Machine learning, Data Visualization, Research

Education

The University of British Columbia **Vancouver, BC**
Bachelor of Applied Science in Electrical Engineering with Distinction *June 2023*

Experience

Cadex Electronics **Richmond, BC**
Research Software Engineer *Jan 2022 - Aug 2022*

- Applied **critical thinking skills to isolate and diagnose fatal errors** in code deployed onto the company's custom hardware without a debugger terminal.
- Developed user friendly **data acquisition and processing** tools deployed to custom hardware streamlining testing procedures and reducing testing time from months to weeks, cutting estimated test time by **85%**.
- Wrote and integrated Python code to safely interact with **AWS secure cloud PostgresSQL databases** into existing projects, facilitating efficient and safe data sharing and collaboration among team members.
- Played an instrumental part in the hiring process of new employees, vetting, giving technical interviews and eventually **on-boarding** them, walking them through the complexities of our code base.
- Gathered, organized and processed **1000's** of battery tests condensing the findings and visualizing the results in Matplotlib and Seaborn before presenting the results and **explaining the relevance of specific trends** seen in the data to upper management.

In partnership with UBC & Yamaha Line 6
2D String Vibration Feasibility Study *Sept 2022 - April 2023*

- 8 month capstone project researching the feasibility and uses of 2D string modelling on guitars.
- Wrote **comprehensive documentation** and organized weekly meetings to discuss team logistics such as budget, time, workload distribution and generating avenues for research and applications.
- Organized regular meetings to present ideas for real world applications of the technology to guide our efforts, received constructive feedback to implement into our designs, and give progress updates to our clients.
- Honed **presentation skills** demonstrating our research and the real world applications of our work to our clients and peers in both a project fair and in closed door presentations with professors.

Verdi
Electrical/Software Engineer (Casual On-Call) *May 2021 - Present*

- Provided technical support in helping a small startup meet production deadlines and grow their business, giving insights into optimizations of the assembly process and improvements on Hardware and Software design.
- Assisted in research into factors affecting system integrity such as water hammer effect and pressure on valves.
- Organized and trained a workforce to streamline assembly of **1000's** of devices in order to meet tight deadlines.
- Soldered and applied conformal coating to **1000's** of PCBs installed into water-tight block valve control devices.
- Software development as needed.

Technical Projects

Suika Game Clone

Personal Project *Dec 2023*

- Built a working clone of the recently popular Suika Game utilizing the Godot 4.1 Open source game engine.
- Designed using a tree based structure and OOP principles to organize object behavior and responsibilities.
- Created a simple UI to control the play loop and save scores between sessions.
- Currently beautifying before I write an accompanying tutorial and hosting the project on my site.

Docker Tutorials

Personal Development *Oct 2023*

- Worked through Docker tutorials to gain proficiency with the platform for professional development.
- Became familiar with containerizing Apps, and building images, utilizing volumes to link a database and allow data to persist between sessions.
- Created a multi-container App using Docker Compose and a multi-container network connected to a MYSQL database.

Personal Website

Personal Project *Aug 2023-Present*

- Built and am maintaining a personal website to act as a portfolio and personal blog.
- Utilized the Jekyll static website builder to automate implementation.
- Hosted on GitHub pages and maintained using a **CI/CD workflow** to automatically rebuild the site on commit

Movie Genre Classification using NLP

UBC Project *Nov 2022*

- A self-guided term project exploring **multi-label genre classification** of movies comparing accuracy metrics of several common machine learning classifier algorithms.
- Cleaned a dataset of **40,000 movies with over 100 unique** genre tags using Natural language processing to remove redundant tags and stop words from the data set reducing the complexity of the task significantly.
- Compared the accuracy, training time, and perceived biases of random forest, logistic regression, and multinomial naive Bayes classification algorithms, **determining the optimal choice of algorithm**.
- Recorded the findings and procedure in a **comprehensive research report** providing insights into the strengths and shortcomings of each algorithm for **NLP classification**.

Auto Testing Application With Graphical Interface

Cadex Electronics *June 2022*

- Designed and implemented a python application to **automate battery testing**.
- The application would connect with the company's custom hardware over USB, control the device using custom API commands, and monitor the device's status and logs for errors.
- Created repetitive testing behaviour to run multiple tests back to back rather than manually initializing the next test, dramatically boosting testing efficiency and productivity of research engineers **85%**.
- Built a responsive multi-threaded GUI with read/write access and cloud capabilities to name and catalogue data simplifying test procedures.

SCARA Robot Simulation

UBC Project *Mar 2021*

- Designed and simulated a SCARA 3.5 DOF robotic arm.
- Used **3d simulation software** in combination with **Matlab** to simulate the mechanical model and control system for demonstration.
- Worked in a team of 3 to design a working electrical system, control system and mechanical model.

Digital Systems Design Projects

UBC Project *April, 2021*

- Programmed a **DE1-Soc FPGA in System Verilog** using the **Intel Quartus II** design software to complete the following projects during the 4-month course curriculum.
- Programmed the FPGA to act as a **simple music player**, utilizing FSMs to handle keyboard inputs and read data out of memory to play, pause, and stop music.
- Implemented a signal intensity meter for the music player by interfacing with the **embedded picoblaze processor to apply real-time averaging** on the music signal to retrieve the intensity which was then displayed.
- Designed and implemented an **RC-4 encryption core** and then utilized a brute force algorithm to crack the RC-4 encryption on a otherwise unknown message.
- Instantiated a 5 bit LFSR operating at 1Hz and a DDS to generate a 3Hz carrier signal and then utilized the LFSR to modulate the carrier sine to generate ASK and BPSK signals.
- Connected the modulated signals through muxes to a VGA oscilloscope for display and then generated an FSK signal using QSYS and Nios interrupts.

Discord Chatbot

Personal Project *June 2020*

- Hosted a discord bot written using the discord.js module to interact with the **discord API**.
- Designed and built a simple bot to monitor server channels for input and react to simple commands.
- Built a small **server with Node.js** to periodically ping the bot keeping it active.

Publications

Conference	Paper Title	Publication Date
PHM2023	"Electrochemical Impedance Spectroscopy and Machine Learning based Battery State of Health Estimation" **https://ieeexplore.ieee.org/document/10194065**	05 June 2023