

Mark Van Genderen Electrical Engineering Student

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TECHNICAL SKILLS

Hardware: Altium & Eagle, EMC design, PCB Validation & EMC Certification, Soldering & Rework

Firmware: C, Git, Java & Python, RTOS, Embedded Programming (stm32, esp32, pic32), Bash, GDB

General: Debugging, Presentation, Controls (MATLAB, Simulink), HDLs (Verilog, SystemVerilog)

WORK EXPERIENCE

Generac Power Systems, Vancouver, BC

May, 2022 – Present

Firmware Engineer (Co-op) - Clean Energy

August, 2023 – Present

- Developing embedded C firmware for an innovative power management product in the clean energy industry, which relies on an ARM-based MCU to create functionality and meet safety requirements
- Completing sprint tasks that would have been assigned to my supervisors—implemented time-optimized logging, CLI command, relay, etc. modules and added to CAN, DSP, unit test, etc. modules
- Participate in code review, peer programming, and technical communication to learn from my mentors

Hardware Engineer (Co-op) - Clean Energy

May, 2023 – July, 2023

- Validated and certified several aspects of a safety critical power management PCB
- Debugged firmware on stm32 IDE and employed an environmental test chamber to perform stress tests on a high-powered circuit, which guided major design decisions

GlückKind Technologies, Vancouver, BC

May, 2022 – January, 2023

Electrical Engineering Co-op

- Designed and tested a >150 component PCB with strict mechanical constraints to meet hardware and software requirements for use in the first production model of the stroller
- Performed experiments and developed firmware to test a variety of sensors for use in the ML pipeline
- Debugged AI stroller prototypes to allow for frequent software tests and demos
- Communicated with industry partners, media, government representatives, and buyers at Vegas CES 2023 to further the company's interests in preparation for the launch of the first production model

UBC Computer Science/ECE, Vancouver, BC

September, 2021 – April, 2022

TA for CPSC 213 (Intro Computer Systems)/APSC 160 (Intro Computation in Engineering Design)

- Presented to over a dozen students during weekly laboratory sections, where I solved worksheets with active participation of the class to reinforce core concepts from the previous week's lectures
- Taught software architecture, operating systems, and I/O architectures during office hours to clarify difficult concepts and provide students with the tools to solve problems independently
- Guided students through course concepts during lectures to improve student comprehension

EDUCATION

University of British Columbia

April, 2025

Bachelor of Applied Science - Electrical Engineering, Minor in Computer Science

CGPA: 80%, 4th Year Standing

ECE Topics: Circuit Analysis & Design, Systems & Control, Electronic System Design (with HDLs), Signals

CPSC Topics: Operating Systems, Algorithm Design and Analysis, Software Engineering

Co-op: Available for up to 8 months beginning January 2024

PROJECTS

BLDC Motor Controller, (Personal Project)

May, 2023 – Present

<https://github.com/mark-van/controller>

- Designed a 300A 70V BLDC controller schematic to conform to relevant safety and EMC standards
- Developing thorough documentation that describes the design's protective circuitry and safety considerations so that it may act as a resource for future projects

Attention Is All You Need Implementation, UBC**January, 2021 – April, 2021**<https://github.com/mark-van/Attention-Is-All-You-Need-Implementation>

- Implemented a transformer model to solidify my understanding of fundamental deep-learning concepts
- Authored paper describing my model to contribute to the expanding transformer learning community

Two DOF Robotic Arm, UBC**January, 2021 – April, 2021**

- Modeled motor, amplifying, and other systems while considering non-linearities to create a detailed simulation of the arm's performance using MATLAB, Simulink, and SimulationX
- Devised path planning, sensor, and PID firmware to replicate simulated results on hardware

Cookie Break App (Personal Project)**July, 2021 – August, 2021**github.com/mark-van/cookie-break

- Developed local database, persistent preferences, and thoughtful user experience to produce an Android app that tracks user cookie-eating habits

DOGE Crypto Bot (Personal Project)**July, 2021**

- Programmed cryptocurrency trading bot using HTTP requests and WebSocket to perform 24/7 trading

Basic Microcomputer, UBC**September, 2020 – December, 2020**

- Created simple microcomputer from scratch with Verilog, ModelSim, and Quartus Prime to better understand components such as CPU, Datapath, ALU, and Memory

ENGINEERING STUDENT TEAMS**UBC Thunderbikes, UBC****September, 2019 – August, 2022*****SM21 Controls and Peripherals Sub-team Lead*****March, 2020 – August, 2022**

- Lead 2-4 CPSC and APSC students, which entailed weekly meetings, reliable communication, recruitment interviews, and assigning clear tasks, all to ensure team goals were achieved on schedule
- Applied course material and research skills to determine a suitable data acquisition system, a CAN interfacing display, and ensure compatibility between all electrical systems employed on the build

INTERESTS & ACTIVITIES

- Sports: Mountain biking, snowboarding, soccer, tennis, ultimate, running
- Tech: TinyML, EV design, reading the free digital view of interesting UL safety standards, read & annotated Electromagnetic Compatibility Engineering by Henry W. Ott, hearing
- Work Conversations: Terrifying design for reliability failure stories, asking co-workers for their best 'perfect-storm' story
- Personal: Making Curry, themed parties, reading

Professional Objectives

- Learn how to design, validate, and certify hardware and firmware for consumer and industrial markets
- Contribute to advancements in clean energy, AI, robotics, and electric vehicle technology