

# SEIYA NOZAWA-TEMCHENKO

(778) 991-4574 | [seyiant01@gmail.com](mailto:seyiant01@gmail.com) | [linkedin.com/in/seiyant/](https://linkedin.com/in/seiyant/) | [seyiant.github.io](https://seyiant.github.io)

## EDUCATION

### University of British Columbia

Bachelor of Applied Science in Electrical Engineering

**Relevant Coursework:** Deep Learning, Digital Design, DSP and IP, Software Design, VLSI Systems

Vancouver, BC

Sep. 2020 – May 2025

## EXPERIENCE

### Dashboard Design Engineering

UBC ThunderBikes (University Design Team)

Jul. 2023 – Present

Vancouver, BC

- Developed embedded firmware in **C** on an **STM32-based** dashboard to decode **CAN bus** messages
- Created a responsive **UI** using the **LVGL library**, displaying real-time **battery charge** and **RPM** by integrating battery management system and motor controller signals via CAN bus
- Designed custom **PCBs** to interface with key vehicle systems like **ignition**, forward/reverse select, **emergency stop**, dead-man's switch, **charge enable**, and an analog **throttle**
- Engineered relay and fuse systems with custom **wire harnesses**, integrating a **112V battery** for reliable power
- Developed a **MATLAB-based racing simulation** using real-world measurements to model motorcycle performance on the racetrack, determining optimal operational limits

### Control Systems Engineering

BBA Consultants

May 2024 – Aug. 2024

Vancouver, BC

- Automated data organization in M-Files and Excel using **Python** scripts and **VBA** macros
- Tested and validated **RSLogix** ladder logic on **PLCs** for the Howe Sound Valmet Tailcutter project, ensuring accurate **sensor** integration and reliable **alarm control**
- Configured and commissioned a **PLC-based data logging** system for the Soo River Dam, enabling **real-time monitoring**

## PROJECTS AND RESEARCH

### Computer-Assisted Surgery for Mandibular Cancers | OpenCV, Python

Sep. 2024 – Present

- Developing **computer vision** algorithms with OpenCV to process images from **stereo cameras** for precise optical tracking
- Integrating the stereo vision system with **3D Slicer** software to support workflows of **computer-assisted surgery**
- Designing **custom markers** for improved tracking accuracy and embedding them into the code for real-time operation
- Writing software modules for **firmware integration**, optimizing **camera calibration**, and refining **communication protocols** between the cameras and surgical software

### FPGA Deep Neural Network Accelerator | C, ModelSim, Nios II, Quartus, SystemVerilog

Nov. 2024 - Dec. 2024

- Developed a hardware accelerator on FPGA to classify handwritten digit datasets with Q16.16 fixed-point arithmetic
- Optimized **PLLs**, **SDRAM** controllers, **memory copy** accelerators, and **dot product** accelerators to enhance computation
- Implemented **parallelized** data transfer between SDRAM and on-chip SRAM for efficient matrix-vector multiplications
- Visualize classification results with a **VGA display** driver, integrating hardware and software interfaces

### Transistor-Level State Machine Design | Cadence, Python, Quartus

Nov. 2024

- Designed a Moore-type **serial adder** using **TSPC DFFs**, achieving high-speed and low-power operation
- Optimized design using **transmission gate** XORs, **progressive sizing** transistors, and global reset for circuit functionality
- Balanced switching with optimized inverter ratios and improved critical path delays using **Elmore's delay principles**
- Simulated in Cadence and used Python to **compare delay and power trade-offs** across designs

### FPGA Digital Communication System with QPSK | MATLAB, ModelSim, Quartus, Simulink

May 2023 - Jun. 2023

- Developed a **real-time** QPSK modulator and demodulator along a raised cosine filtering to optimize **spectral efficiency**
- Described hardware for audio data transmission with FPGA-based **digital signal processing**
- Implemented **Hamming error correction**, ensuring a low bit error rate in noisy environments
- Optimized data transfer protocols between system components, ensuring latency below 25ms

## TECHNICAL SKILLS

**Programming:** ARM Assembly, C, C++, MATLAB, Python, SystemVerilog

**Embedded Systems:** STM32, Nios II, Quartus, ModelSim, RSLogix

**Development Tools:** Git, Linux, LVGL, OpenCV, Simulink, PyTorch, Pandas

**Hardware Design:** Altium, ASIC, Cadence, KiCad, LTspice, Oscilloscope, SCADA, VLSI

**Languages:** German, Japanese, Russian