Seiya Nozawa-Temchenko

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Education

University of British Columbia — Vancouver, BC
Bachelor of Applied Science in Electrical Engineering — *Sep. 2020 – Dec. 2025*
Current Coursework: *Analog CMOS IC, Computer Vision, Digital Systems Design, DSP and ISP, VLSI Systems*

Experience

Firmware Design — Jul. 2023 – Present
UBC ThunderBikes (University Design Team) — *Vancouver, BC*
- Developed firmware to read and decode CAN bus messages and write display outputs using the LVGL library on STM32
- Engineered a 100V battery pack for an electric motorcycle for the Formula Lightning Race 2024 in California
- Designed an STM32-based relay system to manage safe transitions between ignition, operation, and charging states, programmed in C
- Interfaced battery management system with the display over CAN bus, enabling real-time diagnostics and error handling
- Finalized PCB design with Altium, reviewing connections and soldering components for assembly

Control Systems — May 2024 – Aug. 2024
BBA Consultants — *Vancouver, BC*
- Designed wiring diagrams and schematics for BC Hydro's synchronous condenser projects at the Vancouver Island Terminal using BlueBeam and AutoCAD
- Programmed Python scripts and VBA Macros to automate organization in M-Files and Excel
- Tested RSLogix ladder logic on PLCs for Howe Sound's Valmet Tailcutter project, involving sensor and alarm control
- Configured and tested a data logger system on PLCs to be used for the Soo River Dam

Plant Engineering — Sep. 2023 – Apr. 2024
IKO Industries — *Ashcroft, BC*
- Automated repetitive tasks using Python, increasing efficiency by 3600% with scripts analyzing 4+ years of data
- Managed PLCs using RSLogix, integrating sensors, cameras, and lights
- Submitted mechanical design proposals using Autodesk Inventor to address worker safety and machinery efficiency
- Integrated two 20-ft Vertical Lift Modules by reviewing electrical and mechanical schematics and drawings
- Estimated material processing from quarry blasts using GPS coordinates in AutoCAD modeling

Projects

Computer Vision in Mandibular Cancer Surgery | *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 computer-assisted surgical workflows
- 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 ARC4 Decryption Circuit | *ModelSim, Quartus, SystemVerilog* — Oct. 2024
- Implemented an ARC4 decryption circuit with embedded SRAM (M10K) blocks for keys, ciphertext, and plaintext
- Developed brute-force ARC4 cracker capable of cycling through key space, validating keys by recognizing ASCII patterns
- Optimized cracking speed through parallel processing, using dual decryption cores to halve the search time
- Integrated ModelSim testbenches for RTL and post-synthesis simulations, ensuring accuracy

FPGA Communication Model to Reduce Noise | *ModelSim, Quartus, Simulink, SystemVerilog* — Jun. 2023
- Implemented a MatLab script to convert WAV files to MIF files, ensuring 16-bit sound fidelity
- Designed parallel Hamming encoders for error correction with XOR gates for codeword creation
- Integrated a QPSK modulator and demodulator with a raised cosine filter and matched filter, using MatLab-generated lookup tables for precise pulse generation and an AWGN

Technical Skills

Programming: ARM Assembly, C/C++, HTML/CSS/JS, LaTeX, MatLab, Python, RSLogix, SystemVerilog, VBA
Software Tools: GitHub, Linux, NumPy, OpenCV, Pandas, Simulink, TensorFlow
Electrical: ASIC, Altium, Cadence, FPGA, IC Design, KiCAD, Synopsis VCS, LTspice, ModelSim, Quartus, UVM, VLSI
Language Proficiency: German, Japanese, Russian