Chathil Rajamanthree Electrical Engineering Student

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TECHNICAL SKILLS

Software — SystemVerilog, VHDL, C, Embedded C, PicoBlaze, ARMv7/Assembly, Linux, Python, Bash/Shell scripting

Technologies — Quartus, ModelSim, Git, Altium, MS Office/Google suite

Laboratory — FPGA, MCU, Soldering, Function generator, Multimeter, Oscilloscope

EDUCATION

Bachelor of Applied Science - Electrical Engineering (Co-op), Sep 2023 – May 2028 | Vancouver, BC
University of British Columbia, CGPA: 80.8%
Relevant courses: Analog CMOS Integrated Circuit Design, Digital Systems Design, Signals and Systems

TECHNICAL WORK EXPERIENCE

Dialog Network Services, *Radio Network Planning Intern* Jul 2025 – Aug 2025 | Colombo, Sri Lanka
- Assisted deployment and reconfiguration of 2G/4G/5G base stations across urban and rural areas, with a focus on base station antenna interference mitigation to optimize network throughput to the end user
- Conducted drive tests with TEMS Investigation to assess antenna parameter effects on outdoor signal performance
- Performed indoor walk tests with G-NetTrack Pro to diagnose antenna complaints in existing buildings and verify signal coverage and quality in new building sites
- Proposed antenna upgrades for high-density public events, collaborating with external vendors to align solutions with technical antenna requirements

University of British Columbia, *Undergraduate Teaching Assistant* Jan 2025 – May 2025 | Vancouver, BC
- Offered individualized support to students in C programming and Arduino-based microcontroller development
- Debugged student code and piloted exam questions for APSC 160: Intro to Computation in Engineering Design

UBC Bionics, *Electrical Team Lead* Sep 2023 – Present | Vancouver, BC
- Collaborating in a multidisciplinary student design team to develop GRASP, a novel bionic arm with advanced haptic functionality
- Leading redesign of the BMS system to accommodate the addition of a USB-C PD Controller using Altium Designer to ease charging convenience in terms of accessibility and speed

PROJECTS

FPGA Digital Signal Processing, *UBC CPEN 311* Jun 2025
- Designed a digital communication system to enable hardware/software co-design in **SystemVerilog** and **embedded C** with the Nios II processor on the DE1-SoC to generate and view real-time ASK, BPSK and FSK modulation
- Integrated a Direct Digital Synthesis carrier signal generator and a 5-bit LFSR to modulate carrier waves with proper **clock domain crossing** techniques
- Synthesized FSK modulation using **embedded C** on the Nios II processor by generating interrupts using **Qsys** PIOs

FPGA Multi-Core RC4 Cracking Circuit, *UBC CPEN 311* Jun 2025
- Designed a **hardware-accelerated** brute-force attack on the RC4 stream cypher using 10 **parallel decryption cores** to achieve a 10x speedup over single-core cycling across a 24-bit keyspace
- Coordinated communication between 41 **finite state machines (FSMs)** using a standardised start-finish protocol with **SystemVerilog** and **VHDL**, validated using **SignalTap**

Proxmox Homelab Server, *Personal Project* May 2025 – Jul 2025
- Built a Proxmox-based virtualization environment hosting multiple **Linux** containers and virtual machines
- Automated game server deployment using custom **Bash scripts** with streamlined server management
- Deployed a Samba file server with a Tailscale VPN for secure remote file sharing across devices

Reduced Instruction Set Computer (RISC), *UBC CPEN 211* Nov 2024 – Dec 2024
- Devised a Turing-complete RISC processor with memory and I/O using **SystemVerilog** to execute programs written upon a set of 14 instructions, including branching and function calls similar to **ARMv7**
- Performed RTL-level and gate-level simulations using testbenches on **ModelSim** to verify functionality pre-synthesis and post-synthesis

Simple FPGA iPod, *UBC CPEN 311* May 2025
- Implemented multiple **glitchless FSMs** and a configurable clock divider to read from flash memory and control audio playback including real-time speed adjustments via a PS/2 keyboard
- Designed a 2-stage **synchronizer** to safely transfer signals across asynchronous clock domains
- Performed real-time averaging of audio samples using assembly and an **interrupt service routine (ISR)** on an embedded processor (**PicoBlaze**) to create an audio strength meter

Magnetic Field Detection Coin Picking Robot, *UBC ELEC 291* Mar 2025 – Apr 2025
- Developed a robot and remote for controlling, detecting and picking coins using the EFM8 and STM32 in **embedded C**
- Implemented **Colpitts Oscillator** to detect changes in the magnetic field for coin detection with 100% efficiency
- Designed a **tank circuit** to detect an AC current perimeter with 100% accuracy
- Programmed a **JDY-40 radio** to transmit commands from the remote to the robot and display data returned
- Isolated sensitive oscillator from noisy motor and servos using **optocouplers**