Nikola Zupancic

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Education

Queen's University Kingston, ON, Canada

Bachelor of Applied Science; Computer Engineering *September 2021 – April 2025*

- **Relevant coursework:** Computer Architecture, Data Structures, Algorithms, Object Oriented Programming, Microprocessors and Embedded Systems, Operating Systems, Computer Networks, Database Management Systems
- **Awards:** Dean's List 2022-2023

Experience

Queen's Space Engineering Team Member September 2023 - Current

- Working within the Onboard Computer (OBC) subteam on the **Queen's Space Engineering Team** to develop software for a **CubeSat**
- Participated in idea generation and the design process of the structure for the software that will run on the CubeSat
- Developped a driver for a Real Time Clock using the **i2c** protocol in **C++** on linux
- Currently working on interfacing an **STM32** with an external microSD card reader

Projects

GameBoy Emulator | https://github.com/c-ola/cassowary-gb June 2023 – Present

- Developed a program in **Rust** that **emulates** the 8-bit Gameboy desktop platforms
- Interpreted the Gameboy's **CISC** instruction set on emulated registers, memory and i/o devices
- Emulated **interrupts** generated by input and output hardware, including display, timer, serial and joypad interrupts
- Emulated a pixel processing unit that decodes bytes in VRAM into pixels that are displayed using **SDL2**

Customizable Assembler | https://github.com/c-ola/minisrc-assembler March 2024 - Present

- Wrote a **Python** program that assembles **assembly into machine code** given a description of an instruction set
- Used **YAML** and **JSON** to create a config format that allows for the description of **RISC** languages
- Developped support for tags, directives and comments, and windows and linux operating system executables

SBC Home Server July 2023 – Present

- Configured a rockpro64 to run **docker** on **debian** to host a NAS
- Used a VPN to allow for remote access from other networks

Patient Cancer Screening Service November 2023

- Achieved **2nd** place at the Queen's Engineering Competition for Programming
- Worked as a team of 4 to develop a service that could determine if a patient should be screened for cancer or not based on symptoms
- Wrote a frontend using **HTML, Tailwind CSS and React**
- Wrote a backend in **Python** using **Flask** to process a users symptoms through a Support Vector Machine to predict likelyhood of lung cancer

Academic Projects

Engineering Design Project January 2022 - April 2022

- Classified handwritten digits using ML algorithms **(CNN, KNN, SVM)** with an accuracy of 97%
- Created a GUI in python using TKinter to guess drawn handwritten digits using specified ML algorithms

Mechatronics Project Jan 2021 – Aug 2021

- Lead my group in designing a path finding rover for a University Course
- Wrote **C++** code for **Arduino** to path find, pick up a flag, and detect obstacles

Technical Skills

Languages: C/C++, Python, Rust, Java, Javascript, Verilog, Assembly, MATLAB, Bash, HTML, CSS, SQL
Libraries: SDL2, Raylib, React, Flask, OpenGL
DevOps: Git, Github/Gitlab, Docker
Tools: Linux, Cloudflare, Android SDK
Hardware: Arduino, FPGAs, Single Board Computers