Vaibhav Gogia

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Education

Bachelors of Computer Engineering CO-OP, *McMaster University* Sep 2019 – Apr 2024
4th-year Computer Engineering CO-OP Student Hamilton, ON
Dean's Honour List
Expected Graduation Date: April 2024

Technical Skills

- Languages: Python, C/C++, Java, Verilog
- Technologies: APIs, Computer Vision, JSON, 3D Printing
- Tools: GitHub, Quartus, ModelSim, Oscilloscopes

WORK EXPERIENCE

Platform and Tooling Engineer Co-op (LT), *AMD* May 2022 – Apr 2023
Markham, ON, Canada
- Product Security Office R&D (PHYSEC Canada Lab)
- Scripting to Automate the Lab's Database updates.
- Signal, Imaging & Fault Injections Security Analysis
- Computer Vision Libraries for Automation Routines
- GUI Programming for XYZ Gantry Automation
- Creating Tooling for EM and Optical Fault Injection Attacks.

Department Representative, *McMaster ECES* Aug 2020 – present
Hamilton, ON
- Organizing and executing various events throughout the year.
- Interacting and working with current and incoming students at McMaster.

Projects

Raspberry Pi Software-Defined Radio Jan 2022 – Apr 2022
- Software-Defined Radio implemented using C++
- Real-time optimization on a Raspberry Pi 4 with the NESDR RF hardware kit.
- Fully functional Mono and Stereo audio capabilities for multiple sampling and audio frequencies.
- Audio processing involving the use of finite impulse response generation, signal convolution with built-in resampling for sample rate conversion, phase-locked loops, multithreading with sync queues.
- RDS prcessing added clock and data recovery via peak identification.
- The key design constraint was to ensure the system ran in real-time without stuttering or cutting out on a computing platform with limited resources.

Cardiac Pacemaker Sep 2021 – Nov 2021
Developed a system that operates a Cardiac Pacemaker.
- Was responsible for developing and maintaining the Device Controller-Monitor (DCM) for a Pacemaker device.
- Used Java and Processing 3.5.4 with additional libraries like controlP5.*, processing.serial.* to develop the DCM interface.
- Worked with a group of 5 other team members to establish Serial-Communication and implement stateflows using Simulink

3D Spatial Mapping System Jan 2021 – Apr 2021
A microcontroller-based device that scans its surrounding.
- Developed a 3D visualization software using Python 3.8.8 scripting and various Python libraries such as MatPlotLib and NumPy to gather data in real-time and plot data points as a 3D visualization.
- Implemented serial communication through I2C protocols and UART.
- Successfully utilized an MSP432E401Y microcontroller and VL53L1X Time-of-Flight sensor to scan the device's surroundings within the YZ plane.

Hardware Image Decompression System Sep 2021 – Dec 2021
- Hardware image decompression system created using SystemVerilog in the Quartus Prime environment.
- Includes design and implementation of 6-tap finite impulse response filter for horizontal up-sampling, colourspace conversion operations from the YUV plane to the RGB plane, matrix multiplication operations, and use of embedded and external RAM units.

- Key design constraints included a finite number of hardware multipliers and external RAM units, a minimum operating clock frequency, and a minimum multiplier usage percentage.

Relevant Courses

Digital Systems Design, *McMaster University* Sep 2021 – Dec 2021

Data structures, Algorithms, and Discrete Maths, *McMaster University* Jan 2021 – Apr 2021

Principles of Programming, *McMaster University* Sep 2020 – Dec 2020

Engineering Computation, *McMaster University* Sep 2019 – Dec 2019

Software Development, *McMaster University* Sep 2021 – Dec 2021

Communication Systems, *McMaster University* Jan 2022 – Apr 2022

Microprocessor Systems, *McMaster University* Jan 2021 – Apr 2021

Logic Design, *McMaster University* Sep 2020 – Dec 2020

Circuits & Systems, *McMaster University* Jan 2021 – Apr 2021