Mark-Ryan Quinonez

Toronto, ON

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Education

St.Michael's College School | **Sep. 2015 – June 2019**
Ontario Secondary School Diploma | *Toronto, ON*

Toronto Metropolitan University | **Sep. 2019 – June 2023**
Bachelor of Engineering in Computer Engineering | *Toronto, ON*

Relevant Coursework

- Data Structures
- Digital Signal Processing
- Digital Systems Engineering
- Embedded Systems Design
- Intelligent Systems
- Digital Image Processing
- System-on-Chip Design
- Advanced Computer Architecture

Technical Skills

Languages: Python, Java, C, C++, C#, HTML/CSS, JavaScript, VHDL
Developer Tools: VS Code, Unity, Eclipse, MATLAB, Vivado, Quartus, Xilinx
Technologies/Frameworks: Linux, GitHub, FPGA, Embedded Systems, Signal Processing

Experience

The Learning Network | **December 2023 – Present**
XR Support | *Remote / Toronto, ON*

- Met with clients on-site to present their projects for feedback, as well as provide demonstrations for potential clients.
- Retrieved and repaired headsets that were not in working condition for clients to ensure usability for their provided application.

Projects

Capstone Project: System-on-Chip Design and Implementation for ECG Analysis | *Python, C++, VHDL, Vivado*

- Designed and implemented an ECG signal analysis system on an FPGA-based System-on-Programmable Chip (SoPC), utilizing skills in C++, VHDL, and hardware-software co-design.
- Implemented signal processing algorithms for ECG signal analysis, including beat detection and R-peak detection, and finding abnormalities.
- Utilized hardware acceleration techniques to increase processing speed and efficiency.
- Collaborated effectively within a team, demonstrating strong teamwork and communication abilities.

HPS/FPGA Based MD5 Decryption System-on-Chip | *C, VHDL, Quartus*

- Designed and implemented a custom MD5 decryption system using a HPS/FPGA platform, utilizing skills in VHDL, Avalon Memory Map (MM) interface, and C programming.
- Developed a serial implementation of the MD5 algorithm and integrated it into the system, with successful data and control assertions and transfers, demonstrating strong problem-solving and debugging skills.
- Leveraged the DE1 SoC (System-on-Chip) platform as the foundation for the HPS/FPGA-based MD5 decryption system, harnessing its integrated Cyclone V FPGA, ARM Cortex-A9, and wide range of peripherals.

Media Center on MCB1700 Board | *C, MCB1700, uVision IDE, RTOS*

- Designed and implemented a modular embedded media center using C on the MCB1700 ARM Cortex-M3 board, integrating an LCD display, joystick, LEDs, and USB peripherals through direct register-level programming and hardware abstraction.
- Developed multitasking functionality with state-machine logic to manage a graphical menu system, enabling real-time user interaction for photo viewing (BMP decoding), MP3 playback (audio streaming over UART or USB), and gameplay with input responsiveness.
- Applied embedded concepts including interrupt-driven I/O, peripheral driver development, memory-constrained programming, and user feedback systems (LEDs, screen updates) to build an interactive and responsive interface under tight hardware limitations.

Pong Recreation on an Embedded System | *C, Embedded Systems*

- Developed pong on an LPC1768 embedded system, featuring scoring system, controls, and game mechanics.
- Leveraged C programming and hardware skills to efficiently configure and utilize peripherals on the LPC1768 board, ensuring seamless playback and user interaction.
- Prioritized resource optimization to enhance system performance and responsiveness, taking into account memory management and power efficiency.