Bilal Dawood

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EDUCATION

University of Calgary — Calgary, AB
BSc in Electrical Engineering, Minor in Digital Engineering — GPA: 3.64 — *Aug. 2019 – May 2024*
Coursework and Certifications: Application Specific Processors and Accelerators, Digital Systems Design , Computer Organisation

EXPERIENCE

Digital Hardware Engineer (intern) — May 2022 – Aug 2023
Ericsson Canada Inc — *Ottawa, ON*
- Achieved 70% reduction in Thermal verification time by developing a test automation tool using Python.
- Ensured accuracy by creating test cases and comparing recorded metrics manually with component datasheets.
- Conducted board bring-up and verification by identifying and recording Flash SPI timing parameters using Oscilloscope.
- Confirmed data transfer compliance by identifying and recording Flash SPI interface timing parameters using Oscilloscope.
- Hands on experience with UART, JTAG, I2C and SPI with Ericsson radio boards.
- Power Rail Analysis using Power Tree and measuring continuity across capacitors to ensure no shorts were created.

Android SDK/NDK Full-Stack Developer (Intern) — Feb 2023 – Aug 2023
Ericsson Canada Inc. — *Ottawa, ON*
- Joined the development and optimization of an Android app using JavaScript, React Native, C++, and C; managed tasks with Jira; and ensured code quality through continuous debugging processes with Gerrit and peer reviews.
- Boosted backend data management efficiency by 60% by implementing 4 new classes and optimizing log outputs (Reduced unnecessary data logging and cleaned output formatting).
- Increased UI functionality by incorporating filters (date, blueprint name, indoor/outdoor, location).
- Reduced page load times by 90% by implementing infinite scrolling, showcasing expertise in software optimization.

PROJECTS

Automated Transit Enforcement | *Python, Git, Software Dev, Hardware Dev, OpenCV* — Sept 2023 – May 2024
- Developed a comprehensive hardware block diagram to outline the integration and use of various components.
- Reduced power consumption by 36% and memory utilization by 800% by implementing efficient triggers for sensors (LiDAR, GPS, camera) using a Python script on an RPi running Linux.
- Integrated hardware components with the software server, ensuring smooth data transfer and system operation.
- Conducted extensive testing to ensure system reliability and performance under various operational conditions.

Hardware Accelerator (Pynq-Z2 FPGA) | *C, Xilinx Vitis HLS, FPGA, Python* — Jan 2024 – May 2024
- Utilized AMD Xilinx Vitis High-Level-Synthesis (HLS) to develop a hardware accelerator on the PYNQ-Z2 FPGA using C.
- Achieved 13% time reduction by implementing hardware optimization techniques (loop unrolling/fission/pipelining) to improve hardware performance of MAC operations on FPGA.
- Conducted thorough testing and validation procedures using testbenches created in C as well as through C simulation and synthesis, to ensure functionality and performance of operations.
- Analyzed synthesis reports and utilized pragma directives to optimize loop latency, resource utilization and overall performance of hardware design.

Altera DE10-Lite Distance Sensor | *VHDL, Intel Quartus Prime, MODELSIM, FPGA* — Sept 2021 – Dec 2021
- Implemented voltage-to-distance conversion in VHDL using Intel Quartus Prime.
- Design and implementation met timing requirements for digital signal processing.
- Created testbenches to conduct tests and simulate digital signals and switch gates to be verified using MODELSIM.
- Configured DE10 display for distance/voltage based on switch state.
- Demonstrated proficiency in FPGA programming, sensor integration, and VHDL, highlighting skills in hardware design and testing.

TECHNICAL SKILLS

Languages: VHDL, Java, Python, C/C++, MATLAB, JavaScript, HTML/CSS, Assembly (ARM, MIPS)
Developer Tools: Git, Gerrit, Linux, PuTTy, MS Azure, VS Code, PyCharm, Jira
Design and Simulation: Xilinx Vivado, Intel Quartus Prime, Cadence Allegro, MODELSIM, NI Multisim. SIMULINK
Hardware Tools: Oscilloscope, Spectrum Analyzer, Multimeter, Solder, Power Supplies, STM MCU, Pynq Z2 FPGA, PIC MCU
Libraries: Pandas, NumPy, Matplotlib, Seaborn, Tkinter, Keras, OpenCV, Pillow, Scikit-learn

AWARDS

Jason Lang Scholarship(2020, 2021, 2023), **Dean's List**(2020, 2021, 2024)