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: Advanced SW Design and Development, Advanced Applied AI and ML, Industrial IoT Systems and Data Analytics

Experience

Systems Engineer and Researcher Sep 2023 – Present
University of Calgary *Calgary, AB*
- Led the design and development of an automated **Linux** based enforcement system for bus-only lanes, integrating hardware and ML model to enhance public safety and optimize transit operations.
- Achieved **36% reduction in power consumption** by embedded programming and sensor integration using **Python**.
- Read, decoded and utilized serial data from LiDAR sensor and GPS receiver using **Python**.
- Performed extensive **testing** to ensure system reliability and performance under various conditions.
- Regularly shared progress with Calgary Transit, explaining technical details in easy to understand manner, showcasing strong oral and written communication skills.
- Optimized YOLOv8 **object tracking model** through **pruning** and **quantization**, achieving **93% mAP** vehicle detection.

Digital Hardware Engineer (Intern) May 2022 – Aug 2023
Ericsson Canada Inc *Ottawa, ON*
- Achieved **70% reduction** in thermal verification time by developing an automation tool in **Python**.
- Ensured accuracy of automation tool by **debugging** and creating **test cases** and recording results using **Excel**.
- Delivered technical presentation to hardware teams, leading to successful company-wide tool adoption.

Android SDK/NDK Full-Stack Developer (Intern) Feb 2023 – Aug 2023
Ericsson Canada Inc. *Ottawa, ON*
- Developed and optimized an Android app using **JavaScript, React Native and C/C++**
- Managed tasks with Jira and ensured code quality through continuous debugging and peer reviews using Gerrit.
- Enhanced backend data management by **57%** for app by creating 4 new classes in **JS** and off-loading 80% of the data.
- Reduced page load times by **90%** by implementing **infinite scrolling**, showcasing expertise in software optimization.
- Collected and analyzed 5G performance metrics (throughput, error rate) contributing to app development.

Projects and Courses

Real-time Audio Filtering | *C, ARM Assembly, Cortext M4, Embedded Systems* Jan 2024 – May 2024
- Designed and optimized embedded **real-time audio filter** on the STM32F411 using **C and ARM Assembly**.
- Reduced filter sampling rate by **28**% and reduced program size by **13.6%** by utilizing **Assembly and buffers**.
- Analyzed **ARM assembly** to identify bottlenecks and **optimize code** efficiency, reducing instruction count.
- Utilized Direct Memory Access (DMA) to load audio files on MCU for data extraction and processing.
- Analyzed and compared performance (speed/memory usage) and verified filter integrity using Python Notebook.
- Implemented Loop Unrolling and utilized architecture-specific instructions to meet audio timing requirements.

Deep learning Finger Digit Classifier GUI | *Python, Machine Learning, GUI, Data Visualization* Jan 2022 – May 2022
- Developed a real-time finger digits classifier with fastAI and a CNN, achieving an **accuracy of 88%**.
- Proficiently managed image data and analyzed model performance for thorough evaluation and refinement.
- Created a GUI that accesses device camera to display live video and classification results.
- Employed **Seaborn** and **Matplotlib** for data visualization.

UnderPressure Posture Corrector | *C++, Embedded Systems, Agile, Product Development* Jan 2021 – May 2021
- Developed an Arduino-based posture corrector using an Arduino Nano, resistive strips, and a speaker.
- Applied voltage dividers and utilized C++ and Arduino IDE for embedded programming.
- Implemented **Agile project management methodologies** (sprint and scrum) for efficient development and teamwork.
- Received awards for "Most Innovative Product," "Best Marketing," and "Best Use of Humor."

Technical Skills

Hardware Tools: Thermocouple, Oscilloscope, Spectrum Analyzer, Multimeter, Solder, Power Supplies
Design and Simulation: Cadence Allegro, MODELSIM, NI Multisim, SOLIDWORKS, Intel Quartus Prime, SIMULINK
Languages: VHDL, Java, Python, C/C++, MATLAB, JavaScript, HTML/CSS, Assembly (ARM, MIPS)
Frameworks: React, Node.js, Flask, FastAPI, Tensorflow, PyTorch
Developer Tools: Git, Gerrit, Linux, PuTTy, MS Azure, VS Code, PyCharm, Jira
Libraries: Pandas, NumPy, Matplotlib, Seaborn, Tkinter, Keras, OpenCV, Pillow, Scikit-learn

Awards

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