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: Control Systems I, Cyber-Physical Systems Engineering, Power Systems Analysis

Experience

Systems Engineer and Researcher Sep 2023 – Present
University of Calgary *Calgary, AB*

- Led the design and development of a **Linux** based Automated Enforcement System (**AES**) for bus-only lanes, integrating hardware and ML model to enhance public safety and optimize transit operations.
- Developed a hardware **block diagram** for AES, outlining the integration and use of various components.
- Conducted **research** for component selection based on literature, electric ratings, and cost while ensuring functionality.
- 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**.

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**.
- Verified **signal integrity** and **timing compliance** of I/O operations on radio boards by utilizing **Cadence schematics**, sending commands via **PuTTY**, and recording **oscilloscope measurements**.
- Ensured **electrical functionality** by conducting **power rail analysis** on high voltage radio boards using **multimeter**.
- Hands-on experience with Ethernet, UART, JTAG, I2C and SPI protocols on Ericsson radio boards.
- Took initiative to update and fix faulty spectrum analyzer by working directly with hardware vendor.

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++**
- 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.

Projects and Courses

SolarCam | *Embedded Systems, Solar Powered, C++* Jan 2022 – May 2022

- Developed an **ESP32-microcontroller** based solar powered security camera.
- Designed a self-sustaining power system with solar charging, battery storage, and regulated voltage.
- Ensured adherence to relevant regulatory codes (ISO, CEC) for product quality, safety, and environmental considerations.

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."

Power Systems Analysis | *Power Flow, Stability, Control* Sep 2023 – Dec 2023

- Performed advanced power flow studies (decoupled/fast decoupled/DC) by utilizing Newton-Raphson methods for analysis.
- Investigated transient and voltage stability, and examined load frequency and voltage control of generators.
- Studied power generation economics (economic dispatch/cost curves) and modeled complex power systems using PSSE.
- Applied three-phase systems, per unit representation, and conducted power flow analysis using PowerWorld.

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 Native, Node.js, Flask, 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)