BILAL YOUSUF MOHAMMAD

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EDUCATION

McGill University Montreal, Canada
Bachelor of Engineering | Major: Electrical Engineering | Final Year GPA: 3.1 August 2015 – May 2020
Karachi Grammar School (2011 - 2015) Karachi, Pakistan

PROJECTS

Facial Recognition September 2019 - December 2019

- Developed a facial classification and recognition system in Python using OpenCV and machine learning libraries
- Calculated and compared the recognition rates of using Histogram of Gradients and Linear Binary Patterns to extract SIFT feature descriptors versus applying a Principal Component Analysis based approach

Discrete Audio Amplifier September 2019 - December 2019

- Designed, simulated, and validated a general-purpose operational amplifier by combining an active load differential stage, buffer stage, and class AB output stage
- Improved the stability of the circuit by performing frequency compensation and added a feedback loop by implementing a non-inverting configuration

Artificial Muscle Actuators September 2018 - April 2019

- Researched and designed helical dielectric elastomer actuators that temporarily change shape when a current is passed through it – thereby stimulating muscle movements
- Designed and built a multi-stage high voltage amplifier which altered the signal generated by an Android device to be compatible with the actuators

Microprocessors January 2019 - April 2019

- Manipulated the HAL drivers to configure an STM32 micro-controller unit to play user generated sounds by converting digital signals into analog and implementing a timer in C
- Utilized the HAL drivers to read, convert and display the temperature of the core of the STM32 board by implementing analog to digital conversion drivers in C

Musical Synthesizer September 2017 - December 2017

- Programmed an FPGA board to function as a musical synthesizer with additional I/O features using Assembly Language

RELEVANT COURSES TAKEN

Digital Logic

- Fundamentals of digital circuit design and optimization techniques along with practical experience programming an Altera FPGA board

Computer Organization

- Key computer structures and how processor hardware executes programs
- Programming ARM processors in Assembly Language using an FPGA board

Microprocessors

- Use of coprocessors and computer peripherals, such as SPI, I2C, I2S, SAI, USB, wireless standards, timers, DMA units and FLASH accelerators
- Interfacing and processing sensor data including multi-sensor integration

Communication Systems and Networks

- Signal modulation, transmission techniques, error detection and correction. Network protocols and internet applications, such as IP, TCP, P2P, DNS and HTTP

Numerical Methods

- Exploring mathematical models to solve complex systems through a numerical lens and employing such algorithms to tackle DSP and computer vision tasks

SKILLS AND INTERESTS

- **Programming:** Python, C, Java, Assembly Language, HTML, CSS, Latex, MATLAB
- **Equipment:** Teradyne FLEX Test System, STM32 ARM Cortex MCU, FPGA Board, NI ELVIS-II Workstation, Oscilloscope, Microscope
- **Software:** Simulink, LTSPICE, COMSOL, WordPress, LabVIEW, Wireshark, AutoCAD
- **Certifications:** WHIMS Lab Safety Training, Laser Safety Core Training
- **Work authorization:** Able to work in Canada without permission
- **Languages:** English (fluent), French (intermediate), and Urdu (fluent)
- **Interests:** Jazz guitar studies, web development, yoga, music theory, sustainability, electronics, and reading