AMIRAJ NIGAM

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SUMMARY

Actively looking for full-time opportunities in Embedded Firmware/Software, Hardware, Testing, and IoT and Machine learning to enhance my learning experience.

EDUCATION

M.S. Electrical Engineering (Embedded Systems)   **Aug 2019 - May 2021**

San Jose State University, California. (CGPA-3.4/4)

Relevant Coursework- Embedded Software Design, Embedded Hardware Design, Advance Computer Architecture, Embedded SoC Design, Internetworking, Digital Systems, Embedded, Data Structure and Algorithm

B. Tech Electrical Engineering   **July 2012 - June 2016**

Bharati Vidyapeeth Deemed to be University College of Engineering, Pune, India (Percentage-70%/100%)

TECHNICAL SKILLS

- **Programming Language:** C, C++, Embedded C, Python.
- **Protocols / Technologies:** SPI, I2C UART, CAN, PWM, ADC, GPIO, Interrupts
- **Network Protocols**: DNS, HTTP, SMTP, UDP, TCP/IP
- **OS Concepts:** Tasks, Queues, Semaphores, Mutex, Scheduling
- **Operating System:** FreeRTOS, Linux (Ubuntu), Windows
- **Tools/Framework:** Eagle CAD, MATLAB, Eclipse, GitHub, Qemu, Visual Studio.
- **Source Control/Debugging:** Gitlab, GitHub, Logic Analyzer, Digital Oscilloscope, Digital Multimeter
- **Processors/Platforms:** ARM-M Series, Atmel AVR(Atmega) family, STM32F4, Raspberry Pi 4, NXP LPC 4078

WORK EXPERIENCE

ARMADA AERONAUTICS INC, Santa Clara, CA, USA   **July '20 – Dec'20**

Firmware Software Engineering Intern (Embedded System)

- Designed and Developed ADC Voltage and Current drivers/Firmware for the Battery Management system.
- Developed Firmware for the soft start and controlled in-flight operation of UAV/Flying car.
- Developed SPI driver for real-time data transfer between BMS and CMS unit.
- Performed debugging, calibration, driver testing, and quality control.

POLYCAB INDIA LIMITED, Vadodara, India   **July '16 – July '19**

Technical Design Engineer(Power Engineering)

- Accountable for creation of BOM, Datasheets, Product Costing, Quality, Drawings, Manufacturing Design sheet, and providing back-end Technical support to the sales team and familiar with IEC, BS & IS standards.
- Design and Development of High Voltage, Low Voltage, Instrumentation, LAN, and control cable. Optimization of the product using "Cable Builder" software and assignment of the datasheet in Oracle ERP.

ACADEMIC PROJECTS

FreeRTOS Game Development (*C Programming Language* **|** Project Website **)**   **Aug '20 – Dec '20**

Hardware/Technologies Used*:* SJSU-2 development board (ARM Cortex -M4 based NXP LPC4078), 64 X 32 RGB Led Matrix, VS1053B Audio Decoder, PAM8403 Audio Amplifier, 2-Axis Joystick, FreeRTOS, EAGLE PCB, SPI, PWM, GPIO

- Designed a single-player 2-axis joystick and button-controlled based arcade game called Bubble Shooter in FreeRTOS. Used LPC4078 and interfaced it to RGB LED Matrix and audio decoder for in-game graphics and game sounds.
- Designed a PCB for power supply and connections with the SJ-2 board, RGB LED Matrix, and Audio Decoder.

Intelligent Assistance System for People with Visual Impairment (*C/C++* **|** Link **)**   **Oct '20 – Present**

Hardware/Technology: ESP32, Neo-6M GPS, SIM800L GPRS GSM, HC-SR04 Ultrasonic Sensor, UART, SPI, EAGLE PCB

- Developing a Smart Cane with real-time diagnostic reporting and alert notification capabilities during emergencies.

Stepper Motor Controller *(Python* | Link *)*   **Jan '20 – May '20**

Hardware/Technologies: Raspberry 3B, LSM303 Accelerometer, ADS 1105 ADC, Stepper Motor, I2C, Power Spectrum.

- Achieved stepper motor control by sampling the analog input from potentiometer using 12-bit ADC ADS 1105.
- Identified angular error feedback from actual and calculated values using LSM303 mounted on the stepper motor shaft to calculate the error and uses Nyquist sampling criteria and power spectrum analysis for verification.

Forward Error Correction *(C++* | Link*)*   **Aug '19 – Dec '19**

Hardware/Technologies: Emulated x86/ Arm A9 processors, KVM/QEMU Emulator, 5G/4G Polar Code, 4G/5G Turbo Code.

- Deployed the Turbo and Polar(5g) C and C++ code on x86 architecture and cross-compiled on the ARM A9 processor using a KVM/QEMU emulator and generated BER vs SNR and FER vs SNR data tables and curves.
- Calculated and analyzed the CPU performance and parameters for both the architecture.