

JATAN VIJAYKUMAR MANDALIYA

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OBJECTIVE

Graduate student in seeking Full time role for Hardware Engineer role, Offering strong experience in Hardware Development (PCB Design), low-level programming, embedded systems, RTOS, firmware-hardware co-design.

EXPERIENCE

Quantum Computing Inc

May 2025 – Aug 2025

Hardware Engineer Intern

Hoboken, NJ

- Developed and validated embedded hardware using NXP IMXRT MCU, achieving 10 MSPS real-time power measurement and system-level integration with parallel ADCs.
- Wrote low-level firmware in C/C++ to interface a parallel high-speed A/D converters, managing precise timers control, DMA, GPIO synchronization (FlexIO). Utilized JIRA for task tracking and Git for version control
- Designed front-end PCBA in Altium applying power integrity (PI), signal integrity (SI), and EMC/ESD principles. Collaborated on thermal management.

San Francisco State University

Jan 2025 – May 2025

Graduate Research Assistant

San Francisco, CA

- Automated SPICE/HSPICE simulations for distributed RC interconnects using Python. Built admittance-based reduced-order Pi models achieving <5% error vs. full RC trees.
- Validated models with HSPICE and implemented machine learning for higher-order delay modeling. Used Python for data parsing, plotting, and analysis.

Tirex Chargers

Jan 2024 – May 2024

Embedded Hardware Intern

Ahmedabad, India

- Designed PCB schematics and layouts in cadence Allegro for automotive EV charging ECUs integrating PCIe-based high-speed links (SerDes/PHY). Achieved 15% smaller board size. Synthesized circuits in PSpice.
- Executed EMC/ESD validation and PCBA bring-up, resolving 20+ design flaws (signal/power integrity, thermal). Improved stability by 20% using ATE like oscilloscopes, VNA, spectrum analyzer.
- Programmed firmware for sensor/actuator integration using UART, I2C, SPI, ADC, CAN on ARM Linux. Used MATLAB Simulink and ML to model Buck/Boost power converters with PI control achieving less than 5% noise.

SKILLS

- **Programming Language:** Embedded C, C, C++, Assembly, Python, Verilog, VHDL, System Verilog, TCL
- **Hardware:** Altium, LTSpice, Cadence Allegro, OrCAD CIS, MATLAB, Datasheet, PSpice, Keysight ADS.
- **Microcontrollers:** STM32L476, STM32G4, MSP430, 8086, Arduino, Teensy 4.1, ESP32/ESP8266, Raspberry PI
- **Communication Protocol:** UART, I2C, SPI, USB, CAN, RF (BLE, Wi-Fi), TCP/IP, UDP, Ethernet, PCIe, MQTT
- **Development Tools:** Quartus Prime, STMCube IDE, Spectrum Analyzer, Oscilloscope, Signal Generator, Jira, Git

PROJECTS

Custom RTOS on Microcontroller STM32L476 |

- Built ARM Cortex-M4 RTOS from scratch with SysTick-based task scheduling, context switching, synchronization, semaphores, interrupt handling, DMA, and memory optimization
- Designed priority-based pre-emptive scheduler supporting Round Robin, Cooperative, and Periodic scheduling. Integrated peripheral drivers and debugged using SWD.

IoT Gateway with ARM SoC, Ethernet, and Cellular Connectivity |

- Designed a PCB in Altium Designer integrating ARM Processor, Gigabit Ethernet, USB, PCIe and Mini-PCIe (for cellular)
- Implemented power architecture with DC/DC converters, LDOs, and transient protection ensuring stable voltage levels.
- Performed signal and power integrity simulations in Keysight ADS, validating USB, DDR and RGMII differential routing.
- Optimized EMI/ESD protection, grounding, and high-speed layout for manufacturability, generating Gerber and BOM.

EMG Based Cursor Control for Neural machine interface | [Link](#)

- Developed a real-time EMG-based cursor control, achieving sub-100ms latency and 90%+ accuracy for movement gestures using random forest classifier in Python and C++ firmware for signal acquisition.

EDUCATION

San Francisco State University, San Francisco, CA

May 2026 (Expected)

Master of Science, Electrical and Computer Engineering

GPA: 3.8 / 4.0

Courses: Embedded System, ASIC Design, Neural Machine Interface, Hardware for Machine Learning

Gujarat Technological University, Ahmedabad, India

May 2024

Bachelor of Engineering, Electronics and Communication

GPA: 3.76 / 4.0