M. TALMIZ UR REHMAN

Embedded Firmware Developer | Hardware Firmware Integration Specialist

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Summary

Embedded firmware engineer with 2 years of hands-on experience in firmware development and hardware integration, specializing in Qualcomm QCM6125 platform and advanced PCB design. Successfully led firmware development initiatives that enabled seamless integration of display, touch, and camera modules, and significantly improved reverse wireless charging performance through precise impedance tuning.

Experience

AIO APP Inc
Islamabad, Pakistan

Hardware Design Engineer
11/2023 - Present

- **Firmware Development— Quectel SC668S Platform:** Spearheaded firmware development on the Qualcomm QCM6125 processor, enabling seamless integration of various hardware modules. Focused on system-level coordination, stability, and feature optimization across the device architecture. Worked with QNavigator, QFlash, and QPST for module setup, firmware flashing.
- **Display, Touch & Camera Integration:** Led firmware bring-up and tuning for display, touch, and camera modules. Calibrated touch sensitivity, display brightness, and camera interfacing to ensure responsiveness and reliability across different usage scenarios.
- **Power Management, Fast Charging & Thermal Safety:** Integrated battery calibration logic and charging ICs with the Quectel SC668S SOM to support fast-charging protocols. Optimized reverse wireless charging through impedance tuning and firmware-based power control. Assessed thermal behavior and implemented safety features, including thermal cutoffs and automatic charge termination on overheating.
- **High-Speed Flex and Multilayer PCB Design:** Researched and designed high-speed flex and multilayer PCBs with optimized signal integrity for main-to-daughterboard and peripheral connections. Assessed EMI control, differential pair routing, and power delivery for reliable audio, display, and data performance. Developed flex interposers for early firmware testing on Quectel EVB.

AIO APP Inc
Shenzhen, China

International Engineering Visit—China
03/2025 - 04/2025

- **Optimized key peripherals** (display, touch, battery, speaker, MIC) for power, performance, and integration. Tuned display brightness vs. power draw, calibrated touch sensitivity, refined battery specs, verified speaker acoustic tuning, and implemented MIC noise cancellation with beam forming.
- **Led critical testing:** antenna tuning (2.4/5 GHz), FCC (EMI/EMC, ESD, OTA), vibration, drop, USB, and thermal profiling with 8-probe monitoring and firmware shutdown thresholds.
- **Oversaw SMT**: verified footprints, reflow soldering, X-ray, AOI, and dye testing for BGA parts. Flashed firmware, validated system functionality, manufactured and completed product shipment.

TeReSol Pvt. Ltd
Islamabad, Pakistan

Hardware Design Engineer
08/2023 - 11/2023

- Embedded design and development using C/C++
- Developed Bash/Shell Scripts for Process Automation
- Bug tracing and Fixing to enable a Functional Firmware
- Cloning and Flashing of customized Nvidia Tegra GPU cards

Education

COMSATS University Islamabad
Islamabad, Pakistan

Bachelor of Science Electrical (Computer) Engineering
09/2019 - 09/2023

Skills

Programming Languages: Embedded C, C++, Python, Bash/Shell, Verilog, ARM Assembly

Tools: Arduino, ESP32, Raspberry Pi, FPGA, QCM6125, Communication Protocols (I2c, SPI, UART)

Softwares: Altium, EasyEDA, Proteus, MATLAB, Embedded Linux, Ubuntu, RTOS, Git

Projects

Table Side AI Device
11/2023 - Present

Design and Development of Table Side AI Device

- Developed system firmware on **Quectel SC668S SOM**, integrating display, touch, and camera modules for real-time interaction.
- Implemented **battery management**, fast charging, and reverse wireless charging control logic.
- Designed **flex and multilayer high-speed PCBs** with signal integrity and EMI control.

Semi-Autonomous Object Tracking Sentry Robot (FYP)
08/2023 - 11/2023

Development of a semi-autonomous object tracking system

- Design and development of Detecting, Tracking and aiming system
- Improved tracking efficiency by integrating Raspberry PI units with Python for seamless operations
- Double Layer PCB Design and Fabrication

Image Convolution using FPGA
06/2022 - 09/2022

Image Convolution using FPGA

- Enhanced system efficiency by developing and implementing optimized algorithms using Verilog on Xilinx FPGA.
- Displayed original and resultant Image using VGA.

Line Following, Sumo and Obstacle Avoider Robot
06/2022 - 09/2022

Line Following, Sumo and Obstacle Avoider Robot

- Designed and Implemented Line Following, Sumo and Obstacle Avoider Robot using Arduino
- Improved user engagement by developing an interactive Sumo Robot app using MIT • Double Layer PCB as a chassis of Robot (LFR)

Awards

- **Microwiz Winner**
  Visospark '23 COMSATS
- **Leadership Excellence Award**
  IEEE SAC Leadership Dialogue 2022
- **Sumo Robot Winner**
  HI ROBO TEC, Taxila

Interests

- **Sports**
  Table Tennis, Badminton
- **Adventure**
  Traveling, Photography

Certification

Advanced Embedded Linux Development Specialization — Coursera

Internet of Things IOT, Robotics and Hacking with NodeMCU — Udemy

Mastering Linux: The Complete Guide to Becoming a Linux Pro — Udemy