Aditya Bhalerao

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My engineering experience has equipped me with strong Electrical engineering and Data science fundamentals with hands-on experience in PCB design , sensors, and embedded systems. I have 2 years of work experience including a year in a Research & Development lab leading a team as an electronics engineer for developing Quantum Technologies using PCB design Control systems, High speed digital design, FPGAs, and Analog circuit, along with a year working as an IoT product development intern using sensors.

EXPERIENCE & INTERNSHIPS

I-Hub Quantum Technology Foundation, Indian Institute of Science Education & Research Jun 2024 - May 2025

Research Fellow - Electronics engineer

- Accomplished high-speed Photodiode signal acquisition and FPGA-based control systems for laser frequency stabilization in THz for indigenous laser locking system reducing costs by around 90%.
- Accomplished full design cycle including researching, component selection, designing schematics & layouts, simulating, building, debugging and testing 4-layer PCBs for Photodiode Transimpedance amplifiers and low-noise dual-mode power supplies.
- Developed error-phase detection logic with FPGA Xilinx Z7 and STM32H753ZI using Verilog, Vitis HLS and C to calculate diode laser frequency and pursue laser locking reducing costs by 15%.
- Developed High-voltage piezo controllers/ actuators for controlling piezo stacks.
- Experience working with oscilloscopes, VNAs, function generators, DMMs, experience with Python for scripting & test automation.
- Worked with the team building a Calcium ion trap quantum computer, currently achieved 24 trapped Qubits.

Waterapp Technologies Pvt Ltd. Jul 2023 - Dec 2023

IoT Product development Intern

- Engineered a cost-effective loT-based water depth measurement prototype for monitoring water levels using Load cell principle with integrated GSM and RF considerations, and Li-Po and TP4056 linear charger used for rural and agro wells reducing costs by 20%.

Indian Meteorological Department (IMD) Oct 2023 - Jan 2024

ML Intern

- Developed ML python models for rainfall prediction using data observation techniques, contributing to more accurate weather predictions by analyzing meteorological datasets using gridded data and formats such as NETCDF and GRIB.

PROJECTS

Lifeguard AI - *Collaborative project with UC Berkeley | Pre seed | Electronics Lead*

- Developing a haptic feedback belt powered by NVIDIA Jetson Orin for real-time, on-device navigation & awareness achieving faster response than cloud-based systems by eliminating API latency through fully localized computation saving time by up to 80%
- Designing smart assistive glasses incorporating a camera, microphone, speaker, sensors, and Nordic nRF52 SoC to process video data and transmit semantic insights to the Jetson system for contextual feedback via the belt and audio interface.

Wearable smart ring - Prototype I

- Implemented a 2-layer FPCB for smart ring with Nordic nRF52832 BLE SoC, curved Li-Po arc, PPG and IMU functionalities.
- Designing newer models with NIR spectroscopic methods for blood glucose measurement (Non-invasive).
- Researched and conducted market surveys to analyze growth for sports, general health, and women's health modes .

Designing an ESP32 IoT 4-layer PCB

- Engineered a 4-layer IoT PCB featuring an ESP32, sensor interfaces, regulated power supply with user controls. Completed end-to-end design including schematic creation, PCB layout, and routing. Generated Gerbers and BOM for manufacturing.

Li-ion Battery charger and an IoT power supply subsystem

- Designed PCB using a DW01 battery protection circuit, undervoltage-lockout (UVLO), load sharing circuitry, battery charger, a 3.3v/5v 500mA boost/buck converter with a low quiescent current and a battery management system for LiPo battery.

EDUCATION

Btech, Electronics and Telecommunications engineering
College of Engineering, Pune (COEP)

Diploma, Data Science
Indian Institute of Technology (IIT), Madras

SKILLS

Analog circuit design, PCB Design, Sensors, Digital logic design, Power electronics, Electro-optics, Photonics, Data science, IoT Embedded systems, Signal processing, Communication protocols, LTspice, KiCad, TINA-TI, Proteus, NI LabVIEW, Altium, Ngspice Python, C, C++, Verilog, I2C, USB, SPI, UART, PCIe, SPICE, MATLAB, NodeMCU ESP8266, ESP 32 A1S, STM 32, Nordic nRF