

Fayyaz Nisar Shaikh

Kalyan, Maharashtra | fayyaz.nisar.shaikh@gmail.com | +91-8591686239 | LinkedIn | GitHub

SUMMARY

Embedded Systems & Firmware Engineer with 1.8+ years of experience in IoT, MedTech, and industrial automation. Proven expertise in developing production-ready firmware using C, ESP-IDF, and STM32CubeIDE. Technical core includes ESP32-S3, STM32 (F3/F4/H7), and NVIDIA Jetson Nano. Experienced across a wide range of communication protocols, including I2S, SPI, I2C, and Modbus (RTU/TCP) for scalable, high-performance systems.

EDUCATION

- Bharatiya Vidya Bhavan's Sardar Patel Institute of Technology (S.P.I.T.)**, Mumbai-58 *Aug 2024 – May 2027*
- B.Tech. in Electronics & Telecommunications Engineering
 - Multidisciplinary Minors in Computer Engineering
- Government Polytechnic Mumbai (G.P.M.)** *Sep 2021 – May 2024*
Grade: 91.42%
- Diploma in Electronics Engineering

PROFESSIONAL EXPERIENCE

- Embedded Systems Engineering Intern**, KAHANI TOYS *Sep 2025 – Present*
- Engineered 3+ audio applications on ESP32-S3 using MAX98357 I2S Audio Decoder for .wav & .mp3 playback.
 - Implemented **BLE+WiFi coexistence** for audio controls, SD card file management, and wireless MP3 streaming.
 - Improved Audio Quality by up to 90% by introducing **automatic mono/stereo** modes.
 - Ported **Helix MP3 Decoder** to ESP-IDF (Xtensa), adding SD card & SPIFFS mounting with custom partition table layout for efficient multi-format audio file handling.
- Embedded Firmware Intern**, VISO *May 2025 – Aug 2025*
- Engineered industrial automation firmware on **STM32F3/F4/H7**, integrating **24-bit ADC (MCP3564)** via SPI with **USB CDC** for live data acquisition, achieving an **RMSE < 5%**.
 - Built a 3-language (EN/ES/JP) speech-to-text pipeline on NVIDIA Jetson Nano using Vosk & Whisper. Achieved 95% accuracy with Modbus TCP for industrial control.
 - Integrated **Bluetooth Classic** on ESP32 for wireless speaker connectivity & interfaced **GPS module** for a **real-time bus navigation** system across **20+ locations in India**.
- Embedded Systems Developer Intern**, SMOWCODE *Dec 2023 – May 2024*
- Developed a **PID control library** on ESP-IDF for ESP32 maintaining **< 3% steady-state error**, and established a **C-to-graphical code bridge**, reducing development time by nearly **10x** and **accelerating** embedded firmware development.
 - Implemented UART communication firmware on **NXP S32K144**.
 - Designed **bit-banged software I2C & SPI** drivers on ESP-IDF, verified against hardware I2C/SPI output using a logic analyzer and achieved an efficiency of 90%.

PROJECTS

- Smart Hand Physiotherapy System (B.Tech Major Project)** *Jan 2026 – Present*
- Project associated with the Department of Electrical Engineering, **IIT Bombay**. Designing a smart hand physiotherapy system using IMU sensors with an RMSE < 5% to track real-time elbow & wrist movements for **rehabilitation** assessment.
- Smart Power Monitoring System** *Jan 2026 – Apr 2026*
- Calibrated 10-bit ADC of **PIC18F4550** achieving an RMSE < 5% to measure 0-250V AC, 0-70V DC, 0-5A AC/DC. Integrated INVT HMI Display with PIC18F4550 for Live Data Display & manipulated PWM Duty cycle via **Modbus(RS485)**.
- Gembot - Gemini Powered Voice Assistant Bot** *Dec 2025 – Jan 2026*
- Designed a **voice-controlled assistant bot** capable of real-time conversations. Leveraged GPU-based local audio processing to achieve a 70% reduction in latency.
- Scarlet Rover - Mini ADAS System** *Jul 2025 – Aug 2025*
- Built a mini ADAS rover (Adaptive Cruise Control, Collision & Lane Assist) using **MSP430FR5969** with Ultrasonic Sensor. Created an ESP32 based gesture-control car using **MPU6050** accelerometer via I2C communication.

TECHNICAL SKILLS

- **Software & Tools:** C, C++, Embedded C, MicroPython, RTOS, ESP-IDF, STM32CubeIDE, CCS (Code Composer Studio), MPLabX, Arduino IDE, Embedded Linux, GitHub.
- **Hardware & Protocols:** STM32F3/F4/H7, ESP32/S3, MSP430FR5969, PIC18F4550, NVIDIA Jetson Nano, BeagleY AI, UART, SPI, I2C, I2S, USB CDC, BLE, Bluetooth, WiFi, LoRa, Modbus RTU/TCP, RS485, Eagle CAD.

ACHIEVEMENTS

- **1st Prize Winner**, BugBuster 3.0 – 24-hour Hardware Hackathon
- **3rd Prize Winner**, Mini Project 2025, S.P.I.T. Mumbai.
- **Top 10 Finalist**, 24-hours Hardware Hackathons – BugBuster 2.0, Tech-A-Thon, Unplugged, & ColoHacks
- **Top 15 Finalist**, National Entrepreneurship Challenge (NEC 24-25), **IIT Bombay**.
- **1st Topper**, Electronics Department (Batch 2024), Government Polytechnic Mumbai.
- **Executive Head, IEEE Student Chapter**, S.P.I.T. : Organized 24 hour IoT Hardware Hackathon at S.P.I.T.