

MOHAMMAD NOROZIAN AZIZI

Embedded Systems and Electronics Engineer

CONTACT

+98 930 897 4255
mohammadnorozianazizi@gmail.com

EDUCATION

B.Sc. Biomedical Engineering
Bioelectric Engineering
Amirkabir University of Technology
Graduated 2022
GPA 16.52 / 20

EXPERIENCE

Current: independent
project work
Previously: WioTech R&D
3 years

PROJECT FOCUS

Embedded firmware
PCB and circuit design
Cellular and IP audio
Industrial control
Battery power systems

PORTFOLIO

lcnj.ir/about#portfolio
github.com/mnazizi

PROFILE

Embedded Systems and Electronics Engineer working independently on client projects. Develop embedded products across circuit and PCB design, STM32 and ESP32 firmware, communication interfaces, hardware bring-up, and diagnostic software. Project experience spans cellular audio, industrial control, battery power systems, and connected devices.

FEATURED EMBEDDED SYSTEM PROJECT

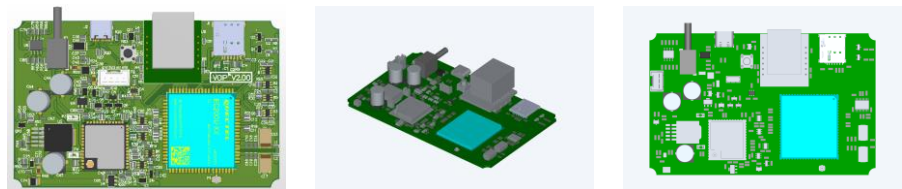
Cellular and IP Audio System

ESP32-S3 / EC200U / W5500 / ESP-IDF / Android

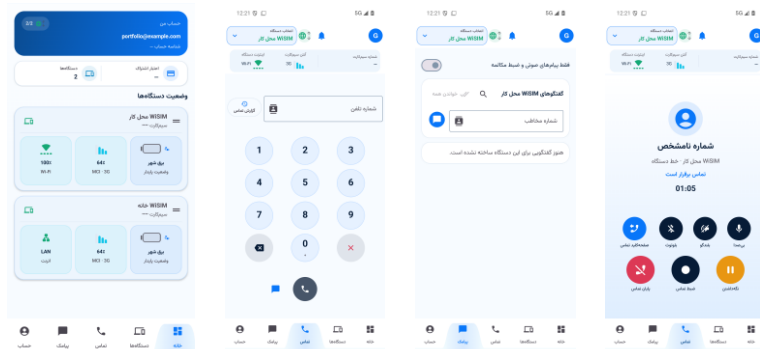
Designed custom board revisions integrating cellular, Wi-Fi, Ethernet, USB, OLED, power control and modem level translation. Developed call-state handling and bidirectional PCM/I2S audio, WebSocket and UDP transport, and G.711/Opus integration work.

Refactored Arduino firmware into ESP-IDF tasks and modules. Added queue and jitter-buffer diagnostics, reconnect handling, audio test modes and Python host tools for prototype investigation.

Developed the Android app with AI assistance using Kotlin and Jetpack Compose for multi-device control, calls and SMS. Personally developed the server communication protocols, data and message management, and telecommunications logic.



PCB CAD views: earlier V2.00 design and V2.01 perspective and top views



Android UI: device status, calls, messages and active call; demonstration data

AUDIO HARDWARE AND INDUSTRIAL CONTROL

SIP Audio Hardware

W5500 / PCM5102A / NS4165B / PoE / USB

Designed schematics and PCB hardware for Ethernet audio, including a DAC, speaker amplifier and embedded controller interfaces. Developed PoE and USB power circuits with source selection and reviewed component footprints.

GIFT Display Controller

ESP32-S3 / ILI9488 / 16-bit 8080 / USB-C

Designed a custom TFT controller board with a 16-bit parallel bus, control signals, series termination, backlight connections, dedicated display supplies, power switching, USB-C protection, button and buzzer interfaces.

Dual MCU Lock and Switching Controller

STM32F030 · ESP32-S3 · MPU6050 · UART · ESP-IDF · Embedded web UI

Developed separate STM32 and ESP32 firmware for actuator control, voltage sensing, motion monitoring, timing automation, and a browser-based control panel.

Implemented AES-CCM authenticated UART commands with replay rejection, persistent boot epochs, fault handling, and versioned release and integration-test records.

Added five-minute voltage history, time zoom, pause and review, and CSV export. Verified all 8,120 retained records, including 4,059 valid readings and explicitly marked unavailable slots, against the exported CSV.

Smart Car Wash Controller and IO Boards

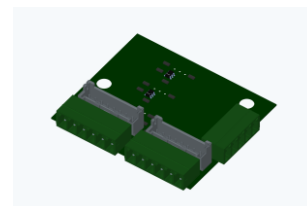
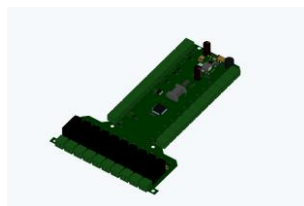
STM32G070 · ESP32 · FreeRTOS · UART and RS-485 · Altium

Designed a board family covering central control, field IO, and operator panels, with isolated inputs and relay outputs for industrial equipment.

Developed STM32 peripheral and communication integration using UART DMA, RTOS tasks, I2C, and CRC support; integrated environmental monitoring and ESP32 connectivity.



Car wash IO board: existing portfolio image



Controller, field IO and operator panel: renders from project STEP files

Four Channel LED PWM Controller

ESP32 · Arduino C++ · Wi-Fi web panel · NVS

Implemented four independent 5 kHz PWM outputs with programmable on and off intervals, brightness levels, and rise and fall transitions. Added a Persian web configuration panel and persistent settings.

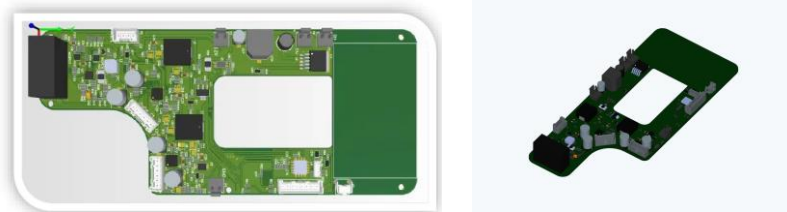
POWER, SENSING AND EMBEDDED CONTROLLERS

Multiport Power Bank and Charging Hardware

STM32F030 · USB-C · IP5356 and IP5385 · BQ24610 · Altium

Designed multiple power-bank hardware revisions covering battery charging, USB-C power interfaces, power conversion, switching, protection, and MCU supervision.

Worked on architectures using IP5356/IP5385 power-management devices and BQ24610 charging circuitry, including a 24 V hardware variant and associated STM32 project configurations.



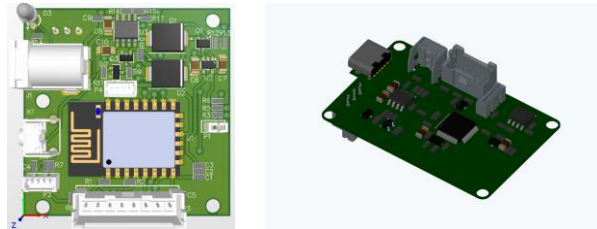
Power bank: previous CAD image and a render of the V1.1 STEP model

Temperature Monitoring and Embedded Interfaces

STM32 · Wireless modules · OLED and TFT · Altium

Designed hardware variants for wireless temperature logging and BLE modules. Worked on STM32 warmer-controller and display interfaces with temperature and time settings and sensor or overtemperature error states.

Developed additional circuit and interface designs for embedded power, relay cards with two to five channels, and STM32-based operator interfaces.



Temperature logger: previous PCB view and Bluetooth hardware STEP model

Gate and Jack Controller

STM32F103 · FreeRTOS · RF input · Keypad · OLED · EEPROM

Developed the embedded control structure for a dual-motor gate system, with motor-control tasks, open and close states, keypad and remote input, display support, and persistent settings interfaces.

Motion Sensing and BLE Air Mouse

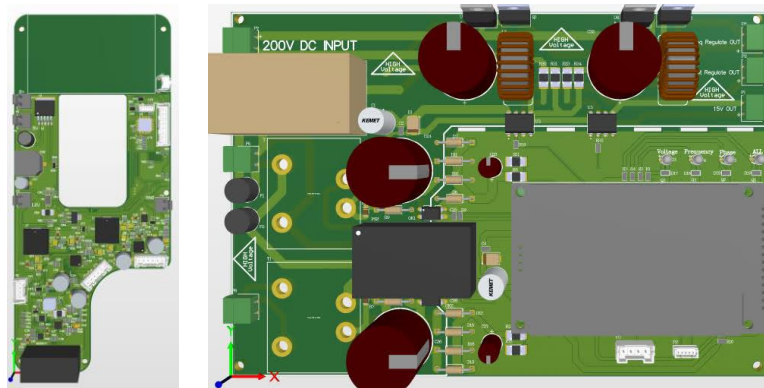
ESP32-S3 · MPU6050 · BLE HID · ESP-IDF · Python

Implemented inertial sensor acquisition, BLE HID pointer output, calibration, stored screen mapping, and recovery after temporary I2C sensor disconnection.

Built a Windows sensor dashboard with live plots and CSV capture. A saved hardware test recorded 600 samples at 50 Hz, with BLE connected throughout and 599 HID reports.

ADDITIONAL EMBEDDED HARDWARE PORTFOLIO

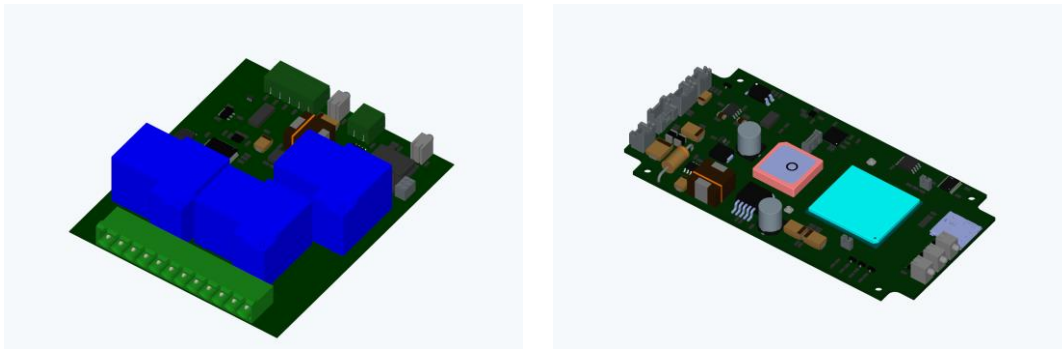
Additional PCB Design Portfolio



Battery-power and power-conversion PCB designs

WioSmart and WioFind Hardware Portfolio

Embedded electronics hardware designs from my previous WioTech collaboration, illustrated with the corresponding project STEP models.



WioSmart I4 / WioFind T1

PROJECT DEMONSTRATED SKILLS

Firmware: C/C++, STM32 HAL, ESP-IDF, Arduino, FreeRTOS, RTOS tasks and queues, interrupts, DMA, ADC, timers, PWM, persistent settings, firmware updates.

Hardware: Altium Designer, schematics and PCB layout, component selection and footprints, power conversion and charging, protection, level shifting, Ethernet and audio interfaces.

Connectivity: UART, SPI, I2C, RS-485, PCM/I2S, Wi-Fi, BLE HID, cellular modems, TCP/UDP, WebSocket.

Engineering tools: Python diagnostics, CSV capture, serial logging, test reports, source and release organization.

Mobile: AI-assisted Android development, Kotlin, Jetpack Compose; personally developed server protocols, data and telecommunications logic.