Nizam Elahi

0316-4917857
nizamelahi@gmail.com
Lahore, pakistan

I am an embedded system engineer.I have been developing and implementing custom mechatronics solutions since 2016.I also handle software development for all of my projects in C++,React Native and Python. Since 2019, I have been developing automation solutions,targeting low cost alternatives to current industry standards by leveraging existing mass production.

Skills

Circuit schematic design, debugging and simulation, PCB design ,µC networking(WIFI,UART), Designing for FDM printing, C++, Python, React native, openCV, PLC ladder logic design, CAD, AI

Experience

2019 - PRESENT

NE automation systems, Lahore,pakistan - Embedded system engineer

I have designed and implemented the following systems for the company's swing gate automation system:

- Cost optimized single side PCB with surface mount and through hole components targeting local market component availability.
- 10A MOSFET switched, bi-directional motor driver circuits with shunt based current feedback.
- 6S Li-ion battery packs with charging and protection circuits.
- FreeRTOS based multithreaded firmware for esp32 (C++).
- Firmware features:
  - Single button operation.
  - Motor timeout.
  - Auto-locking.
  - Current limiting/crush protection.
  - Wifi access point.
  - Sensor polling.
  - Web server with interface(HTML) for operation/config.
  - Communication over wifi with slave module.
- Smartphone apps for IOS & android(written in React Native):
  - Auto connection/disconnection to device wifi AP.
  - Device operation.
  - Device password management.
  - Encrypted password storage

Accelerated wear testing and battery cycle testing has been completed. Currently completing final assembly for the public release of the first batch.

2020-2021

Project lead on award winning AI based autonomous car

1st place DICE mega innovation 2022,
2nd place SOFTEC software engineering competition 2021

The project's objective was to modify an old SUV to make it capable of self driving. I designed and implemented the following systems:

- Custom PCB for 5 motor drivers(10A each), sensor interface and sensor power supply and distribution.
- 3d printed custom servos with magnetic encoders
- AI vision (Liteseg darknet) based autonomous car guidance system for steering and acceleration/braking written in python. Multithreaded for latency improvement.
- Microcontroller firmware(C++) for closed loop control of all servos and automatic gear shifting based on rpm.
- Google collab used to train AI model
- UART communication between different modules

Education

2017-2021

FAST-NU, Lahore - BS Electrical Engineering(electronics)

2009-2015
Pakistan International school, Buraidah - A levels, O levels

2005-2008
LACAS, Johar Town, Lahore

Awards

2nd place SOFTEC software engineering competition 2021

1st place DICE mega innovation 2022

1st place FYP display 2021 FAST-NU

Hardware Experience

- esp32 & 8266
- arduino(mega and uno)
- raspberry pi
- 8052
- UART debugging
- MOSFET driver design for custom high current H bridge applications

Software Experience

- languages(C++,python,React Native)
- VS code and platform IO
- Autodesk eagle
- Easy EDA
- Solidworks
- fusion 360
- Proteus
- MATLAB
- Android Studio

Project portfolio

- Level 3 autonomous car (retrofitted 1989 SUV)
- Swing gate automation system with wifi connectivity
- Remote system start via web interface for older cars/generators
- Custom multiplexed displays
- Project Portfolio Link