

Akhil Joseph

Embedded Engineer

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github.com/akhiljoseph | fabacademy.org/2019/labs/kochi/students/akhil-joseph/



Embedded Engineer and Digital Fabrication Expert with thorough experience in product design and prototyping with various Development architectures. Experience in Firmware and custom library development. Passionate maker with Startup experiences. With dedication, I learned the necessary skills by myself to complete many consumer and enterprise applications for clients across the world. I am looking forward to be part of a wonderful team and use my skills to build some great products or services that creates my mark in the world.

Education

Diploma in DIGITAL FABRICATION

2019 - 2020

[FABLAB Kochi](#)

- Acquired expertise in advanced digital fabrication methodologies through Fab Academy, a globally renowned distributed educational model.
- Engaged in a comprehensive curriculum aligned with MIT's rapid prototyping course "How To Make (Almost) Anything," covering diverse topics such as computer-aided design (CAD), computer-controlled cutting, electronics production, 3D scanning and printing, computer-controlled machining, and embedded programming.
- Applied theoretical knowledge through practical assignments, gaining proficiency in utilizing digital fabrication tools and technologies effectively.
- Demonstrated practical skills and innovation by successfully completing a final project, showcasing the integration of acquired knowledge and personal creativity.
- Earned certification endorsed by the Fab Foundation, affirming proficiency in digital fabrication methodologies and technologies.

project:

- Flute playing machine

B.Tech Electronics & Communication Engineering

2012 - 2016

[S.N.M.I.M.T Malinkara](#)

(course completed with 4 backlogs)

Project :

- Mini project: Smart Gas Stove (2014)
- Main project : 3D-printer (2015)

Professional Experience

Head of Engineering

2022 - present

[Triaxia Infotech Pvt Ltd](#)

- Successfully led both the hardware and software departments at Triaxia Infotech Pvt Ltd, overseeing the development and delivery of innovative solutions.
- Conducted daily meetings with developers to ensure effective communication, collaboration, and progress tracking.
- Developed a Django Rest Framework-based backend for a restaurant management application, enabling seamless operations and enhancing customer experience.
- Utilized Jenkins for continuous integration and deployment, streamlining the development process and ensuring efficient delivery of software solutions.

Skills

Hardware



MSP430, GSM, Quectel OpenCPU, XMEGA, PIC, STM32, ESP32

PCB Design



Proteus, FAB3000

Industrial Electronics



PLC programing (Delta DVP14SS2), HMI (Delta DOP-B03E211), DELTA VFD

3D-Design



AUTODESK INVENTOR

Databases



Firebase, PostgreSQL

Server



NGINX, APACHE, Mosquito MQTT

WEB Development



HTML, Django

Languages & frameworks

C



C++



RTOS



FreeRTOS, OpenCPU

- Planned and implemented database structure for the restaurant management app, optimising data storage and retrieval for enhanced performance.
- Successfully deployed the Firestbox project, a gated community shopping app, ensuring smooth operations.
- Led the completion of the Kochi Metro musical stairs project, delivering an engaging and interactive experience for commuters.
- Deployed the Me2u dating app, facilitating connections and relationships between users in a user-friendly and secure environment.
- Provided continuous server support for the Firstbox and other projects, ensuring high availability and reliability of services.

PYTHON



DJANGO, REST

GOLANG



HIKVISION ISAPI

Skills

Autodesk Inventor



JIRA



Jenkins



Microsoft Office



Adobe Photoshop



Project Associate

2021 - 2022

Triaxia Infotech Pvt Ltd

- Django REST framework based backend for Gated Community shopping
- Digitalocean server, nginx management
- github actions, CI-CD

Technical consultant

2020 - 2021

Triaxia Infotech Pvt Ltd

- Adlanzer, Django REST framework based Advertisement system
- Adlanzer database and api design

Lead Embedded Engineer

2018 - 2019

Technorip Innovations Pvt Ltd

- Led the development of a low-power tracking solution for high-value asset management using Quectel Open CPU hardware, resulting in improved efficiency and cost savings.
- Developed I2C and UART driver libraries for SSD1306 OLED display and GT511c3 respectively, enhancing the functionality and usability of the fingerprint-based HR management solution.
- Implemented TCP socket communication in Quectel Open CPU architecture (Nucleus RTOS) for seamless integration and data transfer in the HR management solution.
- Designed and developed a low-cost and low-power cellular tracking device with up to 30 days of backup for consignment tracking, successfully completing the pilot run in April 2018.
- Assembled PCBs for GSM/GPRS Tracker and fingerprint-based HR management solution, ensuring adherence to design for manufacturability (DFM) principles.
- Maintained clear and concise documentation throughout the development process, facilitating ease of understanding and knowledge transfer among team members.
- Collaborated with cross-functional teams to ensure the successful implementation and integration of hardware and software components.
- Conducted rigorous testing and debugging of code and hardware, swiftly identifying and resolving issues to ensure optimal performance and reliability.

Support Embedded Engineer (part-time)

2018 - 8 months

Inspirein Technologies Pvt Ltd

- Provided part-time support as an Embedded Engineer at Inspirein Technologies Pvt Ltd, specializing in AIS140 GPS-GPRS tracker development.
- Designed and implemented software solutions using PIC16F microcontroller, M95 GSM modem, and Quectel L86 GPS Module, ensuring accurate and reliable tracking capabilities.
- Developed an ignition detection feature, enabling real-time monitoring vehicle operations.
- Implemented SOS support functionality, enabling users to send distress signals in emergency situations.
- Collaborated with cross-functional teams to ensure seamless integration of the AIS140 GPS-GPRS tracker.

Embedded Engineer

2015 - 2017

Technorip Innovations

- Quectal M66 Firmware development
- Tracking Devices Research & Development

Internship (part-time)

2014 - 2015

Technorip Innovations

- Learn Embedded programming and PCB designing
- Learn RTOS, Python

Community Engagement & Mentorship Initiatives

MENTOR Tink-Her Hack hackathon

2024 - 2 days

CHRIST COLLAGE

Entrepreneurial Talk & Student Dashboard Launch

2023 - 1 day

S.N.M.I.M.T

MENTOR Agri Tech HACKATHON

2022 - 2 days

CPCRI

Pi Jam Speaker at Raspberry Pi , Kochi 2019

2019 - 1 day

cellular IOT

Arduino Day speaker at FSDC, FISAT collage

2019 - 1 day

IOT & MQTT protocol

Speaker at CISCO Thingbator

2019 - 1 days

Cellular IOT & GSM Firmware development

Mentor Hackathon CISCO thingqbator

2019 - 3 day

Amrita Vishwa Vidyapeetham

Projects

Nautilus Gear Art

2024

IBS software

- A simple Nautilus gear using Multi wood
- Gear will complete n rotations when we just crank by hand
- Through beam Limits switch to sense hand cranking
- Multi Wood cut using water jet in FABLAB kochi
- Gear designed in Autodesk Inventor

Music Visualiser Art Wall

2024

IBS software

- Ws2811 based music Art wall
- This Wall visualise the music wave
- 960 leds on 6x6 feet size form board
- Frame fabricated using Aluminium extrusions
- colors can be customisable via mobile app

OT Scrub sink 2024

Aster Medcity

- Designed a custom PCB circuit for an existing scrub sink in a hospital operating theater, incorporating a foot pedal-based system for water control during surgeon handwashing.
- Developed an analog-based design to ensure long-lasting performance and reliability of the circuit.
- Collaborated closely with the hospital staff to understand their specific requirements and ensure the design met their needs effectively.
- Implemented a two-foot pedal design, with one pedal turning on the water and the other turning it off, providing a convenient and hygienic solution for surgeons.

PIPE bending machine 2024

Plantme Agro

- Designed and developed a custom pipe bending machine for Plantme Agro, incorporating delta PLC, delta VFD, delta HMI, and an optical encoder.
- Successfully implemented a machine capable of bending pipes at any angle between 0 to 360 degrees, with the angle set by the HMI interface.
- Collaborated closely with the client to understand their specific requirements and ensure the machine met their needs effectively.

Radiation monitoring device 2023

B.A.R.C

- Contributed to the development of a specialised radiation monitoring device for Bhabha Atomic Research Centre (BARC).
- Collaborated with a team of scientists and engineers to design hardware and software, ensuring the device adhered to stringent quality and safety standards.
- Due to non-disclosure agreements, specific project details are confidential.

Musical Stairs 2023

LULU mall Kochi

- Through beam Photo sensor based sensing
- Eadu music notes
- implement this on LULU mall for 2 weeks event

Home LIFT 2023

Leva Home Lifts Pvt Ltd

- Delta PLC program for Home Lift
- obstacle sensing to prevent collision
- Hydraulic based Accuation

Musical Staircase 2021

Kochi Metro

- First Musical Stairs in kerala
- Through beam photo sensor based Sensing
- Music nots can be customise
- Raspberry PI as Controler
- Implement this on MG road metro station for 2 months

Custom Treadmill 2020

Karunya physiotherapy clinic

- Provided technical consultation and expertise to Karunya Physiotherapy Clinic
- custom medical treadmill stroke patients.
- variable speed control, forward/reverse motion, and custom timers.
- RS485-based communication

- custom control board with an OLED display
- Collaborated closely with physiotherapists and medical professionals to ensure the design and functionality of the treadmill met the specific needs of stroke patients.

Asset tracking 2019

Muthoot

- A tracker with BLE
- GPS, GSM are in OFF state
- Tracker communicate to local hub periodically
- When the tracker exit from wireless range, GPS, GSM activated and send live location to server
- Successfully demonstrated this POC to Muthoot management when I work in Technorip

Handcuff tracking 2019

Kerala police

- A tracker with GSM,BLE and GPS
- Tracker normally connect to mobile app via BLE
- When tracker exit from BLE Range, GSM, GPS will turn on and send live data to server
- wireless charging
- successfully demonstrated this to cyberdog kerala when I work in Technorip

GSM (DTMF & IVR) Based 3-phase Water pump Control 2018

Yescollages Infotech Pvt . Ltd.

Asset Tracking 2018

Pikkol

- Cellular based Tracking
- Quectel M66 GSM modem
- 30 days backup
- OpenCPU based custom firmware
- tracker updates its cellular location in every 30 min and turn off automatically to save power
- consume less than 1 micro amp in off state
- Design this board in Proteus, then assembled in Makervillage using assembly line
- make custom stencils for solder paste printing and pin and place

Industrial grade 3D-printer 2017

Yescollages Infotech Pvt . Ltd.

Electronic Voting Machine 2015

S.N.M.I.M.T

- Developed a custom electronic voting machine for college management elections, utilizing microcontrollers and EPROM.
- Designed and implemented a secure and efficient data storage system within the voting machine, ensuring accurate and reliable election results.
- Maintained clear and effective communication with college management, explaining technical concepts in a manner easily understood by non-technical staff.

Personal Projects

HIKVISION ISAPI SMART LIGHT 2023

iTouch Smart Home

- Light will ON based Camera motion events Event
- Line crossing, motion sensing, region entrance, region exit, intrusion detection

- Different operations can be configured for different events
- Hikvision ISAPI based Event Stream
- HomeAssistant Integration

WATER LEVEL CONTROLLER

2022

iTouch Smart Home

- water level controller with Level indication
- Dry run protection
- Ac sensing
- Auto retry after dry run
- Options to switch induction motor and BLDC according to Solar availability

TOUCH SWITCH with WiFi

2022

iTouch Smart Home

- Ttp223 based touch switch with wifi
- Alexa automation
- custom PCB with Esp32
- MQTT communication
- google home, Alexa, apple home integration
- can integrate to HIKVISION Camera via Homeassistant

GATE AUTOMATION

2021

iTouch Smart Home

- Roller based Gate Automation
- 24v DC motor
- smartelex PWM controller
- Magnetic Reed switch for open LIMIT
- Over Current Sensing
- 433mhz remote with rolling code
- Integrated to Hikvision app

1KW Solar Off-Grid Plant

2020

iTouch Smart Home

- Ashapower Neon 60 MPPT
- Custom Assembled Sinewave inverter (2018)
- 2 Scrap Solar Panels from market (330w poly)
- Auto switching GRID-SOLAR and vice versa

SINE-WAVE SMART INVERTER

2018

iTouch Smart Home

- Design Acrylic Transparent cover for inverter
- K-Board based Sinewave inverter
- Add options to turnoff grid charging