### SUMMARY

* Over 12 years of experience in conceptualizing and developing embedded products and solutions.
* Versatile skill set in Embedded C, Embedded communication protocols, IoT protocols, and post-silicon validation.
* Skilled in creating IoT applications for RF, BLE, ZigBee, GSM, GPS, and NB-IoT.
* Expertise in real-time implementations on 8/16/32-bit microcontroller platforms, with strong proficiency in C and Python.
* Extensive experience in board bring-up, porting operating systems to different development boards, and understanding of the Software Development Life Cycle.
* Hands-on experience in reverse engineering and analyzing embedded software and protocols.
* Skilled in utilizing network, logic analyzers, and oscilloscopes for testing and debugging.
* Experienced in designing and architecting scalable, high-performing, and cost-effective IoT platform software components.
* Ability to translate business requirements into technology requirements and coordinate with client teams for deployment, enhancement, or testing.
* Proficiency in configuring Git with Jenkins and scheduling jobs, with a solid background in DevOps practices.
* Experience in hardware design and PCB designing using various tools, with familiarity in reading and understanding electrical schematics, datasheets, and PCBA.
* Proven track record of managing teams across multiple geographies.
* Strong ability to debug embedded software systems effectively.
* Well-equipped to work on current and future projects related to firmware development and testing, with a commitment to delivering high-quality solutions.

### SKILLS

**Languages:** C, Embedded C, Python, Assembly

**Platforms:** Windows (XP/7/10/11), Linux (Ubuntu, Raspbian, Debian)

**Cloud Platform:** Amazon Web Services (AWS), Google Could Platform (GCP)

**IoT Application Protocols:** MQTT, CoAP, HTTP, JSON

**IoT Link protocols:** GSM, NBIoT, WIFI, GPS, Classic Bluetooth, ZigBee, NFC, and BLE(4.0, 4.2, 5.0, 5.2)

**IoT NW & Trans Protocols:** TCP/IP, UDP, SSL

**RTOS:** Free RTOS, ThreadX, Contiki, OpenWrt

**Embedded Protocols:** UART, SPI, I2C, MODBUS, RS485, QSPI, OSPI,CAN

**Compilers/Editors:** IAR -ARM, Kiel IDE, Code composer studio, AVR Studio, MPLAB X IDE, Eclipse, VSCode, Segger Embedded Studio, GCC

**Debugger** – JTAG Lauterbach (T32), Segger JLINK, Atmel-ICE

**PCB Design Tools:** Eagle, Ki cad, OrCAD, Altium, MS Visio

**Microcontrollers/DSP:**Qualcomm: Internal Intel: Internal

TI – MSP430F6137, cc2538, NXP – LPC2148, LPC2138, ATMEL – AT89C51 ST Micro – STM32, Cypress – CY8CKIT-0402-BLE, Cypress Touch Switches, Nordic -NRF52(BLE), Microchip – AtXmega128, ATSAML21, ATSAMD51, Quectel: BG96, BG95, BG951A

**Sensors:** ECG, Temperature, Heart Rate, Humidity, Accelerometer, Gyro, Inertial, pressure, proximity, resistive, capacitive touch, Light, Flux, Environmental, Air Quality (PM2.5, PM10), CO2, VOC, Occupancy

**Output:** Displays, Relays

**Testing Tools:** Multimeter, Function Generator, Oscilloscope, and Logic Analyzer

**Frameworks:** Django

**Libraries**: NumPy, Pandas, Matplotlib, Seaborn

**Version Control Tools:** GitHub, GitLab, Bit bucket, Confluence

**DevOps Tools**: Jenkins**,** Jira

**Methods**: Agile, Waterfall

### WORK EXPERIENCE

Senior Software Engineer (Sep 2022 to October 2023) - Susash Consulting Services LLC

Client: Caterpillar Inc (Mossville, IL)

* Working with Machine software feature development team.
* Organization of individual subsystem diagrams and software libraries for integration, Machine software library development.
* Integration of software features taken from models and libraries to create software flash files, Integration of configuration and calibration data.
* Test plan development and software validation, Support, and communication of software releases, including documentation required by field follow and/or customers for successfully updating software, wiring and components.
* Identification and resolution of software defects, and proper issue list submissions and management
* Participating in Software reviews

Lead-II Embedded Software (Mar 2021 to July 2022) - UST Global, Bangalore

* Developed firmware applications for Smart Lighting Controllers utilizing various NBIoT and ZigBee communication modules.
* Designed and implemented applications tailored for certifications specific to carriers and regions.
* Modified firmware configurations to enhance product performance and incorporate new features.
* Coordinated investigations and bug fixes in collaboration with other software engineering team members.
* Collaborated with software and QA engineers to conduct thorough testing and implement improvements.
* Played a key role in recruiting, onboarding, training, and assigning projects to software team members.
* Provided guidance to a team of 3 individuals in migrating legacy products to updated versions.
* Evaluated new technology platforms to assess feasibility and validate their suitability for new products.
* Maintained communication with technical vendors throughout the product development process.

Senior Firmware Engineer (Dec 2019 – Jan 2021)- 75F, Bangalore

* Developed firmware for HVAC platforms on smart thermostat products using Microchip controllers (SAMD, SAML) and incorporating BLE and RF communication protocols.
* Implemented low-level drivers for various environmental sensors including CO2, PM2.5, temperature, PIR, sound, and light sensors.
* Managed data serialization and de-serialization for communication with gateways and cloud services.
* Developed BLE stack applications and updated RF physical layer components as needed.
* Conducted troubleshooting of firmware and hardware issues during production, identifying areas for improvement.
* Contributed to the preparation of software requirement specifications for bootloader functionality.
* Collaborated with support teams and product managers to investigate issues reported in the field.
* Ensured adherence to software development best practices such as coding standards, unit testing, and static analysis.
* Provided guidance to a team of three individuals to complete other projects and proof-of-concepts (POCs).
* Utilized AVR Studio and MPLABX as Integrated Development Environments (IDEs) for application development.

Embedded Design Engineer (April 2019 – Dec 2019) - Xpheno, Bangalore

Client: west pharma

* Contributed to the healthcare platform for West Pharma, specifically on Smart Dose and Selectrum products.
* Developed applications to interface with peripherals and utilize NFC and BLE communication modules.
* Utilized NRF52 and Dialog Semiconductor BLE applications and soft devices, employing C++ programming language.
* Designed firmware applications to enable BLE wake-up for low power consumption when NFC is enabled.
* Implemented solutions for inductive load to measure distance and transmit information to the gateway.
* Prototyped Key FOBS by utilizing Angle of Arrival (AOA) and Angle of Departure (AOD) in BLE 5.2 technology.

Advanced Consultant (Feb 2016 – Jan 2019) - ALTRAN INDIA PVT.LTD, Bangalore

Client: Qualcomm India

Worked on Post Silicon validation, Characterization, and Testing tool development.

Responsibilities

* Integrated test cases using automation test tools for both standalone and bench setups.
* Demonstrated an understanding of chipset architecture and adhered to hardware design documents.
* Developed test scripts in Python and internal tools to automate processes for various System-on-Chips (SOCs).
* Led production testing activities for SOCs, creating test applications in C and Python to facilitate production flows.
* Developed log processing scripts in Python to analyze test results.
* Contributed to bug reporting, review, tracking, and preparation of test summary reports.
* Ensured effective communication of test results and status to all stakeholders.
* Authored low-level drivers and contributed to JTAG-less frameworks.

Intel Mobile Communications, Xian, China (On-site)

Worked on Post Silicon validation of NOC and SPI protocol, Test case and validating NOC module.

Responsibilities

* Led Production Validation activities for NOC and SPI.
* Developed test applications in C to test production flows.
* Validated QSPI and OSPI with existing test case flows.
* Participated in bug reporting, review, tracking, and preparation of test summary reports.
* Ensured effective communication of test results to stakeholders.

Embedded Engineer (May 2015 – Feb 2016) - POSH LABS, Bangalore

* Designed and implemented a comprehensive home automation system, integrating touch and application-based controls for complete home management.
* Developed home security applications, including gas leak detection systems and ZigBee-based wristbands for appliance control.
* Led the development and design of a complete home appliances control and monitoring system.
* Conducted board bring-up, boot loading, OS porting, and memory diagnostics for development boards.
* Utilized COAP and Contiki frameworks with hardware such as open mote and open WSN for IoT applications.
* Developed gateways and designed security protocols, focusing on encryption mechanisms to ensure data security.
* Specialized in open hardware and communication devices for IoT applications.
* Implemented IoT proof-of-concepts (POCs) from scratch based on customer requirements.

Embedded Software Engineer (Jan 2014 – May 2015) - Real Time Signals, Bangalore

* Designed and developed applications for a Vehicle Tracking System using Embedded C, focusing on firmware development for testing locations and identifying vehicles without GPS (triangulation method).
* Developed process documentation, including schematic design and battery management strategies.
* Implemented Smart Plug interfaces with various sensors such as IR, Flux, Light, PIR, Humidity, Pressure, and resistive touch panels using different microcontrollers, and developed low-level drivers for sensor integration.
* Extensive experience in Internet of Things (IoT) project development and implementation.
* Utilized various CAD tools to design schematics and layouts, and provided files for Gerber houses for manufacturing.

Embedded Intern (Jan 2013 – Dec 2013) - Nxt Gen Technologies, Hyderabad

A Low Power Physiological Parameter Monitoring System such as ECG, Temperature, Heart rate and communicating to computer.

* Experienced in the complete Software Development Life Cycle (SDLC), including system requirements collection, architecture, design, coding, development, testing, deployment, and giving demonstrations.
* Involved in schematic design, layout, fabrication support, assembling, procuring components, board bring-up, and coding with examples.
* Developed applications using C to collect aggregates and transmit data to and from connected watches. Implemented remote monitoring data display with third-party applications.

**Technology/Tools Used:** C, Code Composer Studio, OrCAD, eZ430 Chronos Watch, sub-1-GhZ transceiver, CC1101, Simpliciti Data Logger.

EDUCATION

**Jawaharlal Nehru Technological University, Anantapur.**

Master of Technology (Embedded Systems), 2011-2013, Honors: 72%

**Jawaharlal Nehru Technological University, Anantapur.**

Bachelor of Technology (Electronics and Communication), 2007-2011, Honors: 60%

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