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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

- Integrated u-boot bootloader into Smart Lighting Controllers firmware to ensure secure and reliable boot-up sequences.
- 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.
- Utilized industry-standard cryptographic libraries and protocols such as OpenSSL, AES, RSA, and SHA for data encryption and integrity verification.

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.
- Implemented TrustZone technology to establish a secure execution environment within Smart Dose firmware, ensuring protection of sensitive operations and data.

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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