Elavanthra Hariharan Hiran

Embedded Software Engineer

Results-driven Embedded Software Engineer with 4.5+ years of expertise in C, Linux, multi-threading and IPC. Strong track record of delivering high-quality embedded software solutions. Skilled in petalinux and BSP, ensuring seamless hardware-software integration. Knowledgeable in DPDK and FAPI, enabling optimized data plane performance and adherence to industry standards. Committed to innovation, exceeding project objectives with a collaborative and adaptable approach.

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Kochi, India

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TECHNICAL SKILLS

Languages
C & Embedded C, Shell scripting, Python

Networking and Protocols
DPDK, PTP, PCIe, Axienet, PHY(NR), Cell search(NR), FAPI, MACStub, Sockets, TCP, UDP

Concurrency and Communication
Multithreading, IPC

Linux Development
Petalinux, Yocto, BSP, Device driver, Linux kernel, QEMU

Version Control and Project Management
Git, JIRA Kanban

Operating Systems
Linux, Windows, FreeRTOS

Embedded Systems and Hardware
ARM cortex, PIC, AVR, Raspberry PI, Arduino, Sensor interfacing

Test and Measurement Equipment
VSG, VSA, Oscilloscope

WORK EXPERIENCE

Embedded Software Engineer
VVDN technologies

10/2021 - Present *Kochi*

VVDN is a leading ODM delivering next-gen solutions in 5G, Networking and Wi-Fi, Vision, IoT, Cloud & App.

Responsibilities/Tasks

- Demonstrated a solid understanding of 5G NR, C programming, and Linux concepts, leveraging this knowledge to deliver high-quality solutions.
- Successfully handled multi-Threading and IPC (Inter-Process Communication) aspects, ensuring efficient and reliable system performance.
- Contributed to the development of PS (Processing System) code for RFSOC and MPSOC on Xilinx telco cards.
- Proficient in working with BSP (Board Support Package), device trees, drivers, and kernel, ensuring seamless hardware and software integration.
- Designed and developed a range of applications, including a Clock Manager for PTP and internal clock synchronization, a MIB Decoder for cell search and Automatic Frequency Control(AFC), a Fronthaul Manager for fine-tuning fronthaul parameters, and a Robust Logger to log critical data from other applications.
- Debugging, Reviewing , Documentation and Customer interaction.
- Employed version control software GIT to efficiently manage and track code changes, enabling seamless collaboration among team members and utilized JIRA Kanban boards to visualize and manage workflow, facilitating efficient task tracking, issue prioritization, and timely project delivery.

Embedded Engineer
SMEC Automation Pvt. Ltd.

02/2019 - 10/2021 *Kochi & Mumbai*

SMEC Automation specialize in marine automation services and electrical instrumentation control.

Achievements/Tasks

- Demonstrated expertise in programming and interfacing ARM micro-controllers, Raspberry PI, STM32 & Arduino resulting in the successful development of various embedded systems and IoT projects.
- Proficient in working with UART, SPI, and I2C protocols, employing them effectively to interface with sensors and other peripherals, contributing to the seamless integration of hardware components.
- Played a vital role in the maintenance and repair of field instruments, supporting service engineers to ensure optimal functionality and reliability of equipment.
- Collaborated with the hardware team, providing valuable assistance in hardware designing, including schematic capture and PCB layout, contributing to the successful realisation of electronic systems.
- Successfully performed PID (Proportional-Integral-Derivative) tuning for a project, optimizing control systems and achieving precise and stable performance.

SOFT SKILLS

- Problem solving
- Time Management
- Adaptability
- Attention to Detail
- Teamwork
- Creativity

LANGUAGES

English
Full Professional Proficiency

Malayalam
Native or Bilingual Proficiency

Tamil
Limited Working Proficiency

Hindi
Elementary Proficiency

INTERESTS

- Linux kernel
- Device drivers

PROJECTS

RF Transceiver Unit (12/2022 - Present)

- Developed clock manager, successfully porting Skyworks stack with flexibility to control custom PTP, ESMC, and PTP4L stack, and manage PLL inputs and dedicated LED status.
- Implemented robust 5G MIB decoder in MPSOC's PS, handling FPGA-triggered interrupts, passing decoded values via IPC for reliable logging.
- Designed comprehensive event log system, efficiently storing and managing critical system logs generated by the MIB decoder. It also seamlessly interfaced with other managers to retrieve and log critical parameters periodically.
- Enhanced testing by modifying UIO driver to issue events, gaining valuable insights into decoder functionality and performance.
- Developed fronthaul manager, handling custom C Plane packets, dynamically adjusting parameters like eAxC ID, center frequency of DL & UL and fine-tuned parameters related SSB.
- Improved axienet device driver for two SFP ports, enhancing network performance and reliability in complex configurations.

High PHY development in Xilinx T1 card (11/2021 - 11/2022)

- Played a key role in a 7-member team to ensure fapiMacStub application's compliance with the FAPI standard.
- Enabled seamless packet transmission to the HI-PHY layer on the T1 card through PCIe using DPDK, enhancing system efficiency and compatibility.
- Implemented uplink support, PRACH, UL DCI, and various parameters in fapiMacStub to meet client requirements.
- Contributed to the implementation of UCI and HARQ in the PS application for T1 card's RFSOC.
- Developed an automated shell script for standalone test procedures, significantly improving testing efficiency.

Attendance system using face recognition (03/2021 - 06/2021)

- Developed a sophisticated attendance system with camera and IR temperature sensor interfacing to Raspberry Pi, accurately marking attendance with facial features and contactless temperature readings.
- Implemented a simple linear SVM classifier for efficient local data matching, ensuring swift action and public health safety through a critical temperature threshold feature.
- Demonstrated expertise in computer vision, sensor interfacing, and real-time data processing, resulting in an effective attendance management system with integrated health monitoring capabilities.

CERTIFICATES

Advanced Post Graduate Diploma in Embedded System & Hardware Designing with TÜV Rheinland Certified Qualification (05/2018 - Present)

EDUCATION

Post Graduate Diploma in embedded system & hardware engineering

SMECLABS

02/2018 - 05/2018 *Kochi*

Bachelor of Electronics & Communication Engineering

Cochin University of Science and Technology

08/2013 - 09/2017 *CGPA : 7.1 | Kochi*

REFERENCES

Jose Antony, Senior Software Manager

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