Anurag Tiwari

Embedded Software Engineer

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Summary

Embedded Software Engineer (10+ years) specializing in **Yocto BSPs**, **Xilinx Zynq (PS)**, **Embedded Linux**, and **device drivers** (including **MIPI CSI-2** camera). Built and containerized **Cloud RAN** applications (Docker/Kubernetes), automated validation (**Robot Framework**, Jenkins), and delivered production-grade firmware/services. Recent work at **CommScope** spans RAN managers (DM/AM/PFM), microservices (gRPC), and Kafka-backed logging—**improving test coverage and release velocity**.

Technical Skills

Low-Level & Drivers: Linux device drivers, MIPI CSI-2 camera pipeline, V4L2, I2C/SPI/UART, DMA, IRQs, GPIO, pinmux

Kernel & BSP/Yocto: Yocto (distro layers, recipes, images), U-Boot, initramfs, systemd, kernel config/patches

Board Bring-Up & Debug: Xilinx Zynq(PS), boot flow, DDR, clocks, PMIC, JTAG, logic analyzer, oscilloscope

RAN & Cloud-Native: C/C++, gRPC, Kafka, Docker, Kubernetes, microservices, CI/CD, observability

Tooling & Automation: Robot Framework, Jenkins, Git, JIRA, DOORS, Enterprise Architect

Languages: C, C++, Embedded C, Python, Shell; Web (React, Node.js) where relevant

Education

B.Tech in Electrical & Electronics Engineering

Guru Gobind Singh Indraprastha University (GGSIPU), Delhi

2014 — Score: 70.5%

Experience

Research & Development Engineer II

Jan 2022 – Present

CommScope

Bengaluru

- Owned **Yocto BSP** and image customization for Cloud RAN appliances; streamlined layer hygiene and CI, reducing image build time by **22%** and field rollouts by **∼1 day/release**.
- Implemented **PS-side drivers** and user-space control paths (I2C/SPI, DMA, IRQ) for radio subsystems; cut bring-up defects by **30%**.
- Developed **MIPI CSI-2** camera capture path on Embedded Linux (V4L2, media graph, sensor init, lane config); stabilized streaming with **0 dropped frames** in 30-min soak.
- Containerized RAN managers (DM/AM/PFM) with **gRPC** interfaces; deployed on **Kubernetes**; integrated **Kafka** log streaming and probes for SLOs.

- Established **Robot Framework** + Jenkins test automation across multi-node rigs, increasing regression coverage from ∼**45%** to ¿**80%**.

Software Engineer **Nov 2018 – Jan 2022**
Capgemini Gurgaon

- Developed **AUTOSAR-compliant** embedded software for automotive instrument clusters using Embedded C; achieved **100%** requirement coverage for telltale and door warning applications.
- Implemented comprehensive testing strategy (Unit, Integration, System) using **CANoe/CANalyzer**; reduced field defects by **25%** through systematic validation.
- Built Smart-Grid Network Interface Card applications with **OTA update capability**; designed robust commissioning protocols for Smart Meter deployment.
- Managed requirements traceability using **DOORS** and **JIRA**; maintained **98%** documentation compliance across embedded software lifecycle.

IoT Support Engineer **Jan 2018 – Aug 2018**
BuffaloGrid Project Pvt Ltd Delhi

- Developed embedded firmware for distributed solar-powered charging hubs; implemented **FOTA** capabilities and **Battery Management System (BMS)** with power optimization.
- Created **test automation** scripts and frameworks, improving testing efficiency by **40%** and reducing manual validation effort.

Embedded Software Engineer **Dec 2015 – Dec 2017**
Eigen Technologies Pvt Ltd Delhi

- Led firmware development for **WSN-based** smart streetlight system and **BLE** smart home automation; ensured **802.15.4/Zigbee** protocol compliance.
- Designed and deployed IoT dashboard with **AWS** backend infrastructure; integrated **4G gateway** using AT commands for remote sensor data aggregation.
- Conducted comprehensive firmware QA testing across multiple wireless protocols, achieving **99%** interoperability success rate.

Selected Low-Level Systems Projects

Yocto BSP for Custom Zynq Board

Distro layers, U-Boot patches, kernel config, image recipes; reduced boot time via systemd unit profiling and init sequence trimming.

MIPI CSI-2 Camera Driver & Pipeline

Sensor init (I2C), CSI lane timing, V4L2 sub-dev, media controller graph; validated with long-run soak, artifact-free frames.

PS-Side DMA/Interrupt Path

Engineered robust DMA ring buffers and IRQ service; back-pressure handling to maintain deterministic throughput.

RAN Microservices on K8s

gRPC services (DM/AM/PFM), Kafka log bus, readiness/liveness probes; Helm deploys and blue/green updates.

HW Bring-Up & Debug

Pinmux, clock tree, PMIC init; boundary scan + JTAG; logic analyzer traces for ISR latency verification.

Updated on: September 26, 2025