

Anurag Kumar Singh

+91 9380686024 [✉ anurag3301.0x0@gmail.com](mailto:anurag3301.0x0@gmail.com)

[🌐 linkedin.com/in/anurag3301](https://www.linkedin.com/in/anurag3301) [🐙 github.com/anurag3301](https://github.com/anurag3301) [📝 anurag3301.dev/blog](https://anurag3301.dev/blog)

Embedded Systems Engineer with experience spanning bare metal firmware, RTOS, and Linux BSP development across ARM Cortex-M and Cortex-A platforms. Skilled in taking hardware from bring-up to production, with hands-on work in Yocto, device drivers, and MCU peripheral programming.

Experience

SightForge Technologies

Oct 2024 – Present

Embedded Linux Engineer

Bangalore, Karnataka

- Led bring-up of a i.MX6Q (ARM Cortex-A9) board from UUU/MFGTool life-check to a production Linux image.
- Configured U-Boot, DDR initialization (DCD), SPI flash, SD/MMC, and NFS boot workflows for board bring-up.
- Developed Yocto BSPs with meta-layers, BitBake recipes, kernel configuration, and board-specific device trees.
- Enabled Ethernet, USB, SD card, and OV5640 CSI camera support through driver and device tree bring-up.
- Built a GStreamer + V4L2 media pipeline using IPU/VPU acceleration, reducing video capture latency by 40% compared to software-only fallback.

Projects

TI-DM3730-EVK-BSP | Yocto, Linux Kernel, U-Boot, Device Tree

- Developed a modern Yocto-based BSP for TI DM3730 (Cortex-A8), replacing the legacy vendor software stack.
- Ported kernel and U-Boot with updated device tree support; enabled NFS, NAND, and MMC boot along with I2C, SPI, UART, and Ethernet interfaces.

STM32 PIO Libraries | STM32Cube HAL, PlatformIO, Embedded C

- Created and maintained reusable STM32 drivers for SSD1306 OLED, HC-SR04, DS1302 RTC, NEO-6M GPS, and Nokia 5110 display modules using STM32Cube HAL.
- Published 5 libraries to the PlatformIO registry with hardware-agnostic design and pluggable I2C/SPI transport callbacks, actively used across the STM32 community.

nvim-platformio.lua | Lua, Neovim, PlatformIO

- Developed a Neovim plugin providing a VS Code-like PlatformIO workflow with build, upload, serial monitor, and project management features.
- Gained 190+ GitHub stars, 19 forks, and 9 contributors, one of the most active PlatformIO integrations for Neovim.

LockPi Linux Smart Lock System | C, Yocto, Raspberry Pi 4, I2C, GPIO

Capstone – CU Boulder Advanced Embedded Linux Development

- Built a PIN-based smart lock on RPi4 with custom Linux char drivers for keypad matrix and GPIO relay; implemented PCF8574 I2C LCD, PIN validation logic, and socket server for remote access log streaming.
- Packaged as a Yocto image using a custom meta-lockpi layer for single-command deployment.

Technical Skills

Languages: C (C89/C90), C++ (C++17), Python, Bash, Lua

Embedded Linux: Yocto Project, BSP Development, Linux Kernel, Device Tree, U-Boot, Buildroot, Cross Compilation, GStreamer, V4L2

Embedded MCU Development: Bare Metal Programming, FreeRTOS, OpenOCD, SWD/JTAG Debugging, PlatformIO

Debugging & Tools: GDB, Git, Valgrind, Perf/Ftrace, Serial Console/UART Debugging, MFGTool, UUU

Application Processors: NXP i.MX6, TI DM3730, TI AM67A, Raspberry Pi

Microcontrollers: STM32, RP2040, RP2350, AVR

Interfaces & Protocols: I2C, SPI, UART, MMC, Ethernet, CSI Camera Interface, LCD/DSS

Networking & Communication: lwIP, MQTT, REST APIs, HTTP Servers, TCP/IP, Protobuf, JSON, SQLite

Education

University of Colorado Boulder (Coursera)

Jun 2025 – Oct 2025

Advanced Embedded Linux Development Specialization

CHANDIGARH UNIVERSITY, Distance

Jul 2024 – Jun 2026

Master of Computer Applications (MCA)

Presidency College, Bangalore

Oct 2021 – Jul 2024

Bachelor of Computer Applications