RITAM MUKHERJEE

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SUMMARY

Software Engineer with production experience spanning firmware development, release automation, and DevOps pipelines. Delivering build automation and CI/CD tooling at Qualcomm for Snapdragon platforms. Bare-metal ARM Cortex-M firmware for real-time drone detection systems at IIO Technologies. Skilled in C/C++, Python, RTOS, and low-level system debugging.

SKILLS

Programming Languages: C, C++, Python

OS: Linux Basics, CLI commands

C/C++ Depth: Advanced pointers, dynamic memory, bit manipulation, OOP, templates, STL, smart pointers, RAII, move semantics, lambdas, constexpr

Python: Scripting, automation, rapid prototyping, test frameworks

Embedded Systems: ARM Cortex-M, bare-metal programming, HAL, direct register access, interrupt handling, NVIC, fault handlers

Peripherals & Interfaces: GPIO, Timers, PWM, ADC, DAC, UART, I2C, SPI, CAN, USB

Memory & Power: DMA, flash programming, EEPROM emulation, low-power modes (Sleep/Stop/Standby)

RTOS: FreeRTOS: task scheduling, queues, semaphores, mutexes, tickless idle

Connectivity & Protocols: MQTT, CoAP, TCP/IP, Wi-Fi, BLE 5.0, LoRa

Debugging & Testing: GDB, JTAG/SWD, OpenOCD, oscilloscope, logic analyzer, RF analyzer, ADB, crash dump triage, unit testing, automated regression testing, static & dynamic analysis

Build Systems & DevOps: GCC, ARM GCC toolchain, CMake, Make, Git, Gerrit, Docker, CloudBees CD, CI/CD pipelines, log parsing

EXPERIENCE

Qualcomm *| Contract (FTProtech)*

Software Engineer | May 2025 – March 2026

- Managed end-to-end release lifecycle for Pakala (Snapdragon 8 Gen 4) and Eliza (Snapdragon 7 Gen 4), coordinating cross-functional teams to deliver error-free builds on schedule.
- Triaged C/C++ crash dumps and system-level logs for embedded ARM targets, pinpointing firmware regressions and driving root-cause resolution across release branches.
- Maintained and optimized C/C++ toolchain environments for embedded ARM platforms, resolving compiler and linker failures to maintain build stability.
- Built Python automation for root sanity checks and Customer Release Verification (CRV), eliminating manual QA steps and reducing verification time per release cycle.
- Developed Python-based build integrity monitors and automated release reports, enabling early detection of failures across multiple active release branches.

IIO Technologies Pvt Ltd

Associate Embedded Engineer | Oct 2024 – May 2025

- Implemented bare-metal C firmware for a multi-sensor drone detection platform, integrating RF, acoustic, thermal, and vision subsystems on ARM Cortex-M.
- Applied real-time signal processing algorithms in C, meeting strict timing constraints on resource-constrained ARM MCUs for accurate drone detection and classification.
- Implemented sensor fusion (RF + acoustic + vision) pipeline to improve multi-modal classification accuracy and reduce false-alarm rates.
- Configured SDR-based RF modules to capture and analyze drone control signals across multiple frequency bands, enabling wideband threat detection.

PROJECTS

OS Image Release Automation | Qualcomm

- Built end-to-end Python automation for release validation, covering image packaging, root sanity checks, and Customer Release Verification (CRV).
- Incorporated Qualcomm internal compilation and device flashing workflows into the pipeline, enabling automated binary generation and on-target deployment per release cycle.
- Integrated the full pipeline with CI/CD, delivering faster release cycles.

Build Integrity Monitoring & Deployment System | Qualcomm

- Built Python tooling to monitor build integrity across all active release branches, automating packaging, staging, and deployment for QA and customer deliveries.
- Implemented automated alerting for build failures and sanity regressions, ensuring consistent on-time milestone deliveries.

Anti-Drone Detection System | IIO Technologies

- Programmed ARM Cortex-M/AVR MCUs in C/C++ for real-time multi-sensor signal processing with power-optimized firmware design.
- Integrated a lightweight on-device ML model for drone/bird classification, reducing false-alarm rates for security-grade deployment.
- Validated end-to-end system performance using oscilloscopes and RF analyzers, confirming long-range detection capability across target frequency bands.

EDUCATION

Maulana Abul Kalam Azad University of Technology

B.Tech in Electronics and Communication Engineering | May 2018 – May 2022

CGPA: 8.33 / 10.0

CERTIFICATIONS & TRAINING

Vector India — *Bengaluru, Karnataka*

Embedded Systems Training | May 2023 – May 2024

LANGUAGES & INTERESTS

Languages: English, Bengali, Hindi

Interests: Embedded Systems, IoT, Firmware Engineering, Edge AI / TinyML