

Himanshu Pawar

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Embedded Firmware Developer @ Capgemini

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TECHNICAL SKILLS

- **Programming Languages:** Expert in **C**, **Embedded C**, and proficient in **Python** for scripting.
- **Communication Protocols:** In-depth experience with **UART**, **SPI**, and **I2C** interfaces.
- **Debugging & Testing Tools:** Skilled with **IAR Embedded Workbench**, **Logic Analyzer**, **Oscilloscope**, and static analysis with **Coverity**.
- **Memory Management:** Strong knowledge of **RAM/ROM mapping**.
- **Development:** Version control with **Git**, code editing in **Visual Studio Code**, and firmware flashing using **STM32Cube Programmer**; competent in data tracking via **Excel**.
- **Soft Skills & Methodologies:** Collaborator with a knack for **problem-solving**, thrives in **agile development** environments.

PROFESSIONAL EXPERIENCE

Professional I Embedded Firmware Developer

Capgemini | Aug 2022 – Present

- **Engineered** end-to-end **OTA firmware upgrade** feature supporting both full image and delta updates for resource-constrained embedded devices.
- **Developed** secure update processes using **AES-GCM** encryption, reducing data breach risk by **40%**.
- **Crafted** robust **loader-to-loader upgrade** logic and firmware **recovery mechanisms** to safely handle failed or interrupted update cycles.
- **Engineered** linker-script-based memory partitioning strategies to effectively segregate Flash and SRAM.
- Integrated **IC Class** and **OBIS Code** object models (per IEC **Blue Book**) to enhance data identification accuracy by **30%**.
- **Reduced** firmware deployment and debugging errors by **20%** through optimization using **IAR Embedded Workbench**, including enhanced memory mapping and stricter boundary checks.
- Prevented **illegal memory access** and bolstered system stability by implementing robust boundary validation logic and linker-script-guided memory partitioning.
- **Designed** and integrated compliant **DLMS/COSEM** object classes and **COSEM** object models (notably **OBIS Codes** and **Interface Classes**).
- Configured and toggled **GPIOs** for hardware-level controls.
- Utilized **logic analyzers** to monitor and debug **SPI/I2C/UART** bus communications, validate signal timing, and trace low-level firmware/hardware interactions.

PROJECTS

Smart Energy Meter – Firmware Developer

- Supported **manual and automated QA** teams by maintaining comprehensive firmware test cases. Developed compliant firmware for **smart energy meters** based on **DLMS/COSEM protocols**.
- Designed an **end-to-end FOTA upgrade framework**, integrating **bootloader fallback**, staging, image validation, and rollback protection to prevent bricking and data loss during **FOTA** updates.
- Implemented **OBIS code-based object models** to standardize data representation as per **IEC 62056**.
- Integrated **AES-GCM encryption** to secure data communication and firmware updates.
- Configured and toggled **GPIO pins** for peripheral control, diagnostics, and status signalling across various microcontroller environments.

EDUCATION

Bachelor of Technology (B. Tech) in Mining Engineering
National Institute of Technology Raipur (NIT Raipur)

Graduated: May 2022
CGPA: **8.42**