

TAMOJIT SAHA

Senior Firmware Engineer | Senior Embedded Systems Engineer

Kolkata, India • +91 8420833708 • sahatamo1995@gmail.com

github.com/TamojitSaha • LinkedIn: [Tamojit Saha](#)

PROFESSIONAL SUMMARY

Senior Firmware Engineer with 7+ years designing and shipping production-grade embedded systems across smart metering, railways, defense communication, industrial automation, and IoT. Deep expertise in Embedded C, RTOS-based firmware architecture, BLE and cellular connectivity, and OTA/FOTA systems on STM32, Nordic nRF52, Silicon Labs, ESP32, and RP2040 platforms. Proven record of optimizing firmware reliability and update performance, designing custom bootloaders, and building robust multi-protocol communication stacks.

CORE SKILLS

Languages: C, C++, Python

Microcontrollers & Architectures: STM32 (L4/F4/G0), Nordic nRF52, Silicon Labs EFR32BG22, TI MSPM0G, RP2040, ESP32/ESP8266, AVR (ATmega/ATtiny), ARM Cortex-M0+/M4, Xtensa

RTOS: FreeRTOS, vendor OpenCPU RTOS

Connectivity: Bluetooth Classic & BLE, Cellular (GSM/GPRS/LTE), GPS/GNSS, Wi-Fi, Ethernet, LoRa

Protocols: UART/USART, SPI, I2C, RS485, 1-Wire, MQTT, AT Commands, JTAG, SWD

Firmware Domains: OTA/FOTA architecture, custom bootloader design, low-power design, device drivers, sensor fusion, communication protocol design

Tools & IDEs: STM32CubeIDE, Keil uVision, Segger Embedded Studio, Code Composer Studio, Segger RTT, Git/GitHub, Makefile, VS Code

Hardware Design: KiCad, EAGLE CAD, EasyEDA

PROFESSIONAL EXPERIENCE

Iskraemeco India Aug 2023 – Present

Senior Firmware Engineer

- Engineered BLE and cellular Network Interface Cards (NICs) for smart metering systems using Nordic nRF52, Silicon Labs EFR32BG22, and OpenCPU cellular modems with AT command interfaces.
- Designed checksum-based error detection and retransmission in custom bootloaders to ensure reliable over-the-air firmware delivery.
- Improved firmware resilience during power-interruption scenarios by ~33% using interrupt-driven event handling and hardware timers.
- Reduced OTA/FOTA upgrade duration by ~50% through flash and communication stack optimizations.
- Designed and implemented differential FOTA logic for upgrading cellular modem firmware.
- Contributed to OpenCPU modem firmware development with focus on RTOS task scheduling, memory management, synchronization, and resource optimization.

Applied Electro Magnetics Nov 2022 – Aug 2023

R&D Application Engineer / Firmware Engineer

- Led firmware development of multiple railway-compliant products built to Indian Railways standards.
- Built Ethernet-based, GPS-synchronized digital and analog railway clocks with web-UI configuration; implemented auto-positioning recovery on the analog clock using micro-step counting after power loss.
- Developed an 8-channel differential asynchronous serial data processor integrated with touch-enabled HMI displays.

- Developed a multi-port serial TestBench and PySide desktop application for validating voice communication systems at Indian defense airports, integrating a USB oscilloscope via Python SDK API.
- Built PySide desktop applications for automatic discovery and management of network-attached devices.
- Developed a 6-step Hall-sensor-based BLDC motor controller with a customized soft-braking algorithm.

Lazot Technologies May 2021 – Oct 2022

Embedded Systems Engineer

- Reverse-engineered unsupported e-paper display formats and developed custom drivers from scratch using vertical-traversal rendering.
- Engineered a battery-powered e-paper price-tag platform with web-UI configuration and automatic data sync from Google Sheets.
- Developed a RESTful backend prototype in Python (FastAPI) for centralized management of e-paper devices.
- Built RTOS-based firmware for a multi-sensor hub integrating I2C, SPI, RS485, and 1-Wire protocols.

Achilles Resolute Jan 2020 – May 2021

Embedded Systems Engineer

- Developed a hardware-timer-driven cooperative scheduling framework in C++ for 8-bit AVR microcontrollers.
- Engineered a low-power wearable safety device monitoring heart rate, SpO2, and motion, with IMU-based impact detection and haptic feedback.
- Designed a privacy-compliant occupancy monitoring system with AWS IoT Core integration and Wi-Fi/cellular fallback.

Icosys Technologies Mar 2019 – Jan 2020

Embedded Systems Engineer

- Developed IoT products combining digital and analog electronics, including firmware for sensor acquisition, calibration, and testing.
- Designed PCBs and developed data-acquisition, testing, and calibration methodologies following industrial compliance standards.

EDUCATION

M.Tech, Electronics & Communication Engineering 2017 – 2019

Institute of Engineering and Management, Kolkata — CGPA 8.72

B.Tech, Electronics & Communication Engineering 2013 – 2017

Techno India University, Kolkata — CGPA 8.63

PUBLICATIONS

- **Precision Thermocouple Amplifier for Substrate Temperature Monitoring in an ECR-PE Nano-Film Deposition System** — A. Mukherjee, T. Saha (2018). DOI: 10.1109/IEMENTECH.2018.8465349
- **Chaotic Cipher Based Spatial Domain Steganography with Strong Resistance Against Statistical Attacks** — T. Saha, S. Sengupta, T. Dasgupta (2017). DOI: 10.1109/ICRCICN.2017.8234536

ACHIEVEMENTS & MEMBERSHIPS

- Associate Member, The Institution of Engineers (India) — Membership No. AM1813504 (2018).
- Best Project, National Science Day Exhibition, Science Association of Bengal (2016).
- 2nd Place, Electronically Yours, Edge X 2016 Technology Convention; 2nd Place, Contrive, Avenir 2015; Winner, Electronically Yours, Edge 2015.