Mohamed Amine MTAALLAH

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Senior Embedded Firmware Architect

Nearly 15 years of experience in firmware development for embedded systems, MMWAVE sensors, STM32 MCU's ecosystem (HAL drivers, bootloader, memory and sensors drivers), IoT products, communication protocol and secured solutions. Worked on different products : mmwave radars, residential gateways, smart electrical meters, smart water meters, smart home devices (flood detector and shut-off valves), smart industrial gateways, customer products (Grohe, Bosch, Vaillant, Schellenberg ….)

I have valuable experience in firmware architecture definition and development in Application, Middlelayer and Platform Layer (HAL). I also have a rich experience with firmware and hardware debugging.

Skills : C , C++ , Python, Embedded System architectures, Embedded linux, Model-driven development with mbeddr, IoT, microcontrollers (STM32, CC3235, ESP8266, ESP32 ….), MMWAVE sensors (AWR1843, AWR2243, AWR2944)Yocto, Cortex-M Architecture, AWS (thingshadow), Azure (Device Twin), Agile, Cloud, Technical Leading and support, Cryptography and Security, Communication Protocols (SPI, I²C, UART, TCP/IP, TLS, BLE, SOMEIP, XCP….). IA models training and integration in embedded devices.

Professional experiences

Senior embedded firmware architect : March 2023 – now
Genow

Technical roles:
- Firmware architecture definition for product based on mmwave sensors, IA processor and STM32 mcu
- Participate in technical discussions for hardware design needs
- Getting started and debugging new produced Hardware

Projects:
- Development of our product based on IA processor, mmwave sensor and STM32 mcu
- Integration of BLE communication between STM32WB and Mobile APP
- Integration of SIM808 (4G modem) driver to communicate with Web server
- Implementation of IA model inference on jetson nano
- Implementation of FOTA update for mmwave sensor and IA inference Model
- Electronic Design for a product based on IA processor, mmwave sensor, sim808 and STM32 mcu

Keywords: STM32 MCU's (HAL Driver), AM273x, AWR1843, AWR2243, AWR2944, RTOS, C, Git, Gitlab, FOTA, BLE, Peripheral drivers, 4G Modem, AT Cmds, IA, Jetson Nano, Xmodem, Altium, Mmwave Sensors,

Senior embedded firmware architect : September 2017 – February 2023
Itemis (itemis.com)

Technical roles:
- Firmware architecture definition and development for IoT product
- Secure solution implementation
- Model driven development with mbeddr (components, unit tests, application)
- Support and mentor development team members
- Participate in technical discussions and code reviews
- Collaboration with DevOps team to setup CI/CD process for embedded projects

Management role :
- Task definition and effort estimation based on technical specification
- Participate in strategy and planning definition for Itemis products
- Team Leading

Projects:
- IoT product development for Schellenberg based on AWS thingshadow
- Proof of concept for C3ECU gateway Delta update based on Yocto
- Ebus Protocol implementation on Linux
- FOTAHub sdk's development for STM32, ESP8266, ESP32, Arduino and RaspberryPi
- Lemonbeat Modbus Adapter architecture definition and implementation
- Grohe Sense, Guard and BlueHome bugfix and new features implementation
- Bosch secure service protocol optimization and implementation for eBike
- Feasibility study for data flow and process scheduling for Bosch
- Internal IoT product development based on AWS thingshadow, RF and BLE communication
- Implementation of generic secure setup protocol for IoT product
- Implementation of FOTA update using 4G Modem for STM32

Keywords: STM32 (HAL Driver) , ESP32 (ESP-IDF), EFM32, CC32, Raspberry, Arduino, nonOS, RTOS, networking, C/C++, AWS (ThingShadow), Azure (Device Twin), Model-driven development, mbeddr, MPS, Git, Gitlab, MQTT, FOTA, BLE, Json, Modbus, S2LP, Data model, Peripheral drivers, TestLink, Linux, FotaHub, Gradle, Docker, Yocto, WSL2, 4G Modem, AT Cmds
References: FotaHub (www.fotahub.com , github.com/fotahub)

Senior Embedded Engineer : April 2015 – August 2017
SagemCom (sagemcom.com)

Technical role :
- Bug fixing and implementation of new features in residentials gateways based on Linux (openWRT) for the following customer British Telecom (UK) and Charter (Canada)
- Bug fixing and implementation of new features in smart meters compliant with DLMS/COSEM standards for the following products CX 2000-9CT EPS (Serbia), CX 1000-6/CX 2000-9 Energa (Poland), CX 2000-9 EVN (Austria)

Projects :
- Core dump manager implementation for residentials gateways
- Implementation of option 82 insertion in DHCP packet using netfilter library and packet mangling
- Implementation of data protection class to execute signed command on smart meters
- Bug fixing for the following services Billing, Disconnector and Load Profile within smart meters

Keywords: STM32, RTOS, C/C++, DLMS, COSEM, Keil, SVN, multi-processor architecture, Embedded Linux, ADSL, FTTH, PPP, DHCP, TR69, TR181, OpenWRT, wireshark

Application engineer: August 2010 – March 2015
STMicroelectronics ([st.com](st.com))

Technical role :
- Implementation of low layer driver and bootloader for STM32 microcontrollers
- Implementation of component drivers (external memories, sensors) and demonstration firmware
- Writing technical document

Projects :
- Implementation of SPI, I²C and UART low layer drivers for STM32 F4, F0, F3, L0 and L4
- Specification and implementation of I²C CPAL driver for STM32 MCU's
- Writing user manual for I²C CPAL driver and application note for I²C timing configuration
- Implementation of bootloader for STM32 microcontrollers
- Implementation of a specific bootloader based on SPI for Samsung

Keywords: STM32, RTOS, C, IAR, Keil, SVN, Bootloader, I²C, SPI, UART, CPAL
References: CPAL (st.com/en/embedded-software/stsw-stm32127.html)

Professional trainings

Embedded C and CAN/FDCAN protocol
Cortex-M3/M7 and STM32 architecture
How to secure embedded systems (hardware/firmware)

Education

National Graduate Engineering Studies in Microelectronics : 2008 – 2010

Mastery in Industry and Automation: 2004 – 2008

Languages

English	Advanced
French	Advanced
German	Academic
Arabic	Mother tongue

Hobbies

Delivering happiness to my family

Fishing