

Mahmoud Mohamed Mohamed

Address: District 4-Area 10, 6th October City, Giza

Mobile: +201283953205

Email: mahmoudalielkothack@gmail.com

LinkedIn: [linkedin.com/in/mamoud-el-kot-a6495422b](https://www.linkedin.com/in/mamoud-el-kot-a6495422b)

GitHub: <https://github.com/MahmoudElkothack/>

SUMMARY

I am a growth-oriented embedded software developer, familiar with C/C++ - Python, I have practical knowledge in general layered architecture, TCP/IP protocol stack, Ethernet and SSL protocol. I am proficient in C/C++.

WORKING EXPERIENCE

July-2021 Embedded Software Developer at IOTECH Solutions

"Present"

Rules and Responsibilities:

- Responsible for the R&D of the company's products.
- Architect, Design, Implement and Test new products based on customer's needs.

Products Developed:

Wiznet Project:

W7500 (which act as Gateway) Connected to Backend Server through Ethernet by Using Socket Programming (TCP Session) To Send Commands & Configuration to Gateway. Gateway Take Configuration or Commands and Send It to the List Meters which Connected with Gateway Through RS485 By Using HDLC Protocol. After that it Get Response from Meters and send it to Server.

Custom Bootloader:

Two Program (One for Bootloader and other for App). Every Program Has it's own IV Table. And every Image has It's Own Header (Which Contain It's Entry Address - CRC - Version - Validation flag). After Booting the Boot Program Check for flag If it should jump to App Program or Wait for Receiving the update and after Receiving the update. It change the Flag To not enter Boot Mode and make SW Reset for Next Checking if it should Enter Boot or Jump to App Program.

Controllers: TM4C123GXL

Pepsi Project: STM32F103C8 connected to two temperature sensors to measure the temp of Pepsi machine also connected to water flow meter to measure the quantity absorbed from the tank and three inputs (one to indicate if the machine is on or off the second is dispenser to indicate the time the dispenser was on the third to indicate how much time the compressor on and how many time is on. STM32F1-3C8 also connected to GSM/GPRS via UART to send all this data through cellular network to OPENHAB server with time stamp which GSM/GPRS get from cellular network instead of RTC module and all this info get stored in EEPROM as a log.

Used techniques (UART, I2C, AT COMMANDS, MQTT, Timers, GPRS, NTP, GPS).

Controllers: STM32F103C8

- **Smart Home Controller:** the project takes command from user using a touch panel and then actuates those commands using relays to control lighting, it also takes readings from a metering IC and displays it to the user on the touch panel.
Used techniques (**UART, SPI, ADC, WIFI, MQTT, Timers**).
Controllers: ESP32, STM32
- **Smart IR Controller:** The project controls Devices like TV and AC by generating IR Signals to emulate their Remote-control button presses.
Used techniques (**PWM, WIFI, MQTT**).
Controllers: ESP8266
- **Smart Soil Monitoring System:** The Device takes reading from sensors (NPK sensor – Temp./Humid. Sensor) present on the bus and takes reading from a flow meter and displays it to the user on a web page linked to MQTT server.
Used techniques (**ADC, MODBUS, WIFI, MQTT**).
Controllers: ESP8266
- **Smart City Lights System:** The Device Controls Lighting Pools on the Street, it uses a mesh topology communication / Tree Topology data stream so that from one spot you can control the Light Pool (ON/OFF/DIM (1~100)).
Used techniques (**WIFI, MQTT**).
Controllers: ESP8266
- **Smart 3-Phase meter:** Takes the reading of a 3-phase meter and calculates the power consumption of the user and displays it to the user on a webpage linked to MQTT server.
Used techniques (**WIFI, MQTT, SPI**).
Controllers: ESP8266

TRAINING:

NTI, |October/2021-november/2021

- RTOS & AUTOMOTIVE

YOUXEL Technology, Cairo |July/2017-Aug/2017

- Reviewed hardware schematics and developed software for embedded systems

Suez Canal Authority, Ismailia | June/2016 – July 2016

- Examined marine radio equipment and optical fiber technology

COURSES

- AUTOSAR in Depth (Application Layer) (Eng Keroles Shenouda).
- Embedded Linux Step By Step Using BeagleBone Black. ([Udemy](#))
- Advanced C programming ([Udemy](#)).
- Modern C++(Youtube).
- Introduction to ML([Coursera](#)) .
- Introduction to Internet of Things and Embedded Systems([edX](#)).
- Real-Time Bluetooth Networks([edx](#)).
- Mastering 4 critical skills using C++ ([Udemy](#)).
- Embedded Systems Programming on ARM Cortex Processor ([Udemy](#)).
- Master Microcontroller and Embedded Driver Development 1 ([Udemy](#)).
- Master Microcontroller: Timer-PWM-CAN-RTC-Low power 2([Udemy](#)).
- Mastering RTOS: Hands on FreeRTOS and stm32fx with debugging ([Udemy](#)).
- Software Development Processes and Methodologies ([Coursera](#)).
- Socket Programming ([Youtube](#)).
- Linux+ & A+ & CCNA. ([Plurasight](#)).

TECHNICAL SKILLS

- C/C++/Modern C++
 - TCP/IP
 - Data Structures and Algorithms
 - Octave
 - OOP
 - RTOS
 - MATLAB
 - Python
 - Software Development Life Cycle
 - ARM Cortex-M3/M4 Architecture
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- Familiar with different Microcontrollers such: STM32F1XX – STM32F4XX - ATmega32- PIC16F877A - CC3220 Launchpad –ESP8266-ESP32 DEV –BeagleBone Black.
 - Microcontroller - Peripherals such: GPIO - Timers - PWM - PLL - WFE/WFI - Low Power Modes - RTC.
 - Microcontroller - Interfacing such: GSM/GPRS Module (A6-AI) - Ultrasonic - Temperature Sensor - DC Motor - Servo Motor – Keypad – Gas sensor – soil EC Humidity Temperature Sensor – NPK Sensors.
 - In-Vehicle Communications (CAN – LAN).
 - Serial Communication (SPI - I2C - UART - Modbus).
 - IOT protocols (MQTT _ 6lowpan _ Wi-SUN).
 - Familiar with HOMIE – KNX – PJON Lib – AT Commands.
 - Familiar with MakeFile and Bash Script and Assembly Language.
 - Understanding ROM –Uboot-Kernel boot process on Linux-ARM systems and Testing.
 - Kernel, Bootloaders compilations Step-by-Step and testing on Beaglebone Hardware.
 - Understanding platform devices and how it works.
 - Understanding Linux device Tree
 - eMMC OS updating and booting new Debian OS.
 - Serial booting (UART).
 - TFTP booting.
 - NFS booting.
 - Understating various boot modes of AM335x.
 - Busybox compilations and Testing.
 - Configuring and using BuildRoot on Beaglebone black.
 - Writing uEnv dot txt from scratch and Testing.

TOOLS

- | | |
|----------------------|----------------------|
| • STM32 Cube IDE | • FreeRTOS |
| • Keil_Uvision IDE | • Atmel Studio IDE |
| • GNU Tools Chain | • IAR IDE |
| • OpenHAB | • ESP-IDF PLATFORM |
| • Proteus | • SEGGER System View |
| • Eclipse IDE(C/C++) | |

EDUCATION

Bachelor of Engineering in Communication and Electronics Department- Suez Canal University 2019.

Project Graduation Grade: EXCELLENT.

Grade: Good.

Military Service Status: Completed (April/2020-june/2021).

Skills

❖ **Language Skills:**

- Arabic (Mother tongue).
- English - Very good.
- French (Fair command of both oral and written skills).

❖ **Personal skills:**

- Team player
- Capability of leading a team.
- Decision Making.
- Ability to organize myself to perform the assigned tasks.
- Motivational Speaker.
- Ability to work under pressure.
- Time Management.