# AHMED HASSAN

Embedded Software Engineer.

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## EDUCATION

*2016-2021* **Bachelor's Degree (Certificate)**
*Faculty of Engineering, Fayoum University*
- Bachelor of Computer and Systems Engineering.
- *Graduation Project:* Sightful, an embedded device to help people with visual impairments to be more aware about surroundings.
  Technologies used: Embedded Linux (Raspberry Pi), AI and Machine Learning.

*2013-2016* **High School (Certificate)**
*Salah Salem High School in Fayoum*
Science and Mathematics Division.

**Military Status:** Exempted

## COURSES

*Jun, 2019 - Nov, 2019* **Embedded Systems Diploma (Certificate)**
*IMT School*
- Embedded Systems Concepts and Embedded C Programming.
- AVR Micro-controller Peripherals Interfacing, Tooling and Testing.
- *Final Project:* Mobile-controlled and Obstacle Avoidance Robot.

*Jul, 2020 - Oct, 2020* **ARM Architecture Diploma (Certificate)**
*IMT School*
- ARM Architecture and Programming Model.
- STM32 Micro-controller Interfacing.
- IOT Concepts.
- *Final Project:* On the Air Programmer (OTA).

*Mar, 2021- May, 2021* **Embedded Automotive and AUTOSAR Device Drivers (Certificate)**
*Mohamed Tarek*
- AUTOSAR Layered Architecture and Device Drivers.
- AUTOSAR and C MISRA Rules
- Automotive buses LIN and CAN.
- Implement DIO and PORT AUTOSAR Driver for TM4C Micro-controllers
- *Final Project:* Apply the full layered architecture model.

## TECHNICAL SKILLS

- **Programming Languages.**
  C, C++ and Embedded C.
  Java, Kotlin, Python and Dart.
- **Microcontrollers Interfacing.**
  AVR, STM, TIVA-C and PIC.
- **Sensors Interfacing.**
  PIR, IR, Ultrasonic and more.
- **Communication Protocols.**
  SPI, I2C, UART, CAN, LIN, USB.
- **IoT.**
  NodeMCU Board (ESP8266).
- **Embedded Linux**
  Working with Raspberry Pi.
- **RTOS.**
  FreeRTOS and building simple Scheduler based on Time Triggered Embedded Systems.
- **AUTOSAR.**
  AUTOSAR Layered Architecture and Device Drivers.
- **Problem Solving.**
  Algorithms and Data Structures.
- **Mobile and Web Applications Development.**
  Develop Mobile Applications with Flutter Cross Platform and Web Applications with HTML, CSS,JS.

## PERSONAL PROJECTS

- **OTA Programmer (GitHub).**
  - Implement OTA Programmer for STM32 Micro-controller using NodeMCU Board.
  - It used to flash hex file on MCU using website wirelessly with the bootloader flashed in the STM32 Flash Memory.
  - The user uploads a hex file using the website, then NodeMCU reads the file content from the internet and start sending it.
  - On reset, STM waits for 5 seconds for received code and after receiving all code and flashing it in application area of the Flash Memory it starts to run the code.
  - If it didn't receive anything for 5 seconds, it will run the last flashed code in the application area. (Illustrating Video).
- **OS Scheduler (GitHub).**
  - Implement OS Scheduler to schedule one-shot or periodic tasks in C program for microcontrollers.
  - The user configures the number of tasks then add each task with its first call time and period time.
- **AUTOSAR Drivers (GitHub).**

  Implementation of AUTOSAR Port and DIO Drivers for TM4C Micro-controller and implementing its configuration tool to generate configuration files automatically.
- **MIPS Processor (GitHub).**
  - Implementation of Single Cycle MIPS Processor in System Verilog.
  - The processor can execute assembly R-type and I-type instructions like (`add`, `sub`, `sll`, `or`, `mult`, `div` and more).
- **Safety Jacket for Baby (GitHub).**
  - Implement Safety Jacket contains temperature, flame, smoke, IR and other sensors to send an SMS Message using GSM Module if anything unusual happens around the baby.
  - The project is implemented with STM32 and Arduino Nano.
- **Mobile Controlled Robot (GitHub).**
  - Implement Mobile controlled robot that can be controlled using mobile application.
  - It can avoid obstacles using Ultrasonic Sensor.
  - When the robot is not moving, a buzzer will beep when any movement is detected with PIR Sensor.
- **Digital Multimeter (GitHub).**
  - Implement Auto-range Digital Multimeter based on (ATmega32) which has:
  - Ohmmeter measures from 5 Ohms to 3 Mega Ohms.
  - DC Ammeter measures from 5 mA to 2 A.
  - AC Ammeter measures from 5 mA to 50 A.
  - DC Voltmeter measures from 5 mV to 55 V.
  - AC Voltmeter measures from 5 V to 1000 V.
- **Morse Code Translator (GitHub).**
  - Implement a device based on (ATmega32, Touch Sensor) can receive a morse code from the user via the touch sensor.
  - The device converts the entered code into text that is displayed on the LCD.
  - Conversely, the user can enter text using (4*3 Keypad), such as the old phone, and the device will translate it to Morse Code using buzzer beeps.
- **Electric Water Heater (GitHub).**

  Implement Electric water heater based on (PIC, and PICGenios Board) built for Swift Act Company Internship.
- **Hardware Calculator (GitHub).**

  Implement Hardware calculator based on (ATmega32) uses keypad and LCD to perform mathematical operations.