Hanna Nabil Abd El-Shahid

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Personal Information

- Gender: Male
- Age: 23
- The Military Status: Final exemption from military service

Education

- 9-Month Diploma Information Technology Institute Intake 39 Embedded systems track (2019).
- BSc Graduate from Systems and Biomedical Department Faculty of Engineering, Cairo University, Class of July (2013-2018).

  Last year's grade: v.Good

Languages

- Arabic: Mother tongue, English: very good, German

Skills

- **Desktop Development**: C++, C#, Object Oriented Python, Java, JavaFx, PyQt
- **Technical Development:** C, Python, Matlab, SQL, XAMPP, Python Object oriented
- **Web Development:** ASP.NET, RDS, C#, Angular, LoopBack, JavaScript
- **Embedded Systems & IOTSs:** dsPIC33F, ATmega32 AVR, C8051f020 Microcontroller, BASYS2 (VHDL), ESP8266, Arduino, Raspberry-Pi3, STM32F103C8, RTOS
- **Computer Graphics:** OpenGl.
- **Machine learning:** EMG based hand movements classification system.
- **Computer Vision:** Using Python
- **Soft Skills:** self-learning, team work.
- **DSP:** Python, dsPic
- **PCB design :** Eagle
- **Video Editing & Presentation Tools:** Prezi, Camtasia, Powtoon
- **Linux platform:** Ubuntu, Raspbian.
- **Strong command of Git and team workflows.**

Engineering Projects

Most of these Projects are on My GitHub: github.com/HanaNabilAbd
& on My YouTube Channel: youtube.com/c/HannaNabil

Embedded Systems:

- Audio Digital Hearing Aid prototype using dsPIC, electret microphone, earphone
- Designed calculator, traffic light system using BASYS2 (VHDL).
- Designed Piano Using AVR Timer1 & PWM channels to generate square waves at the audio frequencies of the musical notes & Buzzer & UART Peripheral connected to PC youtu.be/I9fBCX8doh4
- Designed Generic Calculator Using Atmega32, EEPROM, LCD, Interactive Keypad to save Results youtu.be/15Sn8HOIp5U

- Optimized (Vectorized) multiplication, using x86 SSE Intrinsics.
- Designed Analog Hearing aid in PCB (Pure Hardware).
- Digital Ruler (transform voltage to distance).
- Playing audio using STM32F1 & SD card, Data from the card is buffered in a FIFO buffer (16 samples)
- Simple Calculator using Assembly.
- Wrote Arabic Names on LCD youtu.be/Hy3_uLi39Ac
- Designed elevator using C8051f020 Microcontroller. youtu.be/RJ-vAkMiL1Y

Design and Implementation of Embedded Based Elevator Control System

- Designed an algorithm for control system of elevator having 7 floors and 2 cabinets controlled with mobile app, Bluetooth Module and IR Sensors, supporting Morse-code for SOS messages using Tiva C

Prototype of CNC Machine:

- Designed and manufactured low cost prototype of CNC machine acts as a 2-D printer using DVD stepper motors. youtu.be/rJxPvV-OUo8

IOT Security Access System:

- Designed a security access system using ATmega32 with 3 modes of access (1- Alphanumeric keypad, (2-mobile app, (3-RFID Security system and QR-Code scanner

Vital Signals Monitoring IOT system:

Designed a real time system based on IOT technology using ESP8266 to monitor vital bio-signals in real-time, analyze and visualize them on web app using XAMPP, desktop app and mobile app, supporting SQL database

Digital Signal Processing (DSP) In Python:

- Designed an Audio Equalizer with Graphical User Interface using python and PyQT.
- Filtration of coming Audio signal by zero and poles graphical manipulation and plotting the Fourier of magnitude and phase in both 2 cases before and after filtration youtu.be/pVqzHzzq30M
- Live Sound Acquisition and Digital audio filter with Graphical user interface. youtu.be/L0CDQk00URU
- Implemented Weiner Filter the Linear Model and made it generic for any Order
- Designed a real-time Digital Hearing Aid using Raspberry-pi3 & PyQt4 for visualizing input & Filtered signals. youtu.be/p_MWyDB-nUw

Web Development (ASP.NET):

- Clinic Management System using SQL and upload data to the cloud (Amazon RDS).

Computer Graphics:

- Modeling robotic arm using OpenGL
- Layout of a simple computer game

Matlab

- Design MRI digital phantom and make it general for any sequence.

Networking (Socket programming) git.io/fjtHC

- Developed an application with: Client-server model, TCP protocol.

Machine Learning

- Passed Online Machine Learning Course Instructed by Andrew Ng at Coursera
- EMG hand movements Classification system

Computer Vision (Python)

- Optical Character recognition (OCR) using Tesseract to recognize: English, Arabic and French Images
- Implemented Canny edge detector, full FAST corner detector.

- Hough transform to detect lines & circles in the image, Superimpose detected circles & lines on the original image.
- Implemented Otsu thresholding algorithm (use minimization of within class variance approach).
- Implemented mean shift segmentation, K-means Segmentation algorithms

Blockchain

Passed all test cases for a task that include real transactions algorithm: git.io/fjLQw

- Execute transactions by signing with private key of user to give an encoded signature.
- Validate transactions using encoded signature and public key of the user
- Generate Pair Key (Public & Private Keys)

Mobile Development

- Designed an Android app for Digital Signal Processing (DSP) using NDK and Superpowered SDK
  - App acquires Audio signal in Real-time and apply Customizable Digital Filters Then output audio Signal in Real-time
  - As sound enters the Mobile microphone, it is broken into multiple frequency bands. Each band is then amplified by the desired magnitude.

Graduation Project

- Computer Vision and Neural Machine Interface for Upper Limb Prostheses.
- I was responsible for Real-time Acquiring of the EMG Signal wirelessly by Bluetooth, designing The GUI using PyQt, machine learning algorithm, Integration of the whole Project on the Raspberry-Pi and Windows Machine.
- Windows Version GitHub: git.io/fjtHm YouTube : youtu.be/_047z4P6DiE
- Raspberry-Pi version GitHub: git.io/fjtHY YouTube : youtu.be/1VjVqUhbCmw

Information Technology Institute (ITI) Projects: [Oct 2018 –Jul 2019]

C Tasks: git.io/fpAuC **[Oct 2018]**

- Multi-Line Editor Using 2-D Dimensional array.
- Employees Menu using dynamic array of structure with 1)New 2) search 3)Exit Items

Java: git.io/fpWQZ **[Nov 2018]**

- Text-Editor NotePad Desktop application using JavaFX, text-Area and HTML-Editor.
- GUI chat room desktop application that also allow user to save messages and open it again.
- Applet that has ability to browse for image, add fonts, print current date, display marque string on it.
- Applet with animated lamp and ball controlled by different threads through buttons.
- Paint program applet that allow user to drag and draw lines.
- Carmeter GPS Project using JavaFX and ShareGPS mobile app: youtu.be/5dTuUQ5fDOY
  GPS interface with a GUI Desktop application (gauges & indicators for showing speed, longitude, latitude), data sent from GPS are parsed by Java and showed in dedicated field on the GUI Map with a marker for the current position which moves while moving. An alarm when exceeding certain limit of speed and stops automatically when the speed is decreased

VHDL: git.io/fp7Yk **[Dec 2018]**

Batch Script: git.io/fpbHI **[Dec 2018]**

Bash Script: git.io/fpAuQ **[Dec 2018]**

- Phonebook using bash script to add, delete, delete all, search contacts git.io/fpAuN
- Password check tool.

- Script when invoked will extract given files, move them to trash and delete files older than 48 hours & the script periodically invoked by Cron daemon.

Matlab: git.io/fpbHI **[Dec 2018]**

- Matlab Coder to generate C code from matlab functions
- Designed matlab GUI for remotely controlled car application

Embedded Linux: **[Jan 2019]**

- Advanced mp3 music box using Buildroot, Bluetooth, Wifi. git.io/fhbzf
- Raspberry-pi based remotely controlled differential drive car.

ROS: git.io/fhpOB **[Feb 2019]**

- Car robot ROS based system using roslaunch 2 nodes run on laptop as a master roscore, and 2 nodes run on raspberry-pi.

Embedded System: git.io/fjkpg **[Dec 2018]**

- Music player using Atmega32, R-2R DAC, LCD, Led-Matrix. youtu.be/SAS5aGizpsY
- Dial system verifier using STM32F103C8, LCD 4 –bit mode, keypad.

Training and activities

- Completed Embedded Systems Course at IMT School instructed by Eng. Ahmed Asaaf (Full diploma, 2018).
- Participated as a judge in Rubo-cup Juniors 2019 at Rescue Maze compition
- Completed Embedded Systems - Shape The World on Edx instructed by Dr. Jonathan Valvano & Dr. Ramesh Yerraballi
- Machine learning Couse on Coursera by the talented Andrew Ng.
- Bioinformatics and Machine Learning Course at Nile University.
- Play oud in Arabic oud house in Hussein
- Trained at El-Agouza Police Hospital
- Summer internship at Kasr Al-Ainy Hospital on hospital systems and management.
- Technical session on sleep lab equipment at MSK.
- Startup experience and an entrepreneurial spirit at Digital Hearing Aid Project
- Moderator at Beat Student Activity