

# Mohammed A. Zaieda

COMPUTER ENGINEERING AND MATHEMATICS UG STUDENT

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## Education

### University of Cambridge, Magdalene College

CAMBRIDGE SECURITY INITIATIVE DIPLOMA

- Grade: B+
- International Security and Intelligence (ISI) Program and Conference

Cambridge, UK

5th. of July 2021 - 30th. of July 2021

### The American University in Cairo

B.S. IN COMPUTER SCIENCE AND ENGINEERING AND MATHEMATICS

- Cum. GPA: 3.8 / 4.0
- Major GPA: 3.7 / 4.0

New Cairo, Egypt

Sep 2018 - May 2023

### The American Creativity Academy

INTERNATIONAL BACCALAUREATE

- Bilingual IB Diploma
- Cum. IB: 34 / 45

Hawalli, Kuwait

Sep. 2016 - May 2018

### The American Creativity Academy

HIGH SCHOOL

- American Diploma
- Cum. GPA: 4.03 / 4.0

Hawalli, Kuwait

Sep. 2014 - May 2018

## Experience

### AUC Material Energy Research Laboratories

DATA SCIENCE RESEARCH ASSISTANT

- Copper based bimetallic carbon dioxide reduction reaction using a machine learning model.
- Performed data analysis on data retrieved from papers for training the model.

New Cairo, Egypt

Mar. 2022 - Present

### Blnk

PART TIME BACKEND DEVELOPER

- Created banking systems and a loan management system.
- Used Django and VueJS to create the admin panel.

Sheikh Zayed, Egypt

Oct. 2021 - Dec. 2021

### Openware Information Systems Consulting Company

FULL STACK DEVELOPER INTERN

- Created a weather application using ReactJS and NodeJS.
- Implemented a global branch locator based on ESRI.

Kuwait City, Kuwait

Jun. 2021 - Aug. 2021

### Grand International Company

MOBILE APPLICATION DEVELOPER INTERN

- Implemented a branch locator application for Zain Tel. Company using Flutter.
- Developed a MySQL database with an admin panel using Outsystems.

Shwaikh, Kuwait

Jun. 2021 - Aug. 2021

### Hérmina Properties

PROPERTY CONSULTANT & REAL ESTATE AGENT

- Contracted with clients for real estate investments.

New Cairo, Egypt

Jan. 2019 - Apr. 2019

## Skills

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| <b>Programming</b> | Python   C/C++   x86-64   MIPS   RISC-V   Verilog (Nexys A7)   STM32 nucleo board   TIVA-C |
| <b>Full Stack</b>  | NodeJS   ReactJS   Django   Flutter   HTML5   CSS3   JavaScript(ES6)   NextJS              |
| <b>Soft Skills</b> | Critical Thinking   Leadership   Teamwork                                                  |
| <b>Languages</b>   | Arabic   English                                                                           |

# Technical Projects

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## Abstractive Text Summarization using Deep Learning

USED GOOGLE'S PRETRAINED TRANSFORMER (PEGASUS-LARGE)

- Performed two types of data augmentation on the XSum dataset.
- Changed the word embedding algorithm to Word2Vec instead of positional sinusoidal embedding.
- Performed hyperparameter tuning.

New Cairo, Egypt

May. 2022

## COVID 19 Crowd Management System

CROWD MANAGEMENT SYSTEM IN LARGE PREMISES TO CONTROL THE NUMBER OF PEOPLE IN THE PREMISE

- Built an embedded system on STM32 nucleo board with multiple sensors.
- Used an ESP32 module along with ThingESP APIs for WhatsApp bot.

New Cairo, Egypt

May. 2022

## Dijkstra's Implementation for Maze Routing

MAZE ROUTING ALGORITHM FOR GDSII PHYSICAL LAYOUT SYNTHESIS

- Written in C and supports up to 100 orthogonal routing layers.
- Applied higher cost for Vias as a way to prevent traversing through layers.
- Nets are adjacent and never intersect with a source, destination, and layer attributes.

Hawalli, Kuwait

May. 2021

## Redundant Fork for Fault Tolerance

PARALLEL FORK - TWO CHILDREN FORK SYSTEM CALL

- Modified the Linux kernel to support a new system call called pfork.
- The pfork forks two children processes and specify one as runnable and the other as standby.
- Modified the core.c, sched.h, fork.c, and exit.c files to finalize the implementation.
- Added attributes in the process control block such as pfork status and pfork process ID.
- Compiled the Linux kernel on a Debian based virtual machine.

Hawalli, Kuwait

May. 2021

## Gender Voice Recognition

MACHINE LEARNING PROJECT TO IDENTIFY THE GENDER OF THE SPEAKER

- Used Tensorflow, Numpy, Pandas, Librosa, and Keras frameworks in Python.
- Created H5 models for the weighted prediction of signal processing.
- Broke down the specifications of each .wav file and measured the natural frequency of the audio file.

New Cairo, Egypt

Apr. 2021

## DFT, IDFT, and FFT Implementation

DIFFERENT FOURIER TRANSFORM ALGORITHMS ON AUDIO WAV FILE

- Applied 128-point DFT on sampled audio file.
- Plotted the real and Imaginary form of the DFT and IDFT.
- Modified the window function to reduce DFT leakage on the polar form.

Dubai, United Arab of Emirates

Mar. 2021

## Tomasulo Simulator

TOMASULO SIMULATOR BASED ON THE CDC 6600 ARCHITECTURE WITHOUT ROB

- Produced the clock cycles needed for each instruction and handled RAW, WAR, and WAW hazards
- Calculated branch mispredictions and handles jump instructions

New Cairo, Egypt

Mar. 2021

## RISCV 32I Processor

VERILOG MODULES GENERATED ON A NEXYS A7 BOARD

- Pipelined RISCV processor of the integer instruction set.
- Hazard detection unit, forwarding unit, and arithmetic operations supported.
- Single memory approach with 5 staged pipeline.

New Cairo, Egypt

May. 2020

## Direct Map Cache Simulator

SIMULATE THE NUMBER OF TOTAL MISSES AND HITS OF DIRECT MAP CACHE

- Produced the total clock cycles and number of memory access and writes.
- Handled misses and hits to sync with clock cycles needed with a graphical interpretation of the expected trend.

New Cairo, Egypt

Apr. 2019

## BIOS Bootloader x86-64

PROGRAMMED A THREE STAGED BOOTLOADER FROM SCRATCH

- Booted from a virtual floppy and virtual hard drive using page table implementation.
- Based on the BIOS firmware with PIC, IDT, and GDT supported.

New Cairo, Egypt

Mar. 2019

## Hooking the Fork System Call

WROTE A ROOTKIT DESIGNED TO REPLACE THE FORK SYSTEM CALL

- Modified the NR Clone entry in the system call table to point to custom method.
- Disabled KASLR and ran the kernel module to replace any fork system calls with a different system call.

New Cairo, Egypt

Feb. 2019

## Extracurricular Activity

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### IEEE AUC Student Branch

CHAIRMAN AND PRESIDENT

- Organized events and assigned tasks to the upper board.

*New Cairo, Egypt*

*Aug. 2021 - Dec. 2021*

### Student Union

INTERNAL OPERATIONS GENERAL MANAGER

- Created admin panels for the SU packs and the SU market.

*New Cairo, Egypt*

*Aug. 2021 - Jan. 2022*

### Vodafone CVM

PRESENTER AND RESEARCHER

- Proposed recommendation for the company to rebound their revenues after COVID-19.
- Created a mathematical and graphical study targeting the main reasons behind the inactivity of clients.

*New Cairo, Egypt*

*Apr. 2021*

### Computer Science and Engineering Association

MARKETING AND MULTIMEDIA DIRECTOR

- Created flyers and banners for events hosted by CSEA.
- Managed a team of graphic designers.

*New Cairo, Egypt*

*Feb. 2021 - Sep. 2021*

### IEEE AUC Student Branch

PUBLIC RELATIONS AND MULTIMEDIA DIRECTOR

- Hosted a Cyber Security event featuring Eng. Bahaa Othman.
- Affiliated with STP Ain Shams for a computer science hackathon.

*New Cairo, Egypt*

*Sep. 2020 - Aug. 2021*

### Model United Nations

DELEGATE

- Participated as an MUN delegate in different commissions.

*Hawalli, Kuwait*

*Sep. 2016 - May 2018*

## Certifications

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- 2023 **AZ-900**, Certified Azure Fundamentals
- 2021 **SCE**, School of Continuing Education Leadership Course
- 2021 **CREH**, Certified Red Hat Network Hacker
- 2021 **CCSP**, Certified Cloud Security Professional
- 2020 **CEH**, Certified Ethical Hacker

*AUC, New Cairo*

*AUC, New Cairo*

*zSecurity, Udemy*

*EHacking.com*

*zSecurity, Udemy*