

Mohamed Hany Afifi

Electrical Engineering Student · **Power Electronics & Embedded Systems**

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PROFILE

I'm a fourth-year electrical engineering student at MUST. I've built a 50 W boost converter and an STM32 motor speed controller, and I wrote Siraj, an Android app that's now in closed beta. I spent 2022–23 on exchange in Turkey and speak Arabic, English and Turkish. I'm looking for an internship in power electronics, embedded systems or industrial automation.

EXPERIENCE

Embedded Systems · MUST Electronics Lab

Summer 2025

6th of October, Egypt

- Wrote firmware for an STM32-based data logger used in a motor-control research project: peripheral drivers in C, UART and I²C debugging, and documentation.
- Built several PIC16F877A projects: a traction elevator controller, a robot driven by remote control or over Wi-Fi, and multi-mode LED circuits.

STM32 · C · UART · I²C · PIC

Freelance Automation & Scripting · Independent, remote

2024 – present

- Python automation for small businesses: web scrapers, file processors and simple dashboards.
- Discord bots for online communities (moderation, levelling, mini-games, an in-server economy), running on live servers.

Python · discord.py · web scraping

Founder & Lead Developer · Obsidian Codex, programming collective

2023 – present

- A group of friends who build software together. I do most of the code reviews and architecture decisions.

SELECTED PROJECTS

Siraj · Android app, closed beta

2026

Offline-first Islamic companion app: prayer times and adhan, a 604-page Mushaf with 34 reciters, Qibla, azkar, fasting and Zakat · [siiraj.vercel.app](#)

- About 102,000 lines of Kotlin in 13 Gradle modules, split into app, core and feature layers.
- Cut the release APK from 126 MB to 32 MB by moving the Mushaf database and 604 page fonts to a resumable first-run download.
- Scheduled the adhan with `setAlarmClock` and an exact-alarm fallback so it fires on time in Doze; the schedule is rebuilt after a reboot, time-zone change or update.
- Available in English, Arabic, Turkish and Urdu, with right-to-left layouts for Arabic and Urdu.

Kotlin · Jetpack Compose · Material 3 · Hilt · Room + SQLCipher · Media3 · WorkManager

Boost Converter, 12 V to 24 V, 50 W · power electronics

Completed

- Sized the inductor ($\approx 150 \mu\text{H}$) for 20 % current ripple and the output capacitor for under 2 % voltage ripple at 100 kHz, in continuous conduction mode.
- Closed the loop with a voltage-mode PI controller in Simulink, tuned it against load steps, then built a prototype and compared its waveforms with the model.

MATLAB · Simulink · PI control · DC-DC

PID Motor Speed Controller · embedded control

Completed

- Closed-loop speed control of a brushed DC motor on an STM32F103 with quadrature-encoder feedback and PWM into an L298N H-bridge.
- Discrete PID with integrator clamping and derivative-on-measurement; settles in under 280 ms with zero steady-state error.

STM32 · C · timers · PWM · encoder

- STM32 samples mains voltage and current with ADC + DMA and computes RMS values, real power and power factor per block.
- Streams results over UART to a Raspberry Pi that serves a Flask dashboard.

STM32 · ADC/DMA · Raspberry Pi · Flask

Also

Line follower robot	IR array and PD control on an ATmega328P, on a PCB I designed in KiCad and soldered.
Three-phase inverter	400 V, 50 Hz VSI with sinusoidal PWM; THD compared across modulation indices with FFT.
Solar MPPT	PV + buck converter in Simulink; perturb-and-observe vs incremental conductance.
Relay coordination	Overcurrent protection for a 3-bus radial network in ETAP, with TCC curves.
PLC conveyor sorting	Sensor-based sorting with e-stop and fault indication, ladder logic in CODESYS.
My Journal	Mood and task journaling app for iOS and Android, live at myjrn.vercel.app .

SKILLS

Power & control	Power electronics (DC–DC, inverters), PID / control systems, power-system protection, PLC (IEC 61131-3, ladder), MPPT
Embedded	C, C++, STM32, AVR, PIC16F877A, ARM assembly, UART / I ² C, ADC + DMA, Raspberry Pi, KiCad PCB design
Software	Python, Kotlin, Jetpack Compose, Java, JavaScript, HTML / CSS, SQL, React, Node.js, Git
Tools	MATLAB & Simulink, LTspice, Proteus, ETAP, DIgSILENT PowerFactory, CODESYS, AutoCAD Electrical, Blender

EDUCATION

B.Sc. Electrical Engineering · Misr University for Science and Technology (MUST) 2022 – present
4th year. Relevant courses: Power Electronics I & II, Control Systems, Digital Control, Electric Machines I & II, Power System Analysis, Protection & Switchgear, Microprocessors, Digital Signal Processing.

Exchange year · Istanbul University (scholarship) and Sakarya University, Türkiye 2022 – 2023
Advanced engineering courses at Istanbul; a semester focused on computer engineering at Sakarya.

High school diploma · Ayn Jaloot Secondary School, Mecca 2019 – 2022
Graduated with 99.3 % · GAT 97 %

TRAINING & CERTIFICATES

Classical Automation · relays, PLCs, factory control
Power Engineering · generation, transmission, protection
Power Electronics · converters, inverters, switching
Python Programming · Udemey
Digital Skills: Developer · Google
Google Analytics · Google
STEM Program · Ministry of Education, KSA

VOLUNTEERING

Serving iftar to fasting worshippers · Masjid al-Haram, Mecca
Türkiye earthquake relief programme · 2023
Food and clothing drives for families in need
Community drives: planting 100 trees, feeding 1,000 people, cleaning 100 streets

LANGUAGES

Arabic	Native
English	Fluent
Turkish	Advanced

OUTSIDE ENGINEERING

Chess (around 1900 Elo), Arabic poetry, 3D modelling in Blender, Minecraft mods, and learning Spanish.