

MOHAMED KHALID ELBAHLOOL

Computer Engineering Senior | Embedded | FPGA | Networked & Production Systems

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SUMMARY

Computer Engineering senior who builds complete systems from physical signals and embedded firmware through FPGA logic, networks, backends, and production interfaces. Shipped bare-metal RP2040 software, exhaustively verified VHDL, and a self-hosted omnichannel retail platform operating in Arabic. Project evidence is documented at mohamedelbahlool.com.

EDUCATION

Florida International University - B.S. Computer Engineering | GPA 3.6 | Dean's List: Fall 2024, Spring 2025

Expected Aug 2027

TECHNICAL SKILLS

Languages: C, C++, Python, TypeScript, VHDL, SQL, HTML/CSS

Networks & systems: TLS WebSocket, REST/webhooks, FastAPI, PostgreSQL, Docker Compose, Caddy

Embedded: RP2040/Pico SDK, PIO, DMA, SPI, I2S, UART, Arduino

Software & verification: Next.js, React, Astro, Playwright, GHDL, Vivado, GitHub Actions

EXPERIENCE

Digital Systems & Automation Specialist - English Home Libya (Remote)

2023 - Present

- Designed, built, deployed, and operate a self-hosted omnichannel platform (TypeScript, Next.js, PostgreSQL, Docker Compose, Caddy) for Facebook and Instagram customer service, content publishing, and multi-admin operations.
- Grounded Libyan-Arabic product replies in a 4,700+ item catalog with photo recognition and human handoff; prices come only from verified catalog data, never model-generated values.
- Implemented durable jobs and a transactional outbox for resumable processing, plus webhook verification, deduplication, send-time guards, authentication, readiness checks, audit trails, and nightly backups.

Learning Assistant II - FIU Mastery Math Lab, Florida International University

Aug 2024 - Present

- Support Algebra, Precalculus, and Trigonometry students about 20 hours/week through mini-lessons, guided practice, and one-on-one tutoring; diagnose misconceptions and explain technical ideas across varied backgrounds.

PROJECTS

NOVA RAID - bare-metal Pico W arcade game C | RP2040 | Pico SDK | 2026 | github.com/lla7wel/nova-raid

- Built a complete solo retro shooter with a dual-core 25 fps design, 62.5 MHz SPI and double-buffered DMA, 24.8 fixed-point math, a desktop HAL test harness, and UF2 releases; fixed a display-init defect exposed only by the first hardware run in v1.0.1.

Pico W voice terminal & self-hosted control plane C | PIO/DMA | Python | FastAPI | 2026 | device repository

- Hand-wired a push-to-talk device with custom 8-instruction PIO I2S capture and a DMA ring buffer; streamed over one TLS WebSocket to a FastAPI control plane with permission-gated tools and a fully offline end-to-end CI test.

Verified digital logic on FPGA VHDL | GHDL | Vivado | Basys 3 | 2026 | adder repository

- Rebuilt coursework as reproducible releases with exhaustive self-checking GHDL testbenches (512/512 adder vectors, 36/36 decoder vectors) in CI, Vivado waveforms, and Basys 3 constraints.

Smart-home appliance controller C++ | Arduino UNO | two-person FIU team | 2026 | repository

- Integrated DHT11 and light sensing, PWM fan control, LCD output, a four-mode state machine, and a 35 °C safety cutoff; contributed to design, firmware, and testing and maintained the repository and schematics.

Miramar - bilingual EN/TR business website Next.js 16 | React 19 | TypeScript | tr-miramar.com

- Designed, built, and deployed solo for an Istanbul construction-materials supplier with typed bilingual content, a selective Three.js scene with static fallback, and Playwright smoke tests in CI.

Human languages: Arabic (native), English (professional fluency), Turkish (professional working proficiency)