

Ziad Ghanem

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EDUCATION

NEW YORK INSTITUTE OF TECHNOLOGY – New York, NY

Master of Science in Electrical and Computer Engineering (Accelerated Program)

Expected **May 2027**

Bachelor of Science in Electrical and Computer Engineering with Honors | GPA: 3.4

May 2026

Awards: 2025 NYIT UREP Innovation Award, Presidential Honor List, Dean's Honor List, Dean's Honors Program

SKILLS

Programming: C, C++, Python, ARM Assembly, Bash

Hardware: STM32, ESP32, MSP430, ATmega328, ARM Cortex-M

Debug/Test: Oscilloscope, logic analyzer, DMM, serial debugging, JTAG/SWD

Tools/Frameworks: FreeRTOS, CMake, GCC, Make, Git, STM32CubeIDE, ESP-IDF, Linux, KiCad, MATLAB

Protocols: SPI, I2C, UART, USB, Wi-Fi, BLE, MQTT

PROJECTS

STM32 Mixed-Signal Instrument | [GitHub](#)

- Built a PC-controlled STM32F407 mixed-signal instrument with a 2-channel AWG, 2-channel oscilloscope, and an 8-channel logic analyzer operating at up to 9.88 MS/s.
- Architected real-time firmware with 4 concurrent DMA streams, four FreeRTOS tasks, timer-triggered acquisition, and USB CDC; synchronized analog/digital capture on a shared timeline with ~ 120 ns measured skew.
- Diagnosed a 20 ms USB round-trip floor as a missing CDC task notification, cutting median command latency to 0.22 ms and increasing throughput 86x to 206 kB/s.
- Built CI-backed verification with 9 host C test suites, 206 Python tests, ASan/UBSan, and scripted HIL validation, reaching 92.8% line coverage on host-testable C sources.

LED Waypoint Compass

- Developed ESP32 C firmware with NimBLE and the Nordic UART Service (NUS) for bidirectional BLE telemetry and command exchange with a mobile app.
- Fused BNO08x IMU quaternion orientation with Haversine distance/bearing calculations to compute real-time waypoint distance and heading.
- Implemented state-driven LED guidance, GPS failover, and NVS-backed configuration persistence across reboots.

Electromagnetic Kinetic 7-Segment Clock

- Designed 3D-printed low-friction rails with N35 magnets and H-bridge-driven electromagnets, using brief switching pulses to actuate sliding display segments.
- Programmed C firmware with font segmentation and XOR-based diffing to actuate only changed segments, reducing switching events by 70%.
- Reduced average display power from ~ 1.25 W for a comparable LED digit to ~ 12.5 mW using bistable magnetic segments and pulse-only actuation.

EXPERIENCE

EEG Researcher | New York Institute of Technology

Sep 2025 - Present

- Developed ESP32-S3 SPI firmware interfacing with the TI ADS1299 to acquire and stream eight 24-bit EEG channels at 250 Hz over USB serial.
- Led firmware/software development on a 3-person team for an EEG acquisition and neurofeedback system, achieving 83% Rest-vs-Task block-classification accuracy with a Random Forest model.
- Built a MATLAB acquisition pipeline for real-time filtering, Welch PSD, artifact gating, visualization, logging, and synchronized task markers.

Technical AI Trainer | DataAnnotation

Jan 2026 - Jul 2026

- Evaluated 200+ AI-generated technical responses across C/C++, Python, and Java and authored 100+ programming prompts/rubrics, identifying edge cases, API misuse, and memory/timing defects.

Software Engineer | Self-Employed

May 2024 - Jan 2026

- Developed Flutter/Firebase applications for healthcare, security, and connected-device clients; integrated AWS IoT over MQTT/HTTP for device telemetry and cloud dashboards.