AMAZING ADELOWO

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EDUCATION

University of Maiduguri **Maiduguri, Borno State, Nigeria**
Bachelor of Engineering (B.Eng.) in Computer Engineering *Expected: 2026/2027*

- **Final-Year Project:** Design and Construction of a Two-Node Infant Cry Detection System with Wearable Caregiver Alert.
- **Relevant Coursework:** Microprocessor Systems, Embedded Systems Design, Digital Electronics & Logic Design, Control Systems, Computer Architecture, Data Communications & Networks, Signals & Systems.

HARDWARE & EMBEDDED ENGINEERING EXPERIENCE

NASCOMSOFT EMBEDED LTD **Bauchi, Nigeria**
Embedded Systems Intern *June 2026 – November 2026*

- Featured in the NASCOMSOFT Student Spotlight for hands-on project contributions and supporting intern hardware teams.
- Simulated circuits in Proteus (microcontrollers, LCDs, motor drivers, logic) to check pinouts and power limits before breadboarding and veroboard assembly.
- Built and tested wireless sensor nodes using RA-02 LoRa (sub-GHz) and SIM800L GSM modules for remote data telemetry and automated SMS alerts.
- Designed circuit schematics and wrote C/C++ firmware for municipal automation rigs: an ATmega328P dual-LDR streetlight controller with relay switching, and an automated soil-moisture irrigation rig.
- Assembled 4ft × 1.5ft outdoor P10 LED matrix display boards; wired 5V/4A power supplies, balanced current draw across panels, and routed bus lines.
- Inspected and troubleshooted prototypes using multimeters and oscilloscopes to check logic voltage levels, PWM switching, and power rail noise.

TEAM RAMP (NASCOMSOFT EMBEDED LTD Annual Hackathon) **Bauchi, Nigeria**
Product Manager & Hardware Engineer *August 2026 – October 2026*

- **Won 1st Place Overall (Grand Winner)** among all competing hardware and software teams for developing AttendX, an IoT biometric staff attendance terminal.
- Coordinated the 4-person team, structured product deliverables, and co-designed the terminal hardware and finale presentation.
- Built the physical terminal using an ESP32-S3-CAM, an SFM-V1.7 capacitive fingerprint module, an I2C 16x2 LCD, and a 4x4 keypad inside a 3D-printed enclosure.
- Wired an automatic camera snapshot fallback that triggers whenever an employee clocks in via keypad PIN instead of fingerprint, preventing proxy attendance.
- Troubleshooted late sensor delivery 2 days before the finale, verifying UART communication and power rails to deliver a working physical demo to the judges.

HARDWARE & EMBEDDED PROJECTS

Two-Node Infant Cry Detection System with Wearable Alert **2026**
ESP32-S3 Hub · 2× ESP32-C3 + INMP441 Audio Nodes · Haptic Wearable · BLE · INT8 On-Chip *Final-Year Capstone Project*

- Built a two-node cot-side cry monitor end to end — two ESP32-C3 + INMP441 audio nodes, an ESP32-S3 hub (16 MB flash / 8 MB PSRAM), and a haptic caregiver wearable — with the 135 KB INT8 neural network running entirely on-chip, so no cloud sits in the alert path (github.com/Amazo123/CryNet-TwoNode).
- Measured **test AUC 0.9993 (INT8)** and **0 false alarms across 308 non-cry bench windows** (speech, music, film, quiet); all 45 demo alert bursts arrived complete — no stalls, timeouts or CRC errors.
- Hand-wrote the log-Mel DSP front end twice — C for the chip, Python for training — and verified parity: max deviation 7×10^{-5} on the host, ≤1 LSB on-chip across the 5,184-feature chain.
- Derived the alert policy from bench data: an adaptive 3× noise floor (a cry at 1 m never crossed the fixed trigger — 0/590), an announcement-gap rule (26 alerts at P(cry) ≥ 0.99 vs 16 refusals ≤ 0.21, nothing in between), and a clipping guard (windows ≥31,000/32,767 refused) after a clipped recording made the hub name the wrong cot for 42 s.

- Powered the wearable from a 3.7 V Li-ion pouch cell with TP4056 charging, BLE alerts driving an ERM haptic through a BC547 low-side switch — validated on a cell-powered bench run.

Biometric E-Voting Machine with Cloud Sync **2026**

ESP32, AS608 Optical Fingerprint, 16x4 LCD, 4x4 Keypad, Neon PostgreSQL, Render *Lead Hardware Developer*

- Built a standalone voting machine with fingerprint authentication and local hardware checks to stop duplicate voting.
- Connected an AS608 optical fingerprint reader to an ESP32 over UART, adding decoupling capacitors to prevent brownout resets during optical scans.
- Built an interactive menu on a 16×4 LCD and 4×4 keypad that paginates through 20 political party choices using navigation keys.
- Sent live vote tallies over Wi-Fi to a Render-hosted dashboard backed by a Neon PostgreSQL cloud database.

Swarm Robotics Fleet with Electromagnets & Motor Calibration **2026**

ESP32, L298N Motor Drivers, Logic-Level MOSFETs, Buck Converters, Python *Hardware & Robotics Engineer*

- Built three mobile robots carrying downward-facing electromagnets to pick up and transport metal plate payloads.
- Used L298N dual H-bridge motor drivers and step-down DC-DC buck converters to power ESP32 boards cleanly from battery packs.
- Wired logic-level MOSFET switches with flyback protection diodes to drive the electromagnets from ESP32 GPIO pins.
- Tuned motor PWM values in code to correct for physical differences between DC motors, keeping robots driving straight.

Autonomous Obstacle-Avoidance Robot (Veroboard Build) **2026**

ATmega328P DIP-28, HC-SR04 Ultrasonic, L298N, DC Motors, Veroboard Soldering *Hardware Prototyper*

- Built an autonomous obstacle robot from scratch on veroboard by soldering an ATmega328P DIP chip, 16MHz crystal, capacitors, and an L298N motor driver without an Arduino board.
- Connected an HC-SR04 ultrasonic sensor with a 20 cm trigger limit to detect walls and obstacles.
- Wrote motor control code to stop one wheel and turn the other when an obstacle is detected, steering the robot away cleanly.

Remote-Controlled Hazard-Detection Vehicle **2026**

Arduino Nano, ESP32-CAM, HC-SR04 Ultrasonic, L298N, Bluetooth *Embedded Hardware Developer*

- Built a 4-wheel drive vehicle with directional obstacle interlocks using front and rear ultrasonic sensors.
- Programmed control logic that blocks forward movement when a front obstacle is detected while still allowing the vehicle to reverse or turn, and blocks reverse movement when an obstacle is behind.
- Mounted an ESP32-CAM running an on-device machine learning model to spot road hazards like potholes and puddles, triggering a warning buzzer.
- Interfaced an Arduino Nano with an L298N motor driver and Bluetooth module for smartphone teleoperation.

LEADERSHIP & ACTIVITIES

Centre for Embedded AI & Smart Energy Systems (CEAISES) & ATBU **Bauchi, Nigeria**

Robotics & Electronics Volunteer Instructor *August 2026 – September 2026*

- Taught young students basic electronics, breadboard wiring, and sensor interfacing (ultrasonic, IR, servos) in a 4-week camp.
- Mentored Group Six through building and programming an obstacle-avoiding robot, winning **1st Place in the Grand Finale Maze Race**.

SKILLS & INTERESTS

Hardware & Prototyping: Schematic Design, Circuit Simulation (Proteus), Breadboarding, Veroboard Soldering, Oscilloscopes & Multimeters, Power Budgeting, Component Sourcing.

Microcontrollers & Processors: ESP32 (ESP32, S3, C3 SuperMini, CAM), ATmega328P, Arduino (Uno, Nano), Raspberry Pi (Linux/SSH).

Sensors, Actuators & Power: SFM-V1.7 Capacitive & AS608 Optical Fingerprint, INMP441 (I2S), MPU6050, Ultrasonic (HC-SR04), PIR, DC Motors, L298N Drivers, Servos, Electromagnets, Relays, Buck Converters, TP4056 Li-Ion Chargers, Solar Panels.

Protocols & Buses: I2C, SPI, UART, I2S (Digital Audio), GPIO, PWM, ADC/DAC.

Wireless & IoT: Wi-Fi, Bluetooth / BLE, LoRa (RA-02), GSM (SIM800L), GPS.

Software & Programming: Embedded C, C++, Python, Git, GitHub, SQL basics, on-device ML (INT8 quantisation).

Interests: Embedded automation, robotics, circuit design, hackathons, football.