

(WISDOM) AWELE CHIEKWENE

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Analog & Digital Circuit Design | Sensor Technology | Electrical Hardware Design | Embedded Systems

SUMMARY

Electrical Engineering student specializing in sensor-based hardware design and embedded systems, with PCB design, analog sensing circuits, serial protocols, and real-time fault detection across 3 active hardware projects. Conducting electrochemical sensor characterization in two university research labs simultaneously. Building toward a career in autonomous systems and hardware where sensor technology, circuit reliability, and embedded intelligence intersect

EDUCATION

GRAMBLING STATE UNIVERSITY

Electrical Engineering Major, Drafting-Design Engineering Major (Mechanical Engineering)

May 2028

GPA: 3.87

TECHNICAL SKILLS

Circuit & PCB: Analog Circuit Design, Digital Circuit Design, PCB Design, Component Selection, LTspice, Soldering, Circuit Analysis
Serial Protocols & Embedded: I2C, UART, SPI (Foundational), Python, C++, Arduino, ESP32, Firmware Development, Real-Time Systems
Power & Sensing: Motor Control, Sensor Interfacing, EIS Testing, I-V Analysis, Oscilloscope, Multimeter, Signal Verification
Design & Documentation: AutoCAD, Inventor, Technical Writing, Test Documentation, OpenCV, MediaPipe

PROJECTS

Motor Fault Detection System – Multi-Sensor Protection Unit | (IN PROGRESS)

- Building a multi-sensor motor protection unit that continuously watches for abnormal electrical and physical behavior and triggers automated safety responses (Designed with motor controllers and autonomous hardware integration in mind as a standalone fault monitoring module)
- Implemented a voltage anomaly detector as the first sensing input which feeds the microcontroller ADC, samples every 100ms and flags out-of-range readings against configurable thresholds; validated automated shutdown response in simulation with confirmed trigger delay under 500ms
- Expanding the sensor suite in active development: adding an NTC thermistor for overtemperature detection, an ACS712 current sensor for overcurrent fault identification, and an MPU-6050 accelerometer for abnormal vibration signatures.
- Designed the state machine in C++ with three operating states (NORMAL, WARNING, FAULT) where each sensor input can independently trigger a state transition; the architecture is built so additional sensors can be added as new input channels without restructuring the core logic

ASL to Morse Code System – Electromechanical Signal Interface | Spring 2026 (UPGRADING)

- Building a real-time assistive interface system that reads hand gestures and text from a live camera feed and converts them into physical Morse code signals on hardware
- Implemented the computer vision pipeline in Python using MediaPipe for hand landmark detection and Tesseract OCR with OpenCV for live text recognition
- Building and testing the Arduino hardware output stage; selected output components, wired the signal circuit, and writing firmware to parse incoming serial bytes and drive the physical Morse code response in real time

DWIPS – Wearable LIDAR Obstacle Detection System | Fall 2025 (IN PROGRESS)

- Developing a wearable assistive device that uses LIDAR to detect nearby obstacles in real time and alert the user, intended to support people with visual disabilities or low visual attention in navigating their environment safely
- Leading embedded firmware development in C++ on the ESP32; wrote the UART driver to communicate with the LIDAR sensor, and developed threshold-based proximity detection logic that classifies objects by distance zone and triggers the appropriate alert response
- Currently in the sensor testing and calibration phase; characterizing the LIDAR's detection accuracy, response time, and behavior across varying surface materials and lighting conditions to establish the reliable operating envelope before finalizing firmware thresholds
- Designed the hardware layout for the wearable form factor, managed component placement for the ESP32, LIDAR module, power regulation, and output circuitry with size and wearability constraints in mind;
- Solely responsible for the 3D CAD model of the physical enclosure; designing the wearable housing in Inventor to fit all internal components, accommodate the LIDAR's field of view, and produce a form factor suitable for 3D printing and user testing

EXPERIENCE

UNDERGRADUATE RESEARCH FELLOW - ELECTRONICS MATERIALS & CHARACTERIZATION

Louisiana Technology University | Ruston, LA | March 2026 - Present

- Run EIS, LPR, and cyclic polarization tests weekly to characterize how materials behave electrically under sustained stress
- Identified 3 repeatable electrical failure signatures through impedance tracking over time; findings now used as early-warning criteria in material selection, mirroring the DFMEA process for electronic components

SIGNAL VALIDATION & TEST ENGINEER INTERN

GSU Technical Operations Center | Grambling, LA | Jan 2025 - Present

- Designed and implemented a 6-checkpoint hardware validation protocol for signal-distribution electronics; reduced live system failures by 26% across 28+ national broadcasts and eliminated fault callbacks for 3 consecutive months after rollout
- Diagnosed analog and digital signal failures across a 6-device hardware chain using an oscilloscope (traced signal integrity issues at the circuit level and cut diagnosis time from hours to under 20 minutes)
- Coordinated a 9-person technical crew through multi-system hardware integration under live broadcast deadlines; maintained clear documentation of system configuration and test results for each event.

DESIGN & MAKE AMBASSADOR

Autodesk | Grambling, LA | Jun 2025 - Present

- Pitched Autodesk tool adoption directly to department leadership with a structured proposal covering resource requirements; secured official approval for AutoCAD and Inventor to be adopted into the electronics engineering curriculum, reaching 100+ students annually.
- Ran 3 hands-on build-and-test hackathons where 68 students across disciplines designed and validated real hardware against defined targets