

ESABU BLESSING OBEHI

Hardware Engineer

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Summary

Computer Engineering student with hands-on experience in embedded systems, FPGA development, sensor integration, and 3D mechanical design. Skilled in VHDL, C/C++, Arduino, and CAD, with project work spanning DSP, IoT health hardware, radar systems, and precision modelling. Active IEEE member with competition experience, seeking a hardware engineering internship.

Technical Skills

Core Competencies: Embedded Systems Design, FPGA Programming (VHDL), Circuit Analysis & Design, Sensor Integration & Interfacing, 3D Modelling & CAD, 3D Printing & Prototyping, Robotics & Control Systems, Digital Signal Processing, PCB Design Fundamentals.

Microcontrollers Arduino, ESP32, Raspberry Pi

FPGA / HDL DE10-Lite (Intel Altera); VHDL, Verilog

Languages C, C++, Python, MATLAB

CAD / 3D Autodesk Fusion 360, Autodesk Inventor, TinkerCAD, Bambu Studio

Sensors MAX30102, Thermistor, HC-SR04 Ultrasonic, Servo

Experience & Community

Chip Design Trainee

March 2026 – May 2026

NITHub, University of Lagos — IEEE & NITHub Silicon Workshop

Lagos, Nigeria

- Hands-on digital IC design: RTL design in Verilog, synthesis, and the RTL-to-GDS flow, alongside lab instrumentation, PCB fundamentals, and embedded hardware in the NITHub makerspace.

Hardware Engineering Trainee

2025 – Present

BotsHub UNILAG

Lagos, Nigeria

- Student robotics and embedded-systems team; completed Arduino and TinkerCAD circuit-simulation training and built first two hardware projects through the programme.

Hardware Projects

Load Priority Controller (Tiny Tapeout SKY130 ASIC)

Verilog · LibreLane · cocotb

- Co-designed an FSM-based load priority controller in synthesizable Verilog that performs deterministic load shedding and power allocation across three prioritised loads under varying power constraints, currently being fabricated through Tiny Tapeout (IEEE Open-Silicon Initiative) on the SkyWater SKY130 process.
- Verified with a cocotb testbench and carried through the full RTL-to-GDS flow with LibreLane. Code: github.com/Tech-sis123 (repo: IEEE_Open-silicon_initiative_Load_Priority_Controller).

CardioTwin AI — Cardiovascular Screening Station

MAX30102 · Thermistor · ESP32 · Cloud

- Hardware interfacing team member (Team BitNomads): integrated the MAX30102 pulse oximeter and thermistor to capture HR, HRV, SpO2, and skin temperature from a fingertip station.
- Ensured reliable sensor-to-cloud data streaming under an end-to-end encrypted, NDPR-compliant architecture feeding a real-time CardioTwin risk score.

Twin Radar System — Object Detection & Visualization

Arduino · HC-SR04 · Servo · MATLAB

- Built the full hardware layer of a rotating radar: servo + ultrasonic sensor on Arduino with C firmware for sweep control and distance measurement, tracking objects across a 180° arc.
- Streamed live distance data to a MATLAB polar plot. **2nd Place**, UNILAG IEEE Week IES Hardware Competition (IEEE Nigerian Section).

Naijawatt Monitor — Smart Energy Usage Tracker

Arduino · Sensors · MATLAB

- IAS Girls team smart-energy monitor with predictive usage alerts; integrated sensing for power-consumption tracking with visualization and alert logic. Submitted as an IEEE IAS design project.

Moving Average Filter — FSM-Based DSP on FPGA

DE10-Lite · VHDL · Intel Altera

- Implemented a 3-tap running-average DSP filter as a finite state machine in VHDL on the DE10-Lite — onboard registers for delayed samples, switch input, and seven-segment output.

Helical Gearbox — 3D Mechanical Design

Autodesk Inventor · Fusion 360 · Bambu Studio

- Designed and modelled the gear-head component for a team helical gearbox; 3D-printed the cover from Bambu Studio-sliced G-code into a functional assembly prototype.

CAD & Mechanical Design

- Modelled mechanical components in Inventor and Fusion 360 with assembly drawings and print-ready files — helical gearbox, bench vice, clamp, cable roller, caster wheels — exporting Bambu Studio G-code for FDM 3D printing.

Education

B.Sc. Computer Engineering

Expected 2029

University of Lagos (UNILAG) | CGPA: 4.61/5.0 (First Class)

Lagos, Nigeria

- Relevant coursework: Signals & Systems, Circuit Analysis (EEG 211/231), Introduction to Electrical & Electronics Engineering.

Competition & Recognition

- **2nd Place** — UNILAG IEEE Week IES Hardware Competition (IEEE Nigerian Section) Nigeria Hackathon
- **1st Place** — CJID
- **2nd Place** — Curacel Hackathon
- **3rd Runner-Up** — LCCI Hackathon

Certifications & Affiliations

- **Career Essentials in Generative AI** — Microsoft & LinkedIn
- **IEEE Member** — Robotics & Automation Society, Industrial Electronics Society, Industrial Applications Society (IAS-IPCS design participant); IEEE & NITHub Silicon Workshop.

Leadership & Community

- **Founder**, Unilag Female Engineers '29 — community and mentorship for women in engineering at UNILAG.
- **Vice Secretary**, IEEE UNILAG Student Chapter — operations and administration.