

RICHMOND YEBOAH APPAU-SIAW

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EDUCATION

Jan 2022 - Nov 2025 **Bachelor of Science, Computer Science**
Kwame Nkrumah University of Science and Technology (KNUST) GPA: 3.09/4.0
Undergraduate Thesis: A Smart IoT System to Monitor Electricity Use and Prevent Power Waste and Theft in Ghanaian Schools, Homes, and Markets [[View Prototype](#)]
Research Interests: Embedded Systems || Multimodal Sensor Electronics || Wireless Sensor Network || AI-Enabled Environmental Sensing || IOT Systems || Autonomous Robots System (UAV, Water & Land Vehicles)

RESEARCH EXPERIENCE

Sept 2025 - Present **Embedded Systems Lab, Department of Computer Science-KNUST**
Research Assistant
Title: Environment-Aware Sensing of Solar Energy Generation Using a Multimodal Embedded Sensor Node

- Built a multi-sensor node using voltage, current, temperature, humidity, and cloud/light sensors on one controller to link environmental conditions to solar panel output across seasons.
- Collecting and analysing seasonal data to model how environmental factors affect energy generation.
- Applied multimodal sensor integration, low-power embedded design, and real-time data acquisition using ESP32 and Raspberry Pi.

Nov 2024 - Nov 2025 **Embedded Systems Lab, Department of Computer Science-KNUST**
Research Project Lead (Final Year Project)
Title: An AI- and IoT-Based Smart Energy Meter for Remote Appliance Monitoring and Electricity-Loss Prevention

- Designed an intelligent energy meter using current sensing on power lines to study energy loss, heat dissipation, and overload risk as high-consumption appliances near a line's threshold.
- Integrated embedded systems, sensor data processing, and cloud connectivity for remote monitoring and control of appliances.

Nov 2023 - Present **Innovation Center, College of Engineering-KNUST**
Independent Researcher
Title: Sensor-Based Assessment of Environmental Conditions on the Growth of Short-Cycle Vegetable Crops.

- Studying how environmental factors (temperature, humidity, soil and moisture) affect the growth of short-cycle vegetable crops through sensor data acquisition and analysis.
- Designing low-cost sensing and IoT dashboards to support data-driven agricultural decisions.

Feb 2023 - Present **Innovation Center, College of Engineering-KNUST**
Research Contributor
Title: Computer-Vision-Based Early Crop-Disease Detection for Precision Agriculture

- Developing an AI-powered aerial imaging pipeline (Lenz) that uses computer vision to detect crop disease early, cutting chemical use and giving farmers free crop-health insights.
- Focused on responsible, low-cost AI deployment for resource-constrained farming communities.

POSTER EXHIBITION & ORAL PRESENTATIONS

Appau-Siaw, R. Y., Andoh, F., Ackah, D., Arthur, F., Darkwah, C., Kornyo, O., & Asamoah-Wiredun, D. (2026). Smart Energy Monitoring System: An Integrated IoT Solution for Reducing Electricity Waste, Overload Losses and Power Theft in Ghanaian Schools, Homes and Markets. (Oral Presentation, Russian-African Forum of Young Scientists: “Future Engineers of the World – The Foundation of Sustainable Development,” 2026). Track 1: Energy of the Future.

Amanfo, J. O., Kornyo, O., Appau-Siaw, R. Y., et al. (2025). A Low-Cost Multimodal Assistive Robotic Arm with Local-Language Voice Control for Upper-Limb Disability Support in Ghana. (Poster Presentation). [[Link To Poster](#)]

TEACHING & MENTORSHIP EXPERIENCE

Sept 2025 - Present **Teaching Assistant - Kwame Nkrumah University of Science and Technology (KNUST)**

- Assist in teaching AI and Embedded Systems; lead hands-on embedded systems projects, and assess students through practical projects.

Sept 2025 - Present **Part Time Lecturer - Garden City University College**

- Teach Introduction to Robotics and Embedded Systems; develop course materials, lead hands-on Arduino platform and Onshape projects, and assess students through examinations.

Feb 2022 - Present **Lead STEM Facilitator and Technical Director - Firefly IO**

- Lead the development and delivery of STEM and robotics programs, mentor students in practical learning, and also design robotic solutions and toolkits (XploreBot). [[Video](#)]

Jan 2024 - Feb 2025 **Embedded Systems Designer and Tutor - IoT Network Hub**

- Designed and developed embedded systems using ESP32, Arduino, and Raspberry Pi; wrote and tested firmware in C/C++ and Python and trained community members.

- Nov 2024 - Aug 2025 **Technical Coach - Ghana Science and Tech Explorer Challenge Prize (GSTEP)**
- Mentored JHS students in STEM through hands-on innovation projects addressing real community challenges.

CONFERENCES & EVENTS

- Nov 2025 - Nov 2025 **Presenter (Young Entrepreneur), Next Generation Digital Action (NGDA) - Denmark**
- Represented Team RAVen (Campus drone delivery system) among 18 selected startups across 11 countries.
- Jul 2025 - Jul 2025 **Panelist, ARISE (IEEE) - KNUST, Ghana**
- Discussed how robotics, AI, IoT, and intelligent sensing can drive Africa's development, with a focus on gender equity in STEM and creating opportunities for young innovators.
- May 2025 - May 2025 **Presenter (Youth Innovator), Evidence for Development (Evi4Dev) Conference - Kenya**
- Spoke as a youth innovator on how evidence and youth-led innovation can shape policy decisions that support young African innovators in STEM.
- Jun 2025 - Jun 2025 **Participant, Ghana Data Science Summit - Ashesi University, Ghana**
- Focus on applied machine learning, computer vision, and responsible AI.

LEADERSHIP & VOLUNTEERING

- Nov 2018 - Present **Founder & Chief Executive Officer, RichTechWorld**
- Founded and lead a STEM innovation company building technology solutions and empowering young Africans through STEM education, robotics, and AI.
- Jan 2023 - Sep 2025 **Robotics Instructor (Volunteer), College of Science Robotics Club, KNUST**
- Trained and mentored students in robotics, embedded systems, and Arduino programming, and supported STEM capacity-building activities.
- Feb 2024 - Present **Child Online Protection Awareness Volunteer**
- Deliver awareness sessions educating parents, students, and communities on child online safety and protecting children from digital threats.
- Jan 2020 - Jan 2021 **Vice President, Robotics Club, Adisadel College**
- Organised training sessions for students and led teams in robotics competitions including the FIRST LEGO League and the Renewable Energy Challenge.
- Jan 2020 - Jan 2021 **Lead Hardware Engineer, Science Club, Adisadel College**
- Contributed to science education activities and student engagement, supporting science projects and competitions.

HONORS & AWARDS

- 2025 **Silver Award**, China International College Students' Innovation Competition, Africa Division [[Award Link](#)]
- 2025 **Outstanding Innovation Award**, Presidential AI & Robotics Competition, Elevate AI Africa [[Award Link](#)]
- 2023 **1st Place (Stars League)**, Ghana Robotics Competition
- 2021 **Activities Award**, FIRST LEGO League Virtual Open International, Greece [[Award Link](#)]
- 2021 **2nd Place**, Regional Renewable Energy Challenge, Ghana Energy Commission [[Award Link](#)]

RELEVANT SKILLS

- **Programming & Software:** Python/MicroPython, C/C++, Java, VB, Embedded Software Development.
- **Robotics & Embedded Systems:** Microcontrollers (Arduino, ESP32, Raspberry Pi), Sensor Integration & Data Acquisition, Actuator Control, PCB Design & Testing, IoT System Design, Wireless Communication (Wi-Fi, Bluetooth, GSM, LoRa), 3D Design & Printing, AutoCAD, Autonomous & Drone Technology.
- **Platforms & Tools:** Cloud/IoT Dashboards (MQTT, Firebase, Adafruit IO), Database Design & Management, Microsoft Office Suite.
- **Professional:** Leadership, Team Management, Technical Communication, Public Speaking, Mentoring, Documentation.

PROJECTS

- **Autonomous Delivery Drone (RAVEN):** An autonomous delivery drone built on the PX4 and ArduPilot flight stacks with a Pixhawk controller, using Python (MAVLink) for GPS waypoint navigation and autonomous takeoff and landing. Silver Award, China International College Students' Innovation Competition (Africa Division) [[Demo Link](#)].
- **Smart Energy Monitoring System:** An ESP32-based IoT energy meter that measures real-time power usage with current and voltage sensors and sends readings over MQTT to a Firebase dashboard for remote monitoring [[Demo Link](#)].
- **MindBot, AI-Powered Virtual STEM Learning Platform:** An AI learning platform with a GPT-based tutor, built-in code compilers, and virtual simulators for robotics and electronics; in live pilot across multiple schools [[Webapp Link](#)].
- **Smart Cane for the Blind:** An assistive Arduino cane using ultrasonic sensors to detect obstacles and alert the user through vibration and sound [[Demo Link](#)].
- **Waste Segregation Bin:** A Raspberry Pi waste sorter using a computer-vision model (TensorFlow Lite) to identify and separate plastic, metal, and organic waste through a camera and servo mechanism
- **An AI-powered precision agriculture drone (Lenz):** built on the PX4 and ArduPilot flight stacks with a Pixhawk controller, using Python (MAVLink), OpenCV, and a YOLO-based computer vision model for real-time crop disease detection, GPS waypoint navigation, precision pesticide spraying, and autonomous takeoff and landing [[Demo Link](#)].